# **Project Dissertation Report on**

# Internal Factors Affecting Sales of a Multichain Retail Store

**Submitted By** 

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(2K20/DMBA/41)

**Under the Guidance of** 

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# **CERTIFICATE**

This is to certify that **Dibakar Das** has submitted the project report titled **Internal Factors Affecting Sales of a Multichain Retail Store** in partial fulfillment of the requirements for the award of the degree of Master of Business Administration (MBA) from Delhi School of Management, Delhi Technological University, New Delhi during the academic year 2021-22.

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**DECLARATION** 

It is hereby certified that the work which is being presented in the MBA Major Project Report

entitled " Internal Factors Affecting Sales of a Multichain Retail Store " in partial

fulfilment of the requirements for the award of the degree of Masters of Business

Administration of Delhi School of Management, New Delhi (Affiliated to Delhi

Technological University, Delhi) is an authentic record of our own work carried out during

a period from January 2022 to May 2022 under the guidance of Dr. Sonal Thukral,

Assistant professor. The matter presented in the MBA Major Project Report has not been

submitted by me for the award of any other degree of this or any other Institute.

Any academic misconduct and dishonesty found now or in future in regard to above or any

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situation, I understand that a strict disciplinary action can be undertaken against me by the

concerned authorities of the University now or in future and I shall abide by it.

**DIBAKAR DAS** 

Roll No: 2K20/DMBA/41

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### **EXECUTIVE SUMMARY**

The major competition of multichain retail stores came from retail giants such as Reliance Fresh, Big Bazaar and Spencer. Also, the recent entry of Walmart into the Indian retail market posed serious challenges as the competitive landscape was heating up.

The advent of online grocery shopping and its rising popularity owing to the convenience and array of shopping options also added to the challenges which stood ahead. Grofers, which was a low-price online supermarket present across 25 cities and Big Basket, which was known for its fresh fruits, vegetables, pulses, spices and beverages were enjoying an exponential increase in their customers.

Whether start-ups or established retail stores, all brands were aggressively expanding their outlets within the country across Tier- I, Tier- II and Tier- III cities offering customized products and prices depending upon the location of the retail store. In times of such a highly competitive environment in the grocery retail industry, most retail chains looked to offer a point of differentiation which would help them garner more customers over the competitors.

Therefore, there is need to analyze the factors that attracted the customers to the retail stores so they could position themselves accordingly for their existing and prospective customers. This research can help stores in increasing their sales by modifying the in-store experience of the outlets along with an understanding of the optimum size and location of the stores.

Reliable retail sales prediction of all types of stores can not only help in making correct inventory purchase decisions but also in determining which new products to be launched.

Therefore, the main aim of this paper is to propose an enhanced method based on stepwise regression and descriptive modelling of the predetermined data to forecast the retail sales of a multi-chain grocery store in different locations. The factors include item visibility, size of store, type of products, MRP of products, establishment year, weight of products, fat content of products, type of store.

The research findings in this paper indicate that display location and other variables affect the sales of a multi chain grocery store. The data, together with necessary information collected in the same study, help in determining insights into supermarket shopping behavior and suggests ways on how merchandising efficiency might be improved.

One of the most difficult decisions a retailer makes is to determine the location of the store. As nowadays convenience is so important to the consumers, a retail store can grow or decline solely depends upon its choice of location. Therefore, the research will also be performed indicating which type of store should be opened in which location.

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#### **CHAPTER 1: INTRODUCTION**

### 1.1 Background

In this globalization era, the market is enormous and the businesses has more competitors. In order to attract consumers and compete with competitors in the market place, the grocery business adopts several marketing tools and strategies. The increasing competition in the global market has motivated organizations to be determined and ensure planning effectively and efficiently than other competitors.

Philip Kotler believed that, "Retailing includes all the activities involved in selling goods or services to the final consumers for personal, non-business use. Any organization selling to final consumers whether it is a manufacturer, wholesaler or retailer – is doing retailing. It does not matter how the goods or services are sold (by person, mail, telephone, vending machine or internet) or where they are sold (in a store, on the street or in the consumer's home)."

For many years, the academic fraternity and retail professionals have been engaged in research activities in various fields of retailing. The major area of research is on the involvement of shoppers in purchasing. India's food and grocery retail are the most attractive segment in the world and accounts for 60% of total revenue in retail sector, followed by the apparel segment (Deloitte, 2013). For many years, the academic fraternity and retail professionals have been engaged in research activities in various fields of retailing. The major area of research is on the involvement of shoppers in purchasing.

India's food and grocery retail are the most attractive segment in the world and accounts for 60% of total revenue in retail sector, followed by the apparel segment (Deloitte, 2013). For many years, the academic fraternity and retail professionals have been engaged in research activities in various fields of retailing.

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"According to a McKinsey report, the share of an Indian household's spending on food is one of the highest in the world, with 48% of income being spent on food and beverages" (Mittal and Parashar, 2010). The unorganized (Kirana) retailer and grocers holds up to 60% of market share, which forces many big industrialists like Future Group, Reliance, and Spencer's to start investing in retail sector also. Although organized food and grocery is the second largest category, it holds only 11% of the market share in organized retail market after apparel segment (Deloitte, 2013). This can be one of the main backdrops for the modern retail in India.

The major reason for the dismal performance can be ascribed to the fact of blindly following and replicating the westernized format in India without considering the abysmal differences in all types of macro and micro environmental factors (Mittal and Parashar, 2010).

Economic value add¹ of publicly traded grocery retailers,² \$ billion 11.5 11.3 11.1 10.1 9.8 8.6 8.0 -54% 6.9 6.0 5.6 5.3 6.7 5.5 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017

Figure 1: Source: McKinsey Corporate performance Analysis Tool

#### 1.2 Problem Statement

This paper will propose an enhanced method based on stepwise regression and descriptive modelling of the predetermined data to forecast the retail sales of a multi-chain grocery store in different locations. The factors include item visibility, size of store, type of products, MRP of products, establishment year, weight of products, fat content of products, type of store.

#### 1.3 Objectives of Study

- (1) To identify the factors responsible for outlet sales.
- (2) To identify the location should encourage which type of store.
- (3) To analyze if shelf spacing helps in increasing sales?
- (4) To determine what type of inventory to be ordered.
- (5) To find which type and size of store generate more sales.

### 1.4 Scope of Study

Customers nowadays desire to anything, anywhere and at any time, that also in minimum prices. Today people have high expectations. In a UK based survey, people said they prefer healthier food choices when compared with regular ones. They also wanted to be aware of how exactly food comes from and how is it prepared; they also expect companies to be responsible towards environment and society. At the same time, they demand deals and discounts and choose option that provides minimum price and best quality. Finally, they are nowadays more attracted towards the seamlessness and convenience of online shopping. The retailers and organized grocers (Kirana) therefore finding difficult to meet customers' expectations of low price and high quality of product. Other type of retailers have entered in the market as the unorganized sector couldn't adapt changes, some of them includes discounters, convenience store chains and online retailers. Consumer packaged-goods (CPG) manufacturers also stepped in and began selling products directly to the customers.

Discounters are the most highlighted ones. Schwarz Group, which owns discounters Lidl, is now one of the Europe's biggest food retailers. ALDI and Lidl are trying to establish their foot in the US market as well. With the controlled assortment and it focuses on providing great value for each product. However, due to their low prices overall revenue of industry is decreased by four percent. Moreover, the growing competition between shopping malls and traditional kirana stores poses a challenge to organized retailers to consider an alternative method to generate excitement among the customers and to increase the shopper's patronage (Rajagopal, 2009). It has become essential to find some solutions for the organized retail in India. Further, we need to recognize the factors considered by consumers to visit organized food and grocery retail.

For the organisation studied in this research paper, in-store retailing is decreasing year by year and due to non-uniform pattern of sales, organization facing problems in inventory ordering and various type of stores management in various locations. The location of a retail store also plays a vital role in its success as it helps in determining retail strategy. The store image is directly dependent on the location of the store and therefore while establishing the store owner stop always analyze the outcomes.

Many online players have also stepped in grocery business, one is Amazon, who is in lime light because of its acquisitions with Whole Foods Market (WFM). Together they are trying to provide low prices for the product. In China additionally retailers like Alibaba plans to coordinate on the web and disconnected channels, it calls its biological system "New Retail".

McKinsey analysis suggests that, "By 2026, between \$200 billion and \$700 billion in revenues from traditional grocery retailers could have a shift to other formats and channels which can further hurt sales productivity of retail industry."

These factors generate are required to analyse store attributes of multi-chain grocery stores of an organization to not only predict sales but also for maximization of profits, provides store offers minimum prices for the products.

#### **CHAPTER 2: LITERATURE REVIEW**

Different attributes are studied through various research paper, few summaries is mentioned below that conducted research on factors influencing sales and assortment of products. Some of the studies are listed below are:

- (Martineau, (1958)), isolated store properties into two primary classes, i.e., functional and psychological. The functional classification establishes properties area, arrangement of items and store design. The psychological class establishes the emotions created by the utilitarian components of the store. The functional category is more prominent in research paper when compared with psychological.
- In the investigation of retail chains led by (Berry, John H. Kunkel and Leonard L.), chipped away at twelve variables cost of product, quality, variety, style of stocks, deals work force, deals advancement, publicizing, store environment, locational availability, administration, notoriety on changes and different elements. In a subsequent study, Berry (1969) identified three general factors that predominantly influenced consumer's store choice regardless 40 KAIM Journal of Management and Research Vol. 3 No. 2 November April 2011 of store type: namely, quality and variety of merchandise, sales staff, and store atmosphere.
- A prominent and widely-cited work on the topic of store image was that of (Lindquist)). Based on a review of 19 research articles, he synthesized the framework of these studies into a set of nine groups: merchandise, service, clientele, physical facilities, promotion, accessibility, store atmosphere, institutional and posttransaction satisfaction.
- (Doyle & Fenwick, (1975)), propose that price, product variety, one-stop shopping, quality, location of the store, advertisement, general appearance of the store and convenience are some of major attributes looked upon by the consumers while evaluating a grocery store.
- (Bearden, (1977)) distinguished seven attributes as potentially significant for store patronage: price, quality of merchandise, assortment, atmosphere, location, parking facilities and friendly staff.

- (Arnold et al. (1983)) extended the accessibility attribute to the ease of mobility through the store and fast checkout.
- (Mason, Mayer, and Ezell, (1994)), in their paper anticipated that costs plays a fundamental role in deciding consumer loyalty just as building client devotion in a retail location. In the retailing sector, the store having reasonable prices will often capture a large market share.
- (Hasty and Reardon, (1997)) classified store attributes into three general categories: accessibility (e.g., location, layout, appearance, and knowledgeable staff), facilitation of sales (e.g., low-priced specials, promotional offers and methods of payments accepted) and auxiliary attributes (e.g., play areas for children and food court).
- (Wong and Sohal, (2003)), attempted to decide the connection between administration quality and client eminence in retail chain of departmental stores in various locations. The results showed that service quality is positively associated with customer loyalty, and that the most significant predictor of customer loyalty in the city retail district is empathy, while the most significant predictor of customer loyalty in the country retail district is tangibles.
- (Solgaard and Hansen, (2003)) worked on factors important for customer evaluation of stores. These attributes include merchandise, assortment, merchandise quality, personnel, store layout, accessibility, cleanliness and atmosphere.
- (Spiller Bolten and Kennerknecht, (2006)) analyzed two variables, i.e., service and product quality used to predict customer satisfaction. They recommend that clients think about newness of foods grown from the ground as the nature of entire arrangement.
- In 2010 Ghosh, Tripathi and Kumar in their investigation attempted to deliver issues identified with store properties and its pertinence in the store determination by consumers. Eleven variables (store attributes) were used in the research paper.
- (Huddleston, Whipple, Mattick, and Lee, (2009)), performed study US family units, compared the client observations related with fulfillment of ordinary supermarkets with specialty stores. Item collection, quality, cost and administration were utilized to anticipate store fulfillment for each sort of store position. The outcomes indicated that

the impression of the fulfillment was higher among the specialty supermarket clients when compared with the regular market clients. For both store designs, the investigation found that the store value, item variety, administration and quality decidedly impacted fulfillment. Stepwise regression was performed and indicated that each store attribute contributed differently to store satisfaction for conventional and specialty store formats.

- (Hansen and Deutscher (1978)), presented study on "An empirical investigation of attribute importance in retail store selection". They inspected the significance of different parts of retail image on various purchaser fragments. They made examination of various traits across departmental and supermarkets to demonstrate harmoniousness and inferred that a same retail characteristics value, shading, quality and product were significant across various kinds of stores.
- In 2004 Nor Khalidah Abu introduced paper on "Administration Quality Dimensions: A Study on Various Sizes of Grocery Retailers". He recognized that the administration quality measurements basic to urban basic food item customers for little, medium and huge estimated supermarkets. It was an endeavor to recognize the basic quality element of Malaysian urban basic food item customers dependent on the Retail Service Quality Scale that considers the staple retail setting. The investigation was done as the littler markets in Malaysia were offering increasingly close to home administrations yet with insufficient stocks and offices; a complexity to the bigger retailers which are viewed as offering better product decision and open enhancements however with normalized and non-customized administrations.
- (Muhamad Jantan and Abdul Razak Kamaruddin (1999)) in the study on "Store image and store choice decision in Malasiya", performed the study of for major retail stores—Super, Gama, Suiwah and Yoahan in the Island of Penang. It was further analyzed based on Size, Variety of the store and the notoriety of these stores in the northern Malaysia. At last it was discovered that location and price were the noticeable elements for store decision of the client.

#### **CHAPTER 3: RESEARCH METHODOLOGY**

#### **4.1 Variables and Measurements**

In determining the variables affecting the multi-chain retail store multiple regression analysis and visualization analysis must be done to determine the nature of relationship between the variables.

The regression model specifications:

$$y=b_0+b_1x_1+b_2x_2+b_3x_3...b_nx_n+e_i$$
 for  $i=1,2,...n$ .

In this equation, y is the value of predicted variable or dependent variable of the n different independent variable. x is the value independent variables.

The b's -  $b_0$ ,  $b_1$ ,  $b_2$ , ...,  $b_i$ . The b's are constants and known as regression coefficients. Values are assigned to the b's based on the principle of least squares.

For visualization description tableau which converts raw and unstructured data into understandable format. Analysis is done on primary data of multi-chain retail store.

This is cross-sectional data and is assumed to be of 2019.

And regression equation with an interaction:

$$y = b_0 + b_1x_1 + b_2x_2 + b_3x_1x_2$$

In the above equation  $b_3$  is a regression coefficient and  $x_1x_2$  is the interaction, The interaction between  $x_1$  and  $x_2$  is called a two-way interaction. High-order interactions are also possible between independent variables, three-way interaction is shown in the following equation:

$$y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_1x_2 + b_5x_1x_3....b_nx_1X_2x_3...x_n.$$

Item Sales is our dependent variables and all other are independent variables, used to predict item sales

Table 3.1: Variables and their values

Variables	Label used	Label used Description				
	in research		Measurement			
Location	Outlet_Locatio	It is categorical variable and defines	Tier 1, Tier 2, Tier			
Type	n	the location of the stores.	3			
	_Type		Categorical			
Store Size	Outlet_Size	It is categorical variable and defines	Large, Medium,			
		the size of the stores.	Small			
			Categorical			
Item	Item_Visibility	It is a numeric value and calculated	x: [0,1] (Float)			
visibility		by calculating the distance from the	Float			
		reference point, i.e., distance of item	Numeric			
		in the shelf.				
T.	T. XXX 1 1		* .			
Item	Item_Weight	It is numeric value and is the	Integer			
weight		absolute value of the item.	Numeric			
Item type	Item_Type	It is a categorical value. Total	Categorical -16			
		number of items are 16.				
MRP	Item_MRP	It is integer value and absolute in	Integer			
		nature. It is maximum retail price of	Numeric			
		the item.				
Establishm	Outlet_	It is the year of establishment of all	Date [Year]			
ent year	Establishment	stores.				
	_Year					
Fat content	Item_Fat	It is a categorical value. Every	Low fat, Regular			
	_Content	item's fat content is measured in	fat			
		only two categories, i.e., low and	Categorical			
		regular.				

Type of store	Outlet_Type	It is a categorical value and identified as convenience, specialty, departmental and grocery.	Convenience, specialty, Departmental, Grocery Categorical
Outlet	Outlet	It is unique identifier of every outlet.	Categorical
identifier	_Identifier		
T	T. T1	T. ' '1 .'C' C '.	TT ' 1
Item	Item_Identifier	It is unique identifier of every item	Unique code
Identifier		used for its identification by the	
		store.	
Item sales	Item_Outlet	It is the absolute value. The sales of	Integer
	_Sales	a particular item.	Numeric
Derived	Quantity_sold,	Quantity_sold = Item Sales/MRP	Integer
variables*	year 1	Year 1 = 2021-Establishment year	Numeric

<sup>\*</sup>Desired variables are quantity sold which is derived from Sales/MRP. Assuming item is sold at MRP. Year1 is derived from establishment of the store, assuming data is of 2021 and therefore, subtracting establishment year from 2021.

## 4.2 Hypothesis

According to report on "Grocery Retailing in Asia Pacific" by KPMG (2009), the outlook of retail industry in Asia had never been more promising, retailers are struggling not only to gain but to preserve market share in the competitive world. The report reasoned that there are huge open doors for the retailers, and whether this development is accomplished naturally, or by obtaining, joint endeavor or vital union, careful business and market examination will be basic to help guarantee that the methodology fits the business targets and client needs.

Therefore, the study considered to check the impact of various variables on sales. Accordingly, the four hypotheses have been formulated, giving attention to the relationship with the literature support.

H<sub>1a</sub>: Item fat content impact item sales.

H<sub>1b</sub>: Establishment year of store impact sales.

H<sub>1c</sub>: Item visibility positively impact item sales.

H<sub>1d</sub>: Weight of items impact sales.

### **4.3 Characteristics of Sample Population**

Total sample in the main survey includes 8524 item identifiers, in the three type of cities in India. Outlet can be classified as Supermarket, Grocery store, departmental store, specialty store, convenience store. The supermarket1, supermarket2, supermarket3 is basically departmental store, specialty store and convenience store respectively. The Item Visibility ranges from 0 to 1 for different Item Identifiers. There are different types of food products available in the stores. These can be Dairy, Soft drinks, Baking goods, breads, frozen foods. Each outlet store is classified into small, medium, high depending on size of the store. There is total ten stores, three in tier 1, three in tier 2 and four in tier 3.

By March 2015, Company had managed to establish 4 retail outlets. The product offerings by Company had expanded from simply grocery items to include packaged food as well. The major customers of Company included newly married couples and unmarried young professionals who were part of the corporate workforce and lacked the time and energy to engage in grocery shopping. The retail outlets were also located strategically in localities where high proportions of their target market lived. The grocery items were priced very competitively which attracted many customers across all the retail outlets and very soon Company had acquired maximum market share among the competing grocery retail chains.

Towards the end of 2018, Company acquired an upcoming grocery chain which had multiple stores across Tamil Nadu, Karnataka, Kerala and Andhra Pradesh. This move helped Company expand into the Southern part of India and by 2018 Company had created its presence PAN India with its retail stores in 24 states within the country. The mission of the brand was to deliver a one-stop solution to all grocery and immediate daily needs of its customers. Moreover, they aimed to make the shopping experience more enjoyable and practical for the store visitors.

## **4.4 Data**

Data Source : Kaggle

Due to Covid situation, data couldn't be collected from industry specialist. Therefore, dataset from Kaggle has been used. Below is the glimpse of the data:

Total Records: 8524

Item_Iden	Item_Wei	Item_Fat	Item_Visib	Item_Type	Item_MRI	Outlet Io	le Outlet_Est	Outlet_Siz	Outlet_Lo	Outlet_Typ	Item_Outl	Quantity_sold
FDA15		Low Fat	0.016047		249.8092			Medium	Tier 1	Departme		14
DRC01	5.92	Regular	0.019278	Soft Drinks	48.2692	OUT018	2009	Medium	Tier 3	Speciality :		9
FDN15		Low Fat	0.01676	Meat	141.618	OUT049	1999	Medium	Tier 1	Departme		14
FDX07	19.2	Regular	0	Fruits and	182.095	OUT010	1998	Medium	Tier 3	Grocery St	732.38	4
NCD19		Low Fat	0	Household		OUT013	1987	Large	Tier 3	Departme		18
FDP36	10.395	Regular	0	Baking Go		OUT018	2009	Medium	Tier 3	Speciality :	556.6088	10
FDO10		Regular		Snack Food		OUT013		Large	Tier 3	Departme		5
FDP10	12.86	Low Fat	0.12747	Snack Food	107.7622	OUT027	1985	Medium	Tier 3	Convenien	4022.764	37
FDH17	16.2	Regular	0.016687	Frozen Foo	96.9726	OUT045	2002	Small	Tier 2	Departme	1076.599	11
FDU28	19.2	Regular	0.09445	Frozen Foo	187.8214	OUT017	2007	Large	Tier 2	Departme	4710.535	25
FDY07	11.8	Low Fat	0	Fruits and	45.5402	OUT049	1999	Medium	Tier 1	Departme	1516.027	33
FDA03	18.5	Regular	0.045464	Dairy	144.1102	OUT046	1997	Small	Tier 1	Departme	2187.153	15
FDX32		Regular	0.100014	Fruits and	145.4786	OUT049	1999	Medium	Tier 1	Departme		10
FDS46	17.6	Regular	0.047257	Snack Food	119.6782	OUT046	1997	Small	Tier 1	Departme	2145.208	17
FDF32	16.35	Low Fat	0.068024	Fruits and	196.4426	OUT013	1987	Large	Tier 3	Departme	1977.426	10
FDP49	9	Regular	0.069089			OUT046		Small	Tier 1	Departme	1547.319	27
NCB42	11.8	Low Fat	0.008596	Health and	115.3492	OUT018	2009	Medium	Tier 3	Speciality !	1621.889	14
FDP49	9	Regular	0.069196	Breakfast	54.3614	OUT049	1999	Medium	Tier 1	Departme	718.3982	13
DRI11	12.86	Low Fat	0.034238	Hard Drink	113.2834	OUT027	1985	Medium	Tier 3	Convenien	2303.668	20
FDU02	13.35	Low Fat	0.102492	Dairy	230.5352	OUT035	2004	Small	Tier 2	Departme	2748.422	11
FDN22	18.85	Regular	0.13819	Snack Food	250.8724	OUT013	1987	Large	Tier 3	Departme	3775.086	15
FDW12	12.86	Regular	0.0354	Baking Go	144.5444	OUT027	1985	Medium	Tier 3	Convenien	4064.043	28
NCB30	14.6	Low Fat	0.025698	Household	196.5084	OUT035	2004	Small	Tier 2	Departme	1587.267	8
FDC37	12.86	Low Fat	0.057557	Baking Go	107.6938	OUT019	1985	Small	Tier 1	Grocery St	214.3876	1
DR28	13.85	Regular	0.025896	Frozen Foo	165.021	OUT046	1997	Small	Tier 1	Departme	4078.025	24
NCD06	13	Low Fat	0.099887	Household	45.906	OUT017	2007	Medium	Tier 2	Departme	838.908	18
DV10	7.645	Regular	0.066693	Snack Food	42.3112	OUT035	2004	Small	Tier 2	Departme	1065.28	25
DRJ59	11.65	Low Fat	0.019356	Hard Drink	39.1164	OUT013	1987	Large	Tier 3	Departme	308.9312	7
FDE51	5.925	Regular	0.161467	Dairy	45.5086	OUT010	1998	Medium	Tier 3	Grocery St	178.4344	3
FDC14	12.86	Regular	0.072222	Canned	43.6454	OUT019	1985	Small	Tier 1	Grocery St	125.8362	2
FDV38	19.25	Low Fat	0.170349	Dairy	55.7956	OUT010	1998	Medium	Tier 3	Grocery St	163.7868	2
NCS17	18.6	Low Fat	0.080829	Health and	96.4436	OUT018	2009	Medium	Tier 3	Speciality !	2741.764	28
FDP33	18.7	Low Fat	0	Snack Food	256.6672	OUT018	2009	Medium	Tier 3	Speciality !	3068.006	11
FDO23	17.85	Low Fat	0	Breads	93.1436	OUT045	2002	Medium	Tier 2	Departme	2174.503	23
DRH01	17.5	Low Fat	0.097904	Soft Drinks	174.8738	OUT046	1997	Small	Tier 1	Departme	2085.286	11
NCX29	10	Low Fat	0.089291	Health and	146.7102	OUT049	1999	Medium	Tier 1	Departme	3791.065	25
FDV20	12.86	Regular	0.059512	Fruits and	128.0678	OUT027	1985	Medium	Tier 3	Convenien	2797.692	21
DRZ11	8.85	Regular	0.113124	Soft Drinks	122.5388	OUT018	2009	Medium	Tier 3	Speciality :	1609.904	13
FDX10	12.86	Regular	0.123111	Snack Food	36.9874	OUT027	1985	Medium	Tier 3	Convenien	388.1614	10
FDB34	12.86	Low Fat	0.026481	Snack Food	87.6198	OUT027	1985	Medium	Tier 3	Convenien	2180.495	24
FDU02	13.35	Low Fat	0.102512	Dairy	230.6352	OUT046	1997	Small	Tier 1	Departme	3435.528	14
FDK43	9.8	Low Fat	0.026818	Meat	126.002	OUT013	1987	Large	Tier 3	Departme	2150.534	17
FDA46	13.6	Low Fat	0.117818	Snack Food	192.9136	OUT049	1999	Medium	Tier 1	Departme	2527.377	13

Figure 3.1: Dataset

#### **CHAPTER 4: ANALYSIS**

There are various attributes on which the sales were dependent. Outlet can be classified as Supermarket, Grocery store, departmental store, specialty store, convenience store. These things also influence the sales of the company in the long run. In the data collected by market research team that is available for analysis, the supermarket1, supermarket2, supermarket3 is basically departmental store, specialty store and convenience store. The Item Visibility ranges from 0 to 1 for different Item Ids.

Different Item Types need to be placed differently on the shelves. There are different types of food products available in our store. These can be Dairy, Soft drinks, Baking goods, breads, frozen foods. Each outlet store is classified into small, medium, high depending on size of the store. Sales is the most important factor that the upper management will look to predict. As in retail chains the margin is very low for the retailer.

Before starting the analysis, the data needs to be cleaned – following issues were detected with the data:

- Name Inconsistency- The spelling of low fat (Fat content) was different in various rows
  which could create issue with the analysis as system will consider them as different
  categorizations.
- There were few outliers in case of data visibility, which was removed as they could affect the analysis.
- Duplication/ Redundancy There were few redundant values which was removed before analysis.

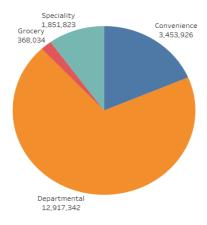
It was made sure that the data was met with all the 5 following quality checks.

- 1. **Validity.** The degree to which your data conforms to defined business rules or constraints.
- 2. **Accuracy.** Ensure your data is close to the true values.
- 3. **Completeness.** The degree to which all required data is known.
- 4. **Consistency.** Ensure your data is consistent within the same dataset and/or across multiple data sets.
- 5. **Uniformity.** The degree to which the data is specified using the same unit of measure.

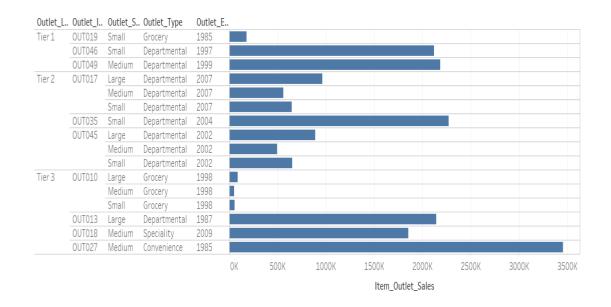
# **4.1 Descriptive Analysis**

Descriptive analysis is done on tableau Version: 2019.1.

Graph 4.1 Pie chart depicting sales of each type of type store in summation.



Graph 4.2: Item sales v/s Outlet location/Establishment year/ Outlet type/ Outlet size/ Outlet Identifier



Outlet\_Location\_Type / Outlet\_Type / Outlet\_Size Tier 1 Tier 3 3.561.727 3.453.926 3500k 3000K Item\_Outlet\_Sales 2 183 970 2.142.664 2,118,395 2000K 1.854.593 1 851 823 1500K 1.055.993 500K 179 694 85.599 Medium Small Small Large Medium Medium Large Large Medium

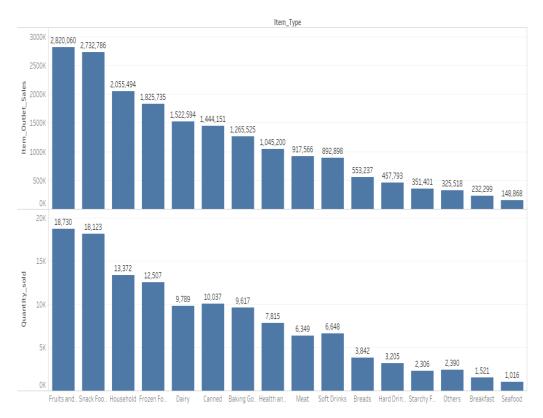
Graph 4.3: Item sales v/s Outlet location/ Outlet type/ Outlet size

Sum of Item\_Outlet\_Sales for each Outlet\_Size broken down by Outlet\_Location\_Type and Outlet\_Type. Color shows details about Outlet\_Type.

#### **INFERENCES**

- From the above plot we can analyze that company should open more medium size store
  than large size, as the expense is more in large sized and revenue generation are less as
  compared to medium stores.
- The small stores are also generating revenue more than small size outlets. The expense of small sized stores is less and therefore profit margin increases.
- The expansion should be of medium and small sized stores. The large sized expansion will
  not generate satisfactory revenue.
- From the above plot we can analyze that that is popular among tier 3 cities and least popular in tier 1 cities. There is need to create brand value in tier 1 cities as most of the population is shifting to these cities.
- According to the plot grocery stores of the company are not very popular, they could be merged with other type of stores or could be closed as they are not generating much of a revenue.
- Departmental stores in both tier 1 and tier 2 are doing well and could be expanded more to increase sales.

- In tier 3 departmental and specialty stores need a boast, and need to campaign well. In total tier 3 cities are generating maximum revenue through various stores.
- As analyzed earlier grocery stores are only 2 in total owned by the company are not at all doing well, so my recommendation would to change the grocery store to departmental store. Or else aggressive marketing has to be adopted for grocery stores.
- In tier 2 cities expansion can be done as all the 3 departmental stores are performing are good and expansion can increase brand value, which could increase revenue generation. In tier 3 cities convenience stores could be expanded and other stores need more publicizing activities.
- The accommodation of more items in departmental stores can be done, like merging with grocery store. According to size of the store the more items can be accommodated.
- The OUT045 also doesn't have satisfactory revenue generation in large size. The OUT019 also generates less revenue and needs modifications.
- The OUT010 generating very low revenue in comparison and therefore is advised to close or merge or convert it into other type of store. In small size it could be advertised or could try increase revenue.



 $Sum\ of\ Item\_Outlet\_Sales\ and\ sum\ of\ Quantity\_sold\ for\ each\ Item\_Type$ 

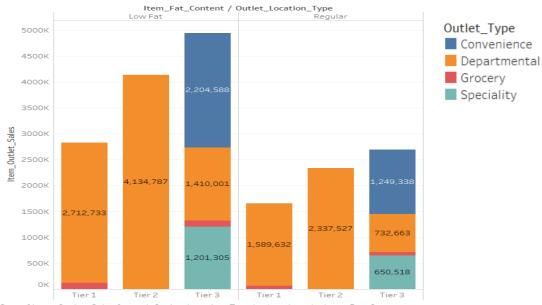
Graph 4.4: Quantity sold v/s Outlet location/ Outlet type/ Outlet size/ Item type/ Outlet Identifier

Outlet_Location_Type / Outlet_Size / Outlet_Type / Outlet_Identifier																												
		Tier 1			Tier 2								Tier 3															
	Medium	Sm	nall	La	rge	Med	dium	Small			Large		Medium			Small												
	Depart	Depart	Grocery	Depart	mental	Depart	Departmental		Departmental		Departmental		Departmental		Depart	Grocery	Conven	Grocery	Special	Grocery								
Item Type	OUT049	OUT046	OUT019	OUT017	OUT045	OUT017	OUT045	OUT017	OUT035	OUT045	OUT013	OUT010	OUT027	OUT010	OUT018	OUT010												
Snack Foods	2,225	1,918	154	1,017	919	598	448	463	2,348	555	2,063	60	3,474	43	1,806	32												
Fruits and Vegetabl	2,259	1,893	135	1,007	823	617	662	491		666		59	3,918	41	1,775	33												
Household	1,706	1,440	89	531	590	453	364	450	1,748	506	1,589	47	2,504	48	1,268	39												
Canned	971	1,215	91	532	576	338	270	345	1,360	300	1,005	22	1,964	27	1,005	16												
Dairy	1,156	1,169	87	502	428	312	215	394	1,136	376	1,178	35	1,758	18	1,000	25												
Frozen Foods	1,453	1,729	85	750	529	313	228	655	1,414	406	1,405	52	2,257	13	1,179	39												
Baking Goods	1,070	1,359	95	454	503	358	279	376	960	343	1,134	39	1,698	14	917	18												
Meat	801	655	67	307	292	148	137	241	704	107	645	47	1,527	16	635	20												
Health and Hygiene	854	958	66	373	368	310	270	275	849	166	847	43	1,590	21	804	21												
Soft Drinks	754	649	49	344	295	191	308	359	773	263	856	24	1,160	15	591	17												
Breads	407	453	31	175	256	65	67	79	529	182	392	23	783	6	387	7												
Others	305	293	25	110	108	33	92	100	276	122	249	5	388	6	270	8												
Breakfast	203	144	26	36	56	33	13	92	195	59	165	10	331	0	148	10												
Hard Drinks	480	325	12	154	296	164	50	62	369	70	353	3	567	7	283	10												
Seafood	74	146	10	30	64	20	58	9	169	70	70	1	162	4	129													
Starchy Foods	276	249	4	107	94	44	99	148	383	70	267	12	349	2	202	0												

Sum of Quantity\_sold broken down by Outlet\_Location\_Type, Outlet\_Size, Outlet\_Type and Outlet\_Identifier vs. Item\_Type. Color shows sum of Quantity\_sold. The marks are labeled by sum of Quantity\_sold.

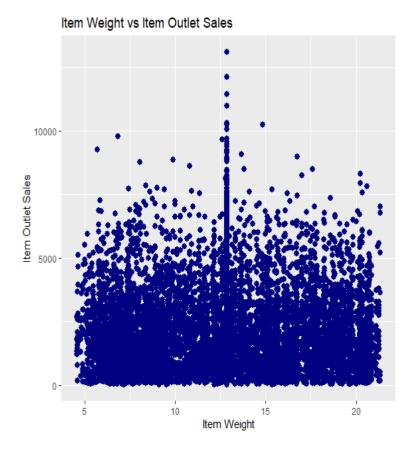
Graph 4.5

## a.) Sales v/s Outlet location/ Outlet type/ Fat content



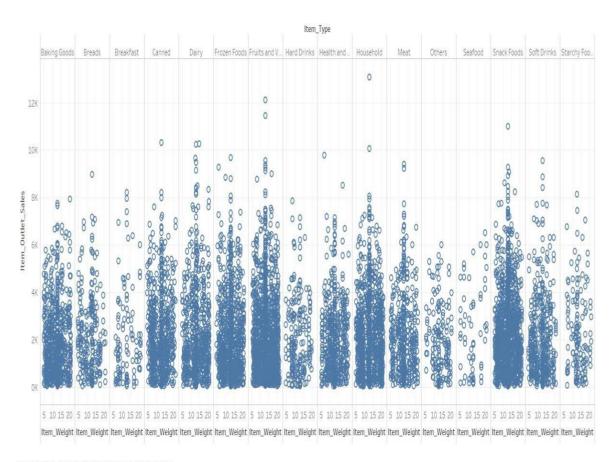
Sum of Item\_Outlet\_Sales for each Outlet\_Location\_Type broken down by Item\_Fat\_Content. Color shows details about Outlet\_Type.

## b.) Sales v/s Item weight



- From the plot above, we can analyze that as weight of a product increases, sales increases and after a point it again starts decreasing.
- This indicates customer purchases maximum around 12, therefore quantity items of weight 12 should be kept in maximum number and below and above 12 should be kept in proportionate order.

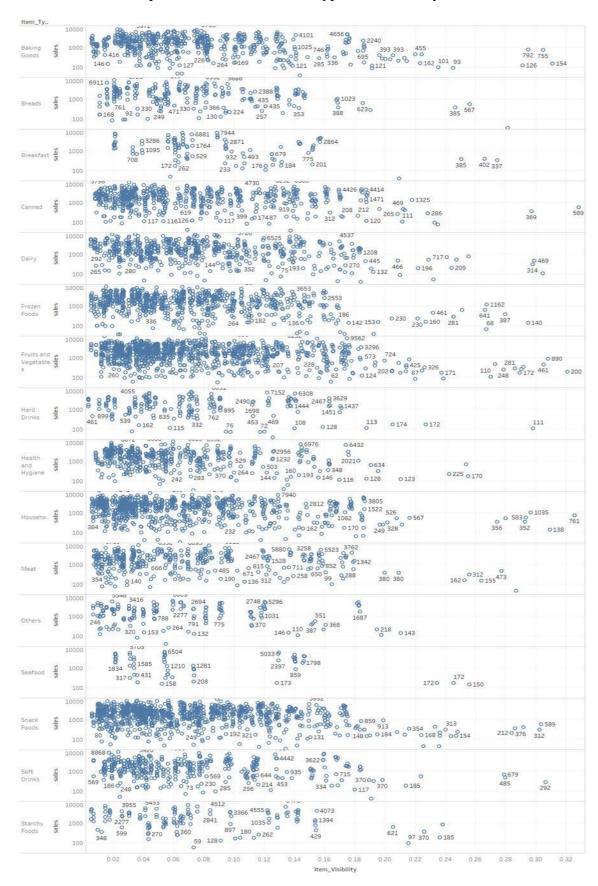
#### c.) Sales v/s Item weight vs Item type



 $Item\_Weight \, vs. \, Item\_Outlet\_Sales \, broken \, down \, by \, Item\_Type.$ 

- Pattern in individual item is observed like, breads after 12.86 as weight increases the sales decreases.
- The example of this concept can be seen, like tea, where daily consumers usually buy 1kg or 0.5kg pack and above this weight the consumers started decreasing. Below this weight also customers don't buy as this small packs won't last for a month and grocery shopping are done for whole month.
- The same can be implemented above to various products.
- However, in some item the scenario is different, like in seafoods the pattern is not observed.

Graph 4.6 Item sales v/s Item type/Item visibility



- According to data, fruits and vegetable, snack foods are of maximum sale and therefore should kept in maximum quantity and on the other hand breakfast, seafoods are sold in very less quantity and therefore should be kept in small amounts.
- OUT010 in small size should not keep seafood and starchy foods at all. In medium size
  breads, breakfast, seafood and starchy foods should be ordered in limited stalks or could
  also be avoided. In large size it should keep limited stock of others, seafoods and hard
  drinks.
- Tier 1 shops could produce more snack foods, fruits and vegetables, households and could keep starchy foods, seafoods and hard drinks in less amount.
- Seafood should be kept only on limited shops, i.e., OUT049, OUT046 OUT035, OUT045, OUT018, OUT027. Other shops could avoid keeping it or could keep it in very small amount.
- In tier 2 medium stores, breakfast should be kept in small amount as the sale is not much as compared to size Low fat products sell more than regular products. Therefore, low fat products stock should be more than regular products.
- From the plot above, we can analyze that as weight of a product increases, sales increases and after a point it again starts decreasing. This indicates customer purchases maximum around 12.86, therefore quantity items of weight 12.86 should be kept in maximum number and below and above 12.86 should be kept in proportionate order. However, in some item the scenario is different, like in seafoods the pattern is not observed.
- OUT010: Starchy foods are sold more when visibility is more. The sales of seafoods could increase with visibility. Other products are not affected with visibility. It should not be very low and not very high it should range more than 0.02 and less than 0.24
- <u>OUT013</u>: The visibility of products should not exceed 0.18 and not less than 0.02, it would not affect the sales more. Others, canned and baking goods do goods sales with high visibility
- <u>OUT017</u>: Breakfast with 0.16 visibility shows better sales, so with starchy foods and baking goods. Visibility of any product should not be less than 0.02.
- <u>OUT018</u>: hard drinks could be kept in front shelves as their sales increased a bit when visibility was increased to 0.18.
- <u>OUT019</u>: The visibility is independent sales. Household products are only item whose increased a bit with high visibility. This can also not be sure that by increasing visibility it will increase.

- <u>OUT027</u>: The recommendation for front shelves could snacks foods, others. Otherwise sales are affected by visibility.
- <u>OUT035</u>: Seafoods sales might increase with more visibility. The trend in plot indicates it could improve the sales. Otherwise, visibility is not a major factor according to the date given.
- <u>OUT035</u>: The high visibility could be tried to household, breakfast and seafoods which can generate high sales. The visibility should be at least higher than 0.02.
- <u>OUT045</u>: Seafood and breakfast should have higher visibility as their sales are low and high visibility could improve sales.
- <u>OUT046</u>: It is advised to does not low the visibility below 0.02.
- <u>OUT049</u>: Visibility of others and seafoods could as much as 0.16 be high in comparison to other.

In range of 0.02 to 0.18 the visibility does not have any linear relationship. However, above and below that range could decrease the sales. Those items which have good sales can be put at eye-level or waist-level so as to increase their sales to a significant level. Items such as Baking Goods, Breads, Dairy, Canned Foods, Soft Drinks and Health and Hygiene items can be allotted more shelf space so as to increase their sales even more.

#### **4.2 Predictive Analysis**

Regression method is used for predictive modelling. Various categorization has been tried to know predict best model and find out the various independent variables effecting the dependent variable, i.e., item sales. The data has been summarized below:

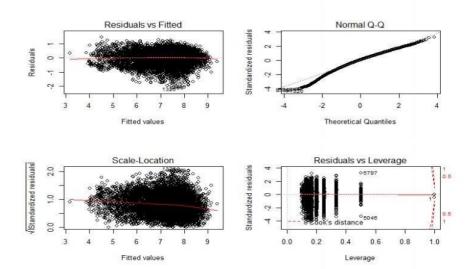
- The data was previously suffering from heteroskedasticity (funnel shaped residual-fitted graph), i.e., error terms did not possess constant variance.
- So, we transformed the Dependent Variable to its log value to make our model ready for regression.
- After applying regression using log, the diagnostic graphs came out to be alright. That
  means, our model is fulfilling the assumptions of regression (shown below in the
  diagnostic graphs).

- Multiple R Squared Value- This metric explains the percentage of variance explained by covariates in the model. It ranges between 0 and 1. Usually, higher values are desirable but it rests on the data quality and domain. For example, if the data is noisy, you'd be happy to accept a model at low R<sup>2</sup> values. Ours is coming out to be 0.79 (for the whole data model), which is significant.
- Adjusted R<sup>2</sup>— The problem with R<sup>2</sup> is that it keeps on increasing as you increase the number of variables, regardless of the fact that the new variable is actually adding new information to the model. To overcome that, we use adjusted R<sup>2</sup> which doesn't increase (stays same or decrease) unless the newly added variable is truly useful. Our adjusted R<sup>2</sup> is 0.7466.
- F Statistics It evaluates the overall significance of the model. It is the ratio of explained variance by the model by unexplained variance. It compares the full model with an intercept only (no predictors) model. Its value can range between zero and any arbitrary large number. Naturally, higher the F statistics, better the model. Ours is 16.98 which is a good number.
- Root Mean Squared Error (RMSE)—Error metric is the crucial evaluation number we must check. Since all these are errors, lower the number, better the model. Ours is 0.512.
- It can be seen that p-value of the F-statistic is highly significant i.e. <2.2e-16.

#### **Plots and Summaries**

- The first plot is residuals v/s fitted value. It indicates linearity in the data. It should look random, i.e., without any pattern.
- The second plot is normal Q-Q which indicated normal probability graph. It is sued to determine the normal distribution of errors, if it shows straight line then errors are normally distributed. Therefore, in the study the errors are distributed normally.
- The third plot is Scale-Location and used to determine heteroskedasticity. Like the first plot, ideally it should look random, i.e., no patterns.
- The last plot (Cook's distance) tells us which points have the greatest influence on the regression (leverage points).

## Whole Eat Easy Data



```
lm(formula = log(Item_Outlet_Sales) ~ Item_Type + Item_Weight +
    Item_Fat_Content + Item_Visibility + Item_MRP + Outlet_Identifier,
    data = mydata)
Residuals:
                10
                      Median
                                    30
     Min
-2.30676 -0.29451
                     0.06842 0.37871 1.35862
coefficients:
                                    Estimate Std. Error t value Pr(>|t|)
(Intercept)
                                   4.384e+00
                                               3.960e-02 110.701
                                                                      <2e-16 ***
Item_TypeBreads
                                   2.813e-02
                                               4.003e-02
                                                            0.703
                                                                       0.482
Item_TypeBreakfast
                                  -6.906e-02
                                               5.554e-02
                                                            -1.243
                                                                       0.214
                                               2.990e-02
                                                            0.848
                                   2.535e-02
                                                                       0.397
Item_TypeCanned
                                               2.964e-02
                                  -6.894e-02
                                                                       0.020
Item_TypeDairy
                                                            -2.326
Item_TypeFrozen Foods
                                  -5.427e-02
                                               2.804e-02
                                                            -1.935
                                                                       0.053
                                  -4.607e-03
Item_TypeFruits and Vegetables
                                               2.618e-02
                                                            -0.176
                                                                       0.860
                                                                       0.608
Item_TypeHard Drinks
                                  -2.206e-02
                                               4.296e-02
                                                            -0.514
Item_TypeHealth and Hygiene
                                   1.100e-02
                                                3.240e-02
                                                            0.340
                                                                       0.734
Item_TypeHousehold
                                   -2.643e-02
                                               2.854e-02
                                                            -0.926
                                                                       0.354
Item_TypeMeat
                                   2.226e-02
                                               3.365e-02
                                                             0.661
                                                                       0.508
Item_TypeOthers
                                   2.181e-03
                                               4.697e-02
                                                             0.046
                                                                       0.963
                                               7.050e-02
Item_TypeSeafood
                                   5.687e-03
                                                             0.081
                                                                       0.936
Item_TypeSnack Foods
                                  -1.439e-03
                                               2.632e-02
                                                            -0.055
                                                                       0.956
Item_TypeSoft Drinks
                                               3.342e-02
                                                            -0.673
                                                                       0.501
                                  -2.251e-02
Item_TypeStarchy Foods
                                  -4.748e-02
                                               4.908e-02
                                                            -0.967
                                                                       0.333
                                  -4.212e-04
Item_Weight
                                               1.388e-03
                                                            -0.303
                                                                       0.762
                                               1.345e-02
                                                                       0.310
Item_Fat_ContentRegular
                                   1.366e-02
                                                            1.016
Item_Visibility
                                   -5.314e-02
                                               1.185e-01
                                                            0.449
                                                                       0.654
                                                                      <2e-16 ***
Item_MRP
                                   8.316e-03
                                               9.416e-05
                                                            88.315
Outlet_IdentifierOUT013
                                   1.933e+00
                                               2.926e-02
                                                            66.065
                                                                      <2e-16 ***
                                                                      <2e-16 ***
Outlet_IdentifierOUT017
                                   1.992e+00
                                               2.927e-02
                                                            68.054
                                                                      <2e-16 ***
Outlet_IdentifierOUT018
                                   1.785e+00
                                               2.926e-02
                                                            61.009
Outlet IdentifierOUT019
                                                            0.914
                                   2.989e-02
                                               3.272e-02
                                                                       0.361
Outlet_IdentifierOUT027
                                               2.927e-02
                                   2.494e+00
                                                            85.225
                                                                      <2e-16
                                                                      <2e-16 ***
Outlet_IdentifierOUT035
                                   2.015e+00
                                               2.925e-02
                                                            68.863
Outlet_IdentifierOUT045
                                                                      <2e-16 ***
                                   1.917e+00
                                               2.928e-02
                                                            65.484
                                                                      <2e-16 ***
Outlet_IdentifierOUT046
                                                            66.702
                                   1.952e+00
                                               2.926e-02
Outlet_IdentifierOUT049
                                   1.997e+00
                                               2.926e-02
                                                            68.243
                                                                      <2e-16 ***
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' '1
Residual standard error: 0.5378 on 8494 degrees of freedom Multiple R-squared: 0.7214, Adjusted R-squared: 0.7205 F-statistic: 785.4 on 28 and 8494 DF, p-value: < 2.2e-16
                                  Adjusted R-squared: 0.7205
```

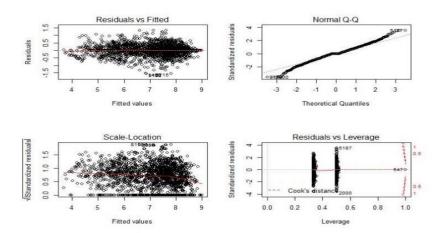
The analysis of whole data can be useful to understand overall situation of the store but in order to understand the problems in detail, according to the location we need categorization of the according to different variables. Following is the categorization of the same.

## 4.2.2 Prediction for different Categorization

- Advantage:
  - a.) More accurate model with higher R2 value.
  - b.) We can take predict sales based on different locations and later compare the actual sales with the predicted sales to make effective decisions.
- Different Categorizations are as follows:
  - a) **Outlet Locations:** Prediction is done based on different outlet-location types, i.e., Tier 1, Tier 2, Tier 3.
  - b) **Outlet Type:** Prediction is done based on different outlet types, i.e., Speciality, Grocery, Convenience and Departmental.
  - c) **Outlet Size:** Prediction is done based on different outlet size, i.e., Medium, Small, Large.
  - d) **Fat Content:** Prediction is done based on different fat content, i.e., Regular and low fat.

### **Location-Wise**

#### Tier 1



Call:
lm(formula = log(Item\_Outlet\_Sales) ~ Item\_Weight + Item\_Fat\_Content +
 Item\_Visibility + Item\_Type + Item\_MRP + Outlet\_Identifier,
 data = tier1)

#### Residuals:

Min 1Q Median 3Q Max -2.27204 -0.30731 0.06421 0.39195 1.33979

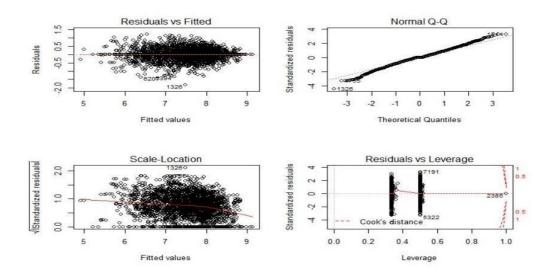
#### Coefficients:

	Estimate	Std. Error	t value	Pr(> t )	
(Intercept)	4.565221	0.065621	69.569	<2e-16	***
Item_Weight	-0.003246	0.002746	-1.182	0.2372	
Item_Fat_ContentRegular	0.002139	0.025859	0.083	0.9341	
Item_Visibility	-0.141002	0.209185	-0.674	0.5003	
Item_TypeBreads	-0.012071	0.078154	-0.154	0.8773	
Item_TypeBreakfast	-0.075787	0.103628	-0.731	0.4646	
Item_TypeCanned	-0.012179	0.057581	-0.212	0.8325	
Item_TypeDairy	-0.138272			0.0133	ŵ
Item_TypeFrozen Foods	-0.098390	0.053112	-1.853	0.0641	
<pre>Item_TypeFruits and Vegetables</pre>		0.050304	-1.547	0.1221	
Item_TypeHard Drinks	-0.076015	0.083399	-0.911	0.3621	
Item_TypeHealth and Hygiene	-0.052844	0.062961	-0.839	0.4014	
Item_TypeHousehold	-0.095021	0.054830	-1.733	0.0832	
Item_TypeMeat	-0.030067	0.063784		0.6374	
Item_TypeOthers	-0.136981	0.084546		0.1053	
Item_TypeSeafood	-0.099830			0.4497	
Item_TypeSnack Foods	-0.067069			0.1831	
Item_TypeSoft Drinks	-0.147284	0.064728	-2.275	0.0230	京
Item_TypeStarchy Foods	-0.063002	0.099894	-0.631	0.5283	
Item_MRP	0.008024	0.000182	44.076	TEC TO	***
Outlet_IdentifierOUTO46	1.917551	0.031503	60.868	<2e-16	資資資
Outlet_IdentifierOUT049	1.962276	0.031510	62.275	<2e-16	***

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.547 on 2366 degrees of freedom Multiple R-squared: 0.7539, Adjusted R-squared: 0.7518 F-statistic: 345.2 on 21 and 2366 DF, p-value: < 2.2e-16

# Tier 2



Call:
lm(formula = log(Item\_Outlet\_Sales) ~ Item\_Weight + Item\_Fat\_Content +
 Item\_Visibility + Item\_Type + Item\_MRP + Outlet\_Identifier,
 data = tier2)

#### Residuals:

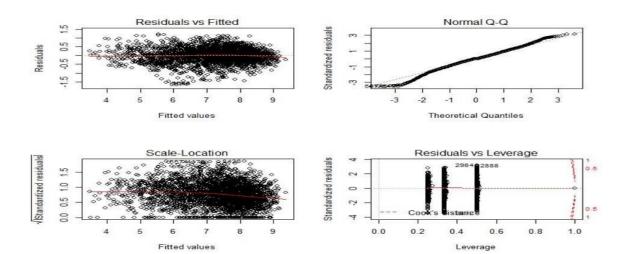
Min 1Q Median 3Q Max -2.14094 -0.27449 0.07119 0.36553 1.21239

### Coefficients:

	Estimate	Std. Error	t value	Pr(> t )	
(Intercept)	6.3440751	0.0545631	116.271	< 2e-16	***
Item_Weight	-0.0001771	0.0021795	-0.081	0.93523	
Item_Fat_ContentRegular	0.0531619	0.0230303	2.308	0.02105	黎
Item_Visibility	-0.3622781	0.2253388	-1.608	0.10801	
Item_TypeBreads	0.0424309	0.0680191	0.624	0.53280	
Item_TypeBreakfast	0.0007404	0.1000560	0.007	0.99410	
Item_TypeCanned	0.1005093	0.0506932	1.983	0.04750	蒙
Item_TypeDairy	-0.0230308	0.0512817	-0.449		
Item_TypeFrozen Foods	-0.0201121		-0.418	0.67583	
Item_TypeFruits and Vegetables	0.0294308	0.0449179	0.655	0.51238	
Item_TypeHard Drinks	0.0841538	0.0727945	1.156	0.24776	
Item_TypeHealth and Hygiene	0.0614940	0.0558515	1.101	0.27098	
Item_TypeHousehold	0.0344715	0.0489992	0.704	0.48180	
Item_TypeMeat	0.0110861	0.0596619	0.186	0.85260	
Item_TypeOthers	0.0871699	0.0823771	1.058	0.29006	
Item_TypeSeafood	0.1630354	0.1180294	1.381	0.16729	
Item_TypeSnack Foods	0.0278682	0.0449059	0.621	0.53492	
Item_TypeSoft Drinks	0.0283058	0.0560300	0.505	0.61347	
Item_TypeStarchy Foods	0.0341199	0.0809833	0.421	0.67355	
Item_MRP	0.0082604	0.0001616	51.106	< 2e-16	***
Outlet_IdentifierOUT035	0.0224595	0.0244659	0.918	0.35870	
Outlet_IdentifierOUT045	-0.0756473	0.0244917	-3.089	0.00203	**
Signif. codes: 0 '***' 0.001	'**' 0.01 '1	0.05 '.'	0.1 ' '	1	

Residual standard error: 0.5263 on 2763 degrees of freedom Multiple R-squared: 0.4932, Adjusted R-squared: 0.4893 F-statistic: 128 on 21 and 2763 DF, p-value: < 2.2e-16

#### Tier 3



Call:
lm(formula = log(Item\_Outlet\_Sales) ~ Item\_Weight + Item\_Fat\_Content +
 Item\_Visibility + Item\_Type + Item\_MRP + Outlet\_Identifier,
 data = tier3)

#### Residuals:

Min 1Q Median 3Q Max -2.28282 -0.29772 0.07148 0.37142 1.38515

# Coefficients:

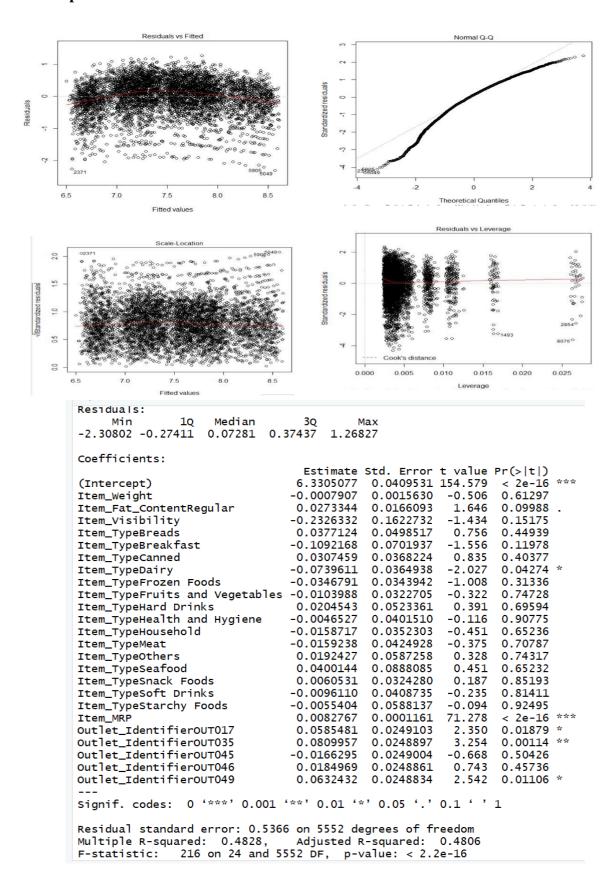
	Estimate	Std. Error	t value	Pr(> t )	
(Intercept)	4.2888623	0.0580950	73.825	<2e-16	***
Item_Weight	0.0015257	0.0023766	0.642	0.521	
Item_Fat_ContentRegular	-0.0090976	0.0215861	-0.421	0.673	
Item_visibility	0.2478669	0.1881800	1.317	0.188	
Item_TypeBreads	0.0496792	0.0639534	0.777	0.437	
Item_TypeBreakfast	-0.1147991	0.0876047	-1.310	0.190	
Item_TypeCanned	-0.0069521	0.0483009	-0.144	0.886	
Item_TypeDairy	-0.0554168	0.0478755	-1.158	0.247	
Item_TypeFrozen Foods	-0.0510903	0.0453864	-1.126	0.260	
Item_TypeFruits and Vegetables	0.0237632	0.0419434	0.567	0.571	
Item_TypeHard Drinks	-0.0729030	0.0690252	-1.056	0.291	
Item_TypeHealth and Hygiene	0.0200561	0.0513230	0.391	0.696	
Item_TypeHousehold	-0.0240832	0.0457246	-0.527	0.598	
Item_TypeMeat	0.0609605	0.0531249	1.147	0.251	
Item_TypeOthers	0.0518785	0.0779549	0.665	0.506	
Item_TypeSeafood	-0.0527906	0.1178252	-0.448	0.654	
Item_TypeSnack Foods	0.0243556	0.0424673	0.574	0.566	
Item_TypeSoft Drinks	0.0269030	0.0543451	0.495	0.621	
Item_TypeStarchy Foods	-0.1023013	0.0783386	-1.306	0.192	
Item_MRP	0.0085812	0.0001505	57.005	<2e-16	***
Outlet_IdentifierOUT013	1.9453434	0.0300469	64.743	<2e-16	
Outlet_IdentifierOUT018	1.7978468	0.0300249	59.879	<2e-16	救救救
Outlet_IdentifierOUT027	2.5072247	0.0300906	83.322	<2e-16	音音音

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

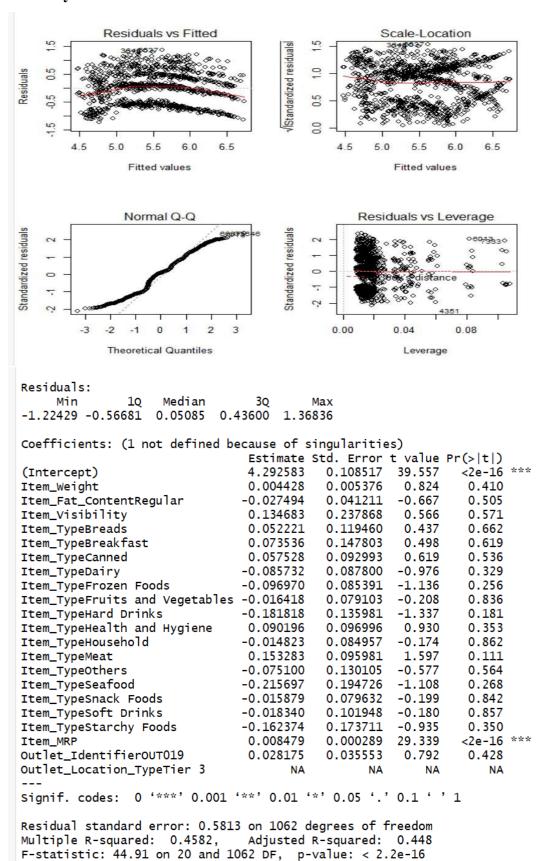
Residual standard error: 0.5407 on 3327 degrees of freedom Multiple R-squared: 0.7675, Adjusted R-squared: 0.7659 F-statistic: 499.1 on 22 and 3327 DF, p-value: < 2.2e-16

# **Outlet Store Type**

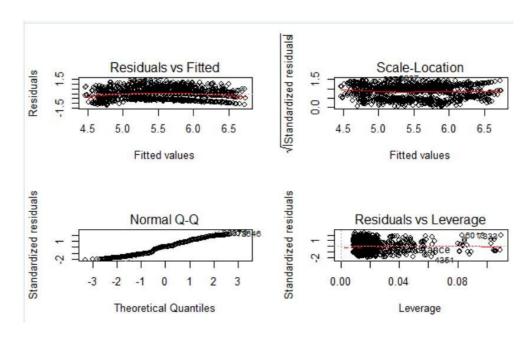
### • Departmental Store



### Grocery Store

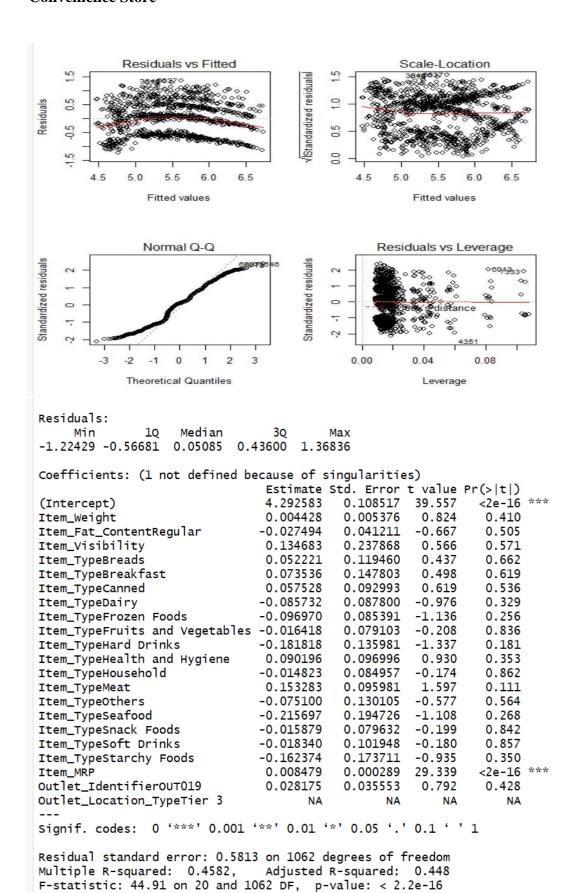


### Speciality Store



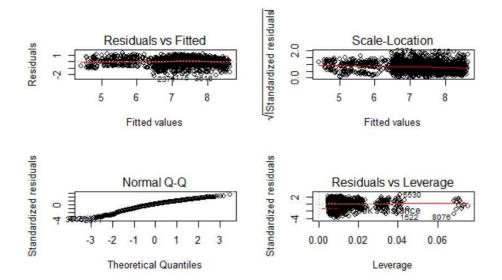
Call: lm(formula = log(Item\_Outlet\_Sales) ~ Item\_Weight + Item\_Fat\_Content + Item\_Visibility + Item\_Type + Item\_MRP + Outlet\_Identifier + Outlet\_Size, data = Speciality) Residuals: Median 3Q Min **1**Q -1.22440 -0.56672 0.04964 0.43752 1.37697 Coefficients: Estimate Std. Error t value Pr(>|t|)<2e-16 \*\*\* (Intercept) 4.2932252 0.1107388 38.769 0.0043051 0.0054040 0.797 0.426 Item\_Weight Item\_Fat\_ContentRegular -0.0275543 0.0412715 -0.668 0.505 Item\_Visibility 0.1341072 0.2381518 0.563 0.573 Item\_TypeBreads 0.0522367 0.1196013 0.437 0.662 0.0724449 0.1479823 0.490 0.625 Item\_TypeBreakfast Item\_TypeCanned 0.0572337 0.0932896 0.614 0.540 -0.981 -0.0862448 0.0879408 0.327 Item\_TypeDairy Item\_TypeFrozen Foods -0.0977249 0.0855095 -1.1430.253 0.0792261 Item\_TypeFruits and Vegetables -0.0164603 -0.2080.835 Item\_TypeHard Drinks -0.1825135 0.1364763 -1.337 0.181 0.355 Item\_TypeHealth and Hygiene 0.0898976 0.0970880 0.926 -0.178 0.859 -0.0151311 0.0851421 Item\_TypeHousehold 0.1532156 0.0960805 1.595 0.111 Item\_TypeMeat -0.0769605 0.1305123 -0.5900.556 Item\_TypeOthers Item\_TypeSeafood -0.2148837 0.1949377 -1.1020.271 0.0797618 -0.2030.839 Item\_TypeSnack Foods -0.0161790 Item\_TypeSoft Drinks -0.0178927 0.1021161 -0.1750.861 -0.1623765 0.1738742 -0.934 0.351 Item\_TypeStarchy Foods <2e-16 \*\*\* Item\_MRP 0.0084788 0.0002893 29.310 Outlet\_IdentifierOUT019 0.0172132 0.0533067 0.323 0.747 Outlet\_SizeMedium -0.129 -0.0078393 0.0607452 0.897 Outlet\_SizeSmall 0.0123712 0.0600306 0.837 0.206 Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

#### • Convenience Store



# **Outlet Size**

# • Large



#### Residuals:

Min 1Q Median 3Q Max -2.20800 -0.30370 0.08092 0.39175 1.38951

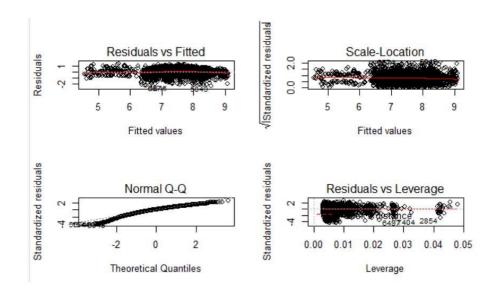
#### Coefficients:

		Std. Error	t value	Pr(> t )	
(Intercept)	4.3543066			< 2e-16	***
Item_Weight	-0.0022315	0.0027318	-0.817	0.41411	
Item_Fat_ContentRegular	0.0227696	0.0289479	0.787	0.43163	
<pre>Item_Visibility</pre>	0.2259986	0.2568896	0.880	0.37910	
Item_TypeBreads	-0.0114508	0.0823205	-0.139	0.88938	
Item_TypeBreakfast	-0.3241263	0.1167794	-2.776	0.00556	**
Item_TypeCanned	-0.0004785	0.0650579	-0.007	0.99413	
Item_TypeDairy	-0.0949131	0.0636698	-1.491	0.13620	
Item_TypeFrozen Foods	-0.0664185	0.0598572	-1.110	0.26730	
<pre>Item_TypeFruits and Vegetables</pre>	-0.0140699	0.0558825	-0.252	0.80124	
Item_TypeHard Drinks	-0.0255887	0.0896562	-0.285	0.77536	
Item_TypeHealth and Hygiene	-0.0474692	0.0679937	-0.698	0.48517	
Item_TypeHousehold	-0.0788625	0.0610528	-1.292	0.19661	
Item_TypeMeat	0.0241771	0.0724307	0.334	0.73857	
Item_TypeOthers	0.0343313	0.1095313	0.313	0.75398	
Item_TypeSeafood	-0.3722076	0.1511940	-2.462	0.01391	*
Item_TypeSnack Foods	0.0118753	0.0564630	0.210	0.83344	
Item_TypeSoft Drinks	0.0646379	0.0723467	0.893	0.37173	
Item_TypeStarchy Foods	-0.0460683	0.1037856	-0.444	0.65718	
Item_MRP	0.0086298	0.0002010	42.925	< 2e-16	***
Outlet_IdentifierOUT013	1.9383182	0.0416441	46.545	< 2e-16	***
Outlet_IdentifierOUT017	1.9792572	0.0465159	42.550	< 2e-16	***
Outlet_IdentifierOUTO45	1.9113618	0.0462240	41.350	< 2e-16	***

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.5583 on 1975 degrees of freedom Multiple R-squared: 0.6956, Adjusted R-squared: 0.6923 F-statistic: 205.2 on 22 and 1975 DF, p-value: < 2.2e-16

### • Medium



Residuals: Min 1Q Median 3Q Max -2.29198 -0.28179 0.06321 0.35779 1.35648

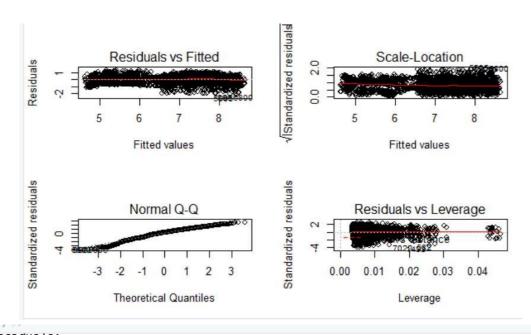
# Coefficients:

coefficients.					
	Estimate	Std. Error	t value		
(Intercept)	4.3108179	0.0659202	65.394	<2e-16	***
Item_Weight	0.0027818	0.0022541	1.234	0.2172	
Item_Fat_ContentRegular	-0.0029531	0.0203485	-0.145	0.8846	
Item_Visibility	0.0691021	0.1941442	0.356	0.7219	
Item_TypeBreads	-0.0042719	0.0621792	-0.069	0.9452	
Item_TypeBreakfast	-0.0470501	0.0880230	-0.535	0.5930	
Item_TypeCanned	0.0129717	0.0453560	0.286	0.7749	
Item_TypeDairy	-0.0601217	0.0455451	-1.320	0.1869	
Item_TypeFrozen Foods	-0.0789171	0.0433595	-1.820	0.0688	
<pre>Item_TypeFruits and Vegetables</pre>	0.0201149	0.0396037	0.508	0.6116	
Item_TypeHard Drinks	-0.0372855	0.0629936	-0.592	0.5540	
Item_TypeHealth and Hygiene	0.0311430	0.0489478	0.636	0.5247	
Item_TypeHousehold	0.0153764	0.0436258	0.352	0.7245	
Item_TypeMeat	0.0383628	0.0505891	0.758	0.4483	
Item_TypeOthers	0.0846805	0.0739581	1.145	0.2523	
Item_TypeSeafood	0.0369545	0.1083755	0.341	0.7331	
Item_TypeSnack Foods	-0.0043130	0.0398780	-0.108	0.9139	
Item_TypeSoft Drinks	-0.0301967	0.0510102	-0.592	0.5539	
Item_TypeStarchy Foods	-0.0798980	0.0753365	-1.061	0.2890	
Item_MRP	0.0083422	0.0001432	58.272	<2e-16	
Outlet_IdentifierOUT017	2.0046152	0.0539730	37.141	<2e-16	***
Outlet_IdentifierOUT018	1.8056426	0.0462211	39.065	<2e-16	***
Outlet_IdentifierOUT027	2.5148328	0.0462700	54.351	<2e-16	***
Outlet_IdentifierOUTO45	1.9515155	0.0549448	35.518	<2e-16	***
Outlet_IdentifierOUTO49	2.0170818	0.0462180	43.643	<2e-16	***
Ciamifd 0 (***) 0 001	( a a 1 ) 0 01 ( s	41 A AF ( )	0167	1	

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.5169 on 3401 degrees of freedom Multiple R-squared: 0.6643, Adjusted R-squared: 0.6619 F-statistic: 280.4 on 24 and 3401 DF, p-value: < 2.2e-16

# Small



Residuals: Min 1Q Median 3Q Max -2.18362 -0.30860 0.07206 0.39115 1.34751

#### Coefficients:

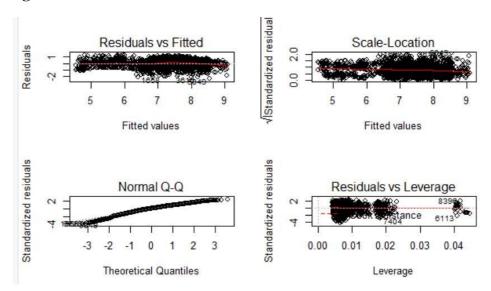
COETTICIENTS.				
	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	4.4720563	0.0703033	63.611	<2e-16 ***
Item_Weight	-0.0024053	0.0023254	-1.034	0.3010
Item_Fat_ContentRegular	0.0216129	0.0227207	0.951	0.3416
<pre>Item_Visibility</pre>	-0.3241091	0.1851325	-1.751	0.0801 .
Item_TypeBreads	0.0933882	0.0676990	1.379	0.1679
Item_TypeBreakfast	0.0700147	0.0906788	0.772	0.4401
Item_TypeCanned	0.0569792	0.0499401	1.141	0.2540
Item_TypeDairy	-0.0626549	0.0491853	-1.274	0.2028
Item_TypeFrozen Foods	-0.0222953	0.0464535	-0.480	0.6313
<pre>Item_TypeFruits and Vegetables</pre>	-0.0246571	0.0443887	-0.555	0.5786
Item_TypeHard Drinks	0.0019146	0.0773196	0.025	0.9802
Item_TypeHealth and Hygiene	0.0254676	0.0556640	0.458	0.6473
Item_TypeHousehold	-0.0387122	0.0477792	-0.810	0.4179
Item_TypeMeat	0.0028002	0.0572233	0.049	0.9610
Item_TypeOthers	-0.0845137	0.0733259	-1.153	0.2492
Item_TypeSeafood	0.2087678	0.1170116	1.784	0.0745 .
Item_TypeSnack Foods	-0.0042631	0.0444028	-0.096	0.9235
Item_TypeSoft Drinks	-0.0646398	0.0556456	-1.162	0.2455
Item_TypeStarchy Foods	-0.0256809	0.0824280	-0.312	0.7554
Item_MRP	0.0081128	0.0001593	50.938	<2e-16 ***
Outlet_IdentifierOUT017	1.9959140	0.0552533	36.123	<2e-16 ***
Outlet_IdentifierOUT019	0.0190217	0.0497629	0.382	0.7023
Outlet_IdentifierOUT035	1.9910496	0.0477766	41.674	<2e-16 ***
Outlet_IdentifierOUTO45	1.8995532	0.0550145	34.528	<2e-16 ***
Outlet_IdentifierOUTO46	1.9287031	0.0477710	40.374	<2e-16 ***
cianif codoc. O (***) O 001	( ** 1 O O1 ( *	*' O OE ' '	011	1

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.546 on 3074 degrees of freedom Multiple R-squared: 0.7585, Adjusted R-squared: 0.7566 F-statistic: 402.2 on 24 and 3074 DF, p-value: < 2.2e-16

# **Fat Content**

# • Regular



#### Residuals:

Min 1Q Median 3Q Max -2.29271 -0.28297 0.06149 0.37359 1.29713

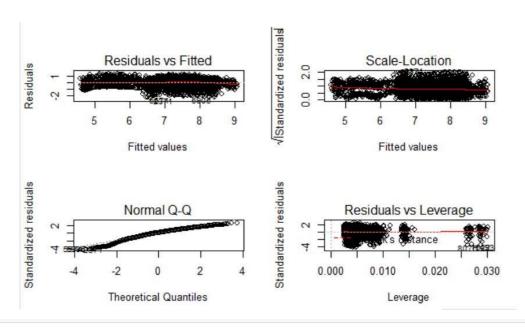
#### Coefficients:

Coefficients.					
	Estimate	Std. Error	t value	Pr(> t )	
(Intercept)	4.3788297	0.0629798	69.528	<2e-16	***
Item_Weight	0.0009840	0.0023493	0.419	0.6754	
Item_Visibility	-0.3264398	0.1956165	-1.669	0.0953	
Item_TypeBreads	-0.0447782	0.0590271	-0.759	0.4481	
Item_TypeBreakfast	-0.0942125	0.0708949	-1.329	0.1840	
Item_TypeCanned	-0.0142349	0.0427174	-0.333	0.7390	
Item_TypeDairy	-0.0542828	0.0445850	-1.218	0.2235	
Item_TypeFrozen Foods	-0.0587995	0.0399931	-1.470	0.1416	
<pre>Item_TypeFruits and Vegetables</pre>	-0.0057471	0.0372344	-0.154	0.8773	
Item_TypeMeat	0.0201797	0.0449051	0.449	0.6532	
Item_TypeSeafood	0.0241836	0.1074584	0.225	0.8220	
Item_TypeSnack Foods	-0.0346377	0.0381505	-0.908	0.3640	
Item_TypeSoft Drinks	-0.1227833	0.0700552	-1.753	0.0798	
Item_TypeStarchy Foods	0.0246556	0.0722005	0.341	0.7328	
Item_MRP	0.0083738	0.0001584	52.876	<2e-16	***
Outlet_IdentifierOUT013	1.9371745	0.0490176	39.520	<2e-16	***
Outlet_IdentifierOUT017	2.0414676	0.0488509	41.790	<2e-16	***
Outlet_IdentifierOUT018	1.7880086	0.0488338	36.614	<2e-16	***
Outlet_IdentifierOUT019	0.0556336	0.0549404	1.013	0.3113	
Outlet_IdentifierOUT027	2.5320155	0.0489360	51.741	<2e-16	***
Outlet_IdentifierOUT035	2.0314888	0.0490938	41.380	<2e-16	***
Outlet_IdentifierOUTO45	1.9720896	0.0491593	40.116	<2e-16	***
Outlet_IdentifierOUTO46	2.0104355	0.0488758	41.134	<2e-16	***
Outlet_IdentifierOUTO49	1.9901703	0.0487432	40.830	<2e-16	***
-:: C 0 (www.1 0 001	( ) 0 01 ( .	41 A AF ( )	0161	1	

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.5332 on 2982 degrees of freedom Multiple R-squared: 0.7336, Adjusted R-squared: 0.7315 F-statistic: 356.9 on 23 and 2982 DF. p-value: < 2.2e-16

### Low Fat



## Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	4.3996432	0.0506412	86.879	<2e-16 ***
Item_Weight	-0.0014652	0.0017340	-0.845	0.398
Item_Visibility	0.0806017	0.1497235	0.538	0.590
Item_TypeBreads	0.0866950	0.0545286	1.590	0.112
Item_TypeBreakfast	-0.0322486	0.0897036	-0.360	0.719
Item_TypeCanned	0.0556865	0.0418466	1.331	0.183
Item_TypeDairy	-0.0751772	0.0399667	-1.881	0.060 .
Item_TypeFrozen Foods	-0.0497896	0.0392625	-1.268	0.205
<pre>Item_TypeFruits and Vegetables</pre>	-0.0058404	0.0368006	-0.159	0.874
Item_TypeHard Drinks	-0.0127703	0.0475414	-0.269	0.788
Item_TypeHealth and Hygiene	0.0235022	0.0381133	0.617	0.537
Item_TypeHousehold	-0.0136790	0.0349442	-0.391	0.695
Item_TypeMeat	0.0165526	0.0510836	0.324	0.746
Item_TypeOthers	0.0153000	0.0511809	0.299	0.765
Item_TypeSeafood	0.0016112	0.0937171	0.017	0.986
Item_TypeSnack Foods	0.0246204	0.0364732	0.675	0.500
Item_TypeSoft Drinks	0.0058996	0.0408707	0.144	0.885
Item_TypeStarchy Foods	-0.1045688	0.0669050	-1.563	0.118
Item_MRP	0.0082644	0.0001184	69.790	<2e-16 ***
Outlet_IdentifierOUT013	1.9312418	0.0365120	52.893	<2e-16 ***
Outlet_IdentifierOUT017	1.9639597	0.0365938	53.669	<2e-16 ***
Outlet_IdentifierOUT018	1.7831535	0.0365933	48.729	<2e-16 ***
Outlet_IdentifierOUT019	0.0133936	0.0407579	0.329	0.742
Outlet_IdentifierOUT027	2.4727154	0.0365586	67.637	<2e-16 ***
Outlet_IdentifierOUTO35	2.0037141	0.0364731	54.937	<2e-16 ***
Outlet_IdentifierOUTO45	1.8859426	0.0364705	51.711	<2e-16 ***
Outlet_IdentifierOUTO46	1.9189585	0.0365697	52.474	<2e-16 ***
Outlet_IdentifierOUTO49	1.9995204	0.0366172	54.606	<2e-16 ***

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.54 on 5489 degrees of freedom Multiple R-squared: 0.7158, Adjusted R-squared: 0.7144 F-statistic: 512.1 on 27 and 5489 DF, p-value: < 2.2e-16

# **4.3.2 Results**

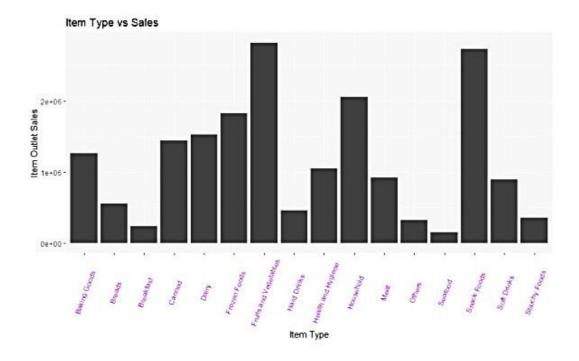
The below table gives summary of the analysis and indicates what all variables are useful in the best fit model.

Tables 7.1 Different variables wise categorization regression

Variables Cons	idered	$\mathbb{R}^2$	Adjusted R <sup>2</sup>
Item type, Item we	eight, Item fat content, Item	0.7214	0.7205
visibility, Item MR	RP, Outlet Identifier		
<b>Location Wise:</b>	a.) Tier 1	0.7539	0.7518
	b.) Tier 2	0.4932	0.4893
	c.) Tier 3	0.7675	0.7659
Outlet type wise: a	a.) Departmental	0.4828	0.4806
	b.) Specialty	0.4764	0.4655
	c.) Convenience	0.5634	0.5548
	d.) Grocery	0.4582	0.4480
Outlet size wise:	a.) Large	0.6956	0.6953
1	b.) Medium	0.6643	0.6619
	c.) Small	0.7585	0.7566
Fat content wise :	a.) Regular	0.7336	0.7315
	b.) Low Fat	0.7158	0.7144

# 4.3 Shelf Spacing

The location of a product in a shop can make a crucial difference to its sales. Manufacturers are no longer content merely to book an order with the retailer. They train their salesmen to ensure that their product is on display with maximum visibility to the shopper. A recent study in national supermarkets confirms that the way products are shelfed affects consumer purchasing behaviour Traditionally, "eye-level" shelving is best followed by "waist-level", "knew-level" and "ankle-level" it is near impossible to locate all the items at eye-level and store experience have proved that consumer responses to shelf locations depend upon such other factors as the product package size, whether or not it's being advertised, its need for visibility and intended market segment. In the middle range of shelving heights visibility variation becomes the major influence on product sales.



- Those items which have good sales can be put at eye-level or waist-level so as to increase their sales to a significant level.
- Items such as Baking Goods, Breads, Dairy, Canned Foods, Soft Drinks and Health and Hygiene items can be allotted more shelf space so as to increase their sales even more.

# **CHAPTER 5: CONCLUSION**

Major attributes are found in the above study that are affecting item sales of a multi-chain retail store. The methodology adopted descriptive modelling using tableau and predictive modelling using R studio. According to Muhamad Jantan and Abdul Razak Kamaruddin, location and price are the most important attributes for the store choice by customers.

In this study similar results are present that there are six major factors that effects the sales. These factors include item visibility, item type, item fat content, outlet identifier, item weight and item MRP. The study will help strategists and retailers to plan and formulate strategies which will increase outlet sales and will help in inventory controls.

- ➤ <u>Size of store</u>: Medium size stores having highest sale and large sized have least sales.
- Location of store: In total tier 3 have highest sales and tier 1 having lowest sales.
- Type of product: Different products have different sales, highest being fruits and vegetables and lowest being seafoods.
- Yes Type of store: Departmental store in tier 1 and 2 and convenience store tier 3 have maximum sales. Grocery stores have lowest sales.
- Weight of product: Firstly, sales increased with increase in weight of a particular product after a point, i.e., 12.86 in most cases in starts decreasing.
- Fat content: Low fat products sold more than regular fat products in all type of stores and in all tier cities.

# **CHAPTER 6: RECOMMENDATIONS**

According to the above analysis, I recommend the following to the multi chain store:

- ➤ Low fat products should be kept more in number because people are becoming more conscious about their health and preferring low fat content food samples specially in tier 1 cities.
- ➤ The company should stock item of weight around 12 to 13 kg in general.
- The front part of shelf space should be occupied by items generating more sales, i.e., fruits and vegetables then snack and then household items and so on.
- ➤ The expansion of stores generating high revenue, i.e., departmental stores and convenience stores.
- Expansion of more medium and small stores as they generate more revenue.
- ➤ Increased assortment of products by following:
  - The few varieties of products can be increased to keep in stores which are already high in sales in medium and large sized stores.
  - Many variations of a particular product can also be added in small sized stored
  - By grouping together items that they believe would appeal to certain types of customers, retailers may fine-tune their assortment strategies to target consumers' demographic profiles. Example new parents for infant apparels.
  - A strategically arranged product assortment can upsell customers on supplemental items as they search for the thing that brought them to the store.
- ➤ Grouping related items together strategically, whether or not they are necessities, is a common way to stimulate impulse buying. Example bread with butter.
- ➤ The sales in different tier cities are different, therefore as per the tier of the city the store should be expanded. In tier 1 departmental is maximum; In tier 2 departmental is maximum; In tier 3 convenience is maximum.

In addition to the above the company should:

- 1. The item visibility needs to be monitored to organize shelf spacing as it shows positive relationship with most of the items kept at waist or eye level. From the research this can be determined that establishment year have no effect on outlet sales. For inventor fruits and vegetable, snack foods are of maximum sale and seafoods and breakfast generate minimum sales so should be kept in minimum quantity or else could be avoided according to the outlet.
- 2. Departmental stores are much more popular among different type of cities and grocery store is least favorable. Tier 2 location generates maximum revenue. Convenience and specialty stores are popular in their respective locations only and could be encouraged in other locations as well. Medium and small sized stores are preferred more because generate maximum sales with minimum management cost.

# **CHAPTER 7: REFERNCES**

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# **FACULTY MENTOR APPROVAL**

