Εικόνα που περιέχει κείμενο

Περιγραφή που δημιουργήθηκε αυτόματα

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Business Report

SAS and MSc Information Systems and Services

University of Piraeus

Academic Specialization in

Data Management and Data Analytics

Milestone Project

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# Introduction

This business report presents various findings from data exploration and analysis of a retail shop. More specifically, the demographic and behavioral characteristics of the customers were explored to find the target audience. Afterward, the sales and promotions were examined to provide the necessary information for the financial status of the retail shop. Moreover, the customer profiles were analyzed with data analytics techniques to discover the categories of customers and which products are most important. In addition, research was done to promote a product to a sample of customers that want to buy this product using discount coupons. Finally, recommendations about the necessary organization acts were provided to become more efficient and effective in their operation.

# Findings

The total value of each invoice has been examined, taking into account all types of invoices. The results indicate that the average value of invoices is 964,93$. In addition, the invoice with the lowest and maximum value is 5,7$ and 8.603,77$, correspondingly. The total number of invoices in the period 2010-2011 was 24.214.

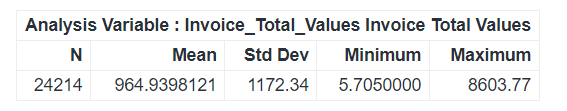


Figure 1 Statistics of invoices total values.

The customers with gender male are 70,16% of the sample, whereas the customers with gender female are 29,84%. Thus, most of the customers are male.

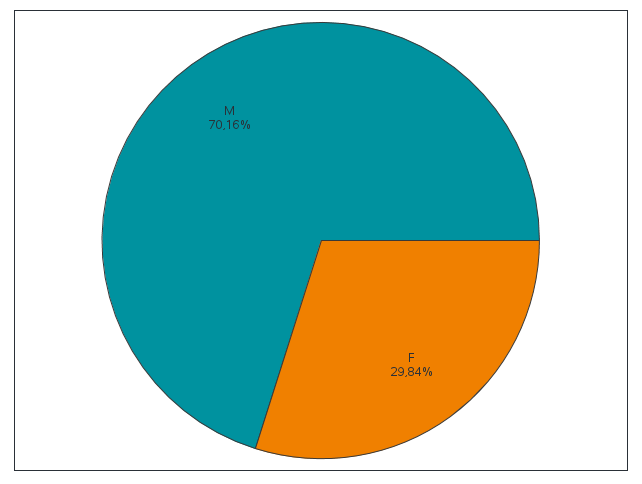


Figure 2 Pie chart with the gender of customers.

Most customers are in the region of Sao Paolo (3.476 customers), Rio de Janeiro (825 customers), and Minas Gerais (822 customers). The rest regions do not have a satisfactory number of customers. The low standard of living is an important factor. Moreover, the population of these regions is less than Southeast regions of Brazil like Sao Paolo, Rio de Janeiro, and Minas Gerais. Thus, the marketing department should investigate whether any promotional activity needs to be done in these areas.

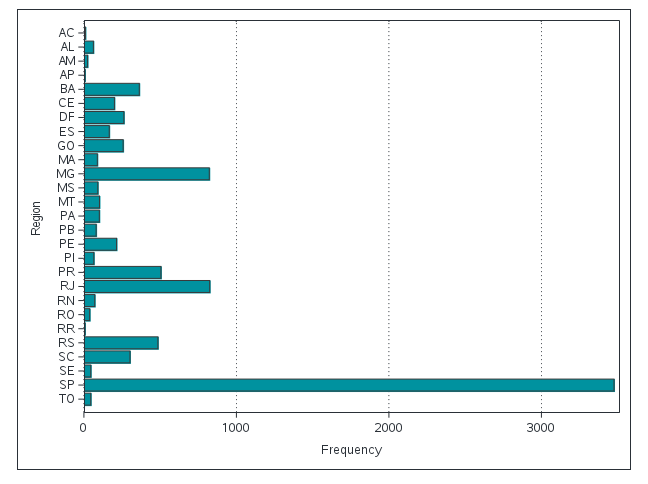


Figure 3 Customers of the retail shop in each region.

The age of most customers is between 28 and 45 years. The median age is 36 years and the average age is 36 years and 9 months. The results indicate that the retail shop is addressed to young and middle-aged people, whereas elderly customers are the minority. The age of most customers is between 28 and 45 years. The median age is 36 years and the average age is 36 years and 9 months. The results indicate that the retail shop is addressed to young and middle-aged people, whereas elderly customers are the minority. More specifically, young and middle-aged customers have a total percentage of 84,26%, whereas mature and elderly customers have a total percentage of 15,77%. In addition, young and middle-aged customers have spent 16.973.871,62$, whereas mature and elderly customers have spent 3.255.011,45$. It is worth mentioning that the mature and elderly groups are the minority of customers but make more expensive purchases. The young and middle-aged customers have visited the retail shop 18.096 visits, whereas mature and elderly customers have visited the retail shop 3.353 visits. Finally, all age groups of customers have bought all kinds of products from the retail shop. Consequently, the marketing department will have to decide if it wants to attract elderly customers because they spend lots of money on their purchases.

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Figure 4 The number of customers for each age group.

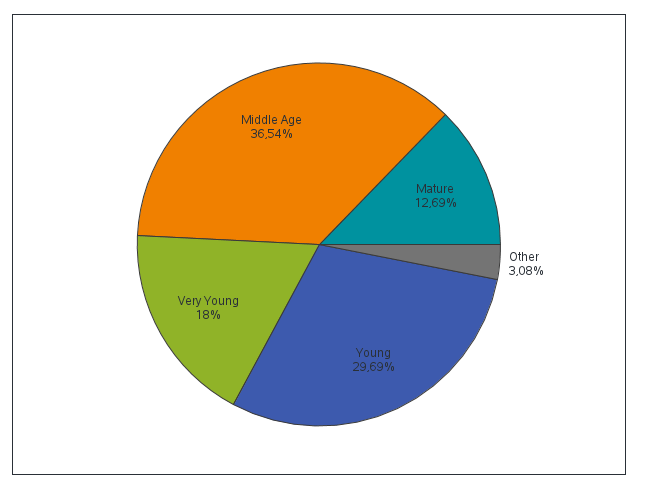


Figure 5 The percentages of customers per age group.

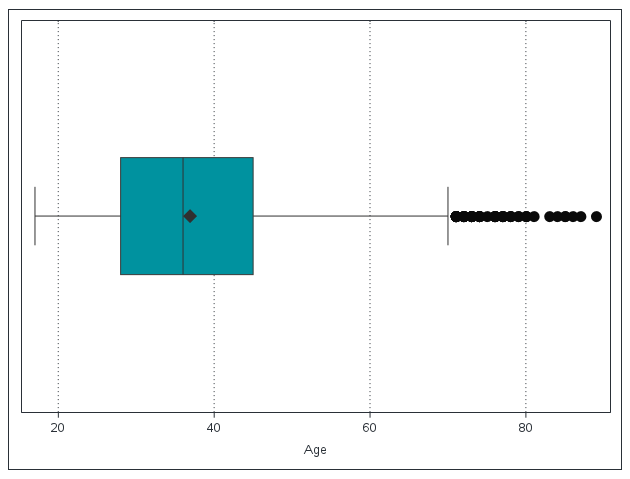


Figure 6 Boxplot with ages of customers.

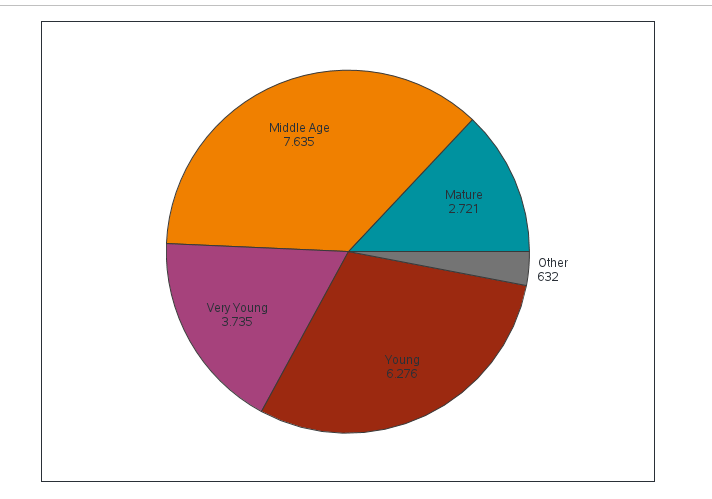


Figure 7 The visits of customers per age group.

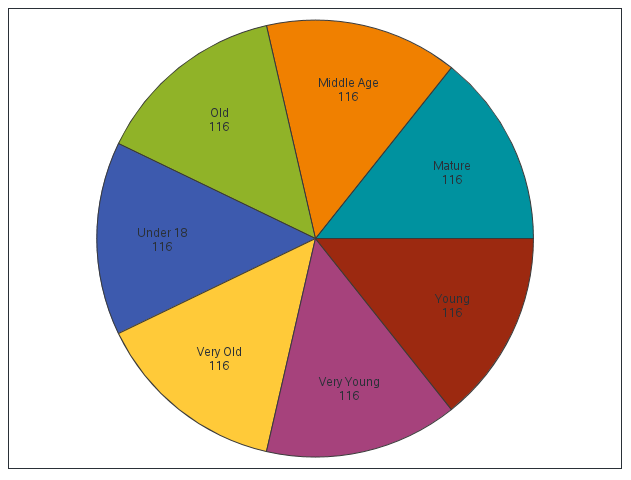


Figure 8 The number of SKUs purchased by age group.

In the period 2010-2011, the sales reached 19,6 million dollars, whereas the returns reached 3,27 million dollars, according to the bar chart of Figure 9. Thus, the benefits are 15,88 million dollars approximately. The customers buy two products per invoice. The invoice with the maximum number of products sold contains 303 products, whereas the invoice with the minimum number of products sold contains only one product.

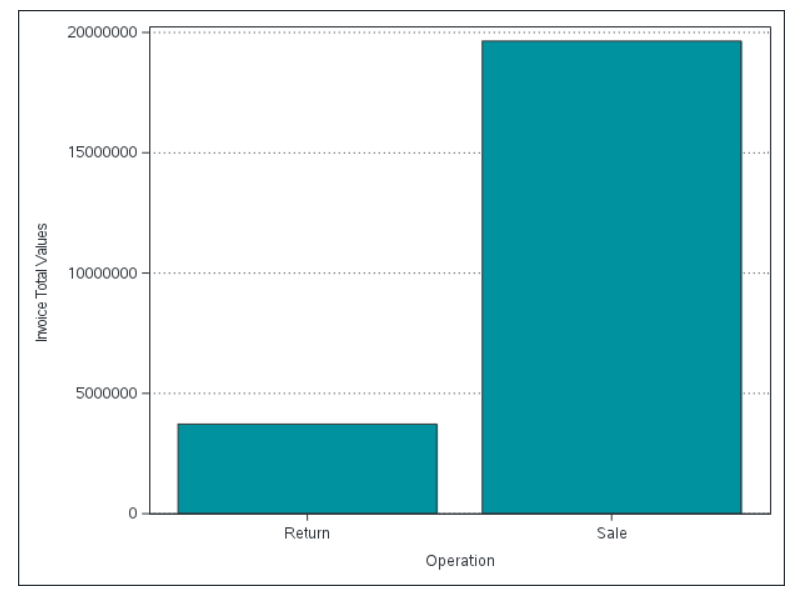


Figure 9 The monetary value of sales and returns.

For each day, the average basket size ranged between one to two products, according to the histogram in Figure 10. 57,77% of days have an average basket size of value two. The same is observed in the scatter plot of Figure 11, in which the majority of points are located near value 2.

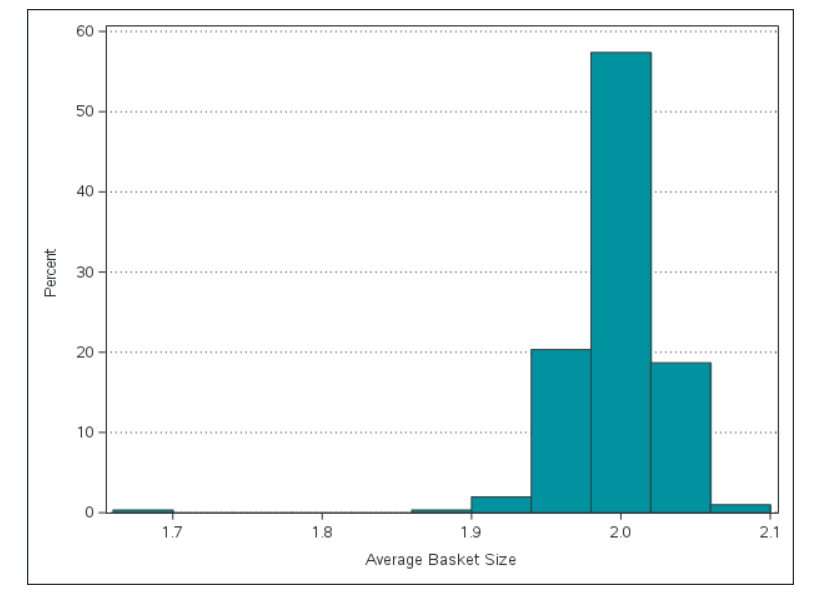


Figure 10 The histogram of average basket size per day.

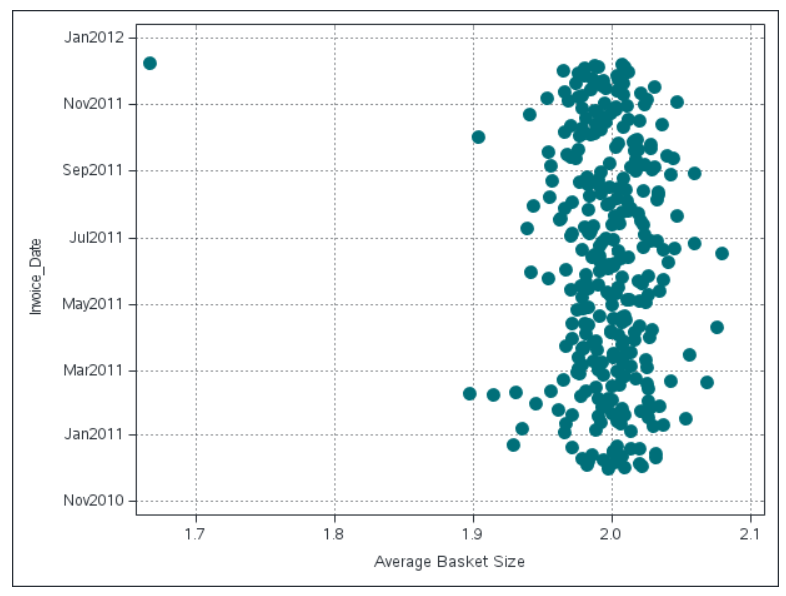


Figure 11 The scatter plot of average basket size per day.

The products that have the most sales are Eyewear (2.906.846,55$), Watches (2.024.325,73$), and Lanterns (1.886.076,90$). The products that have the fewest sales are Woods (590.351,76$), Safety (441.357,80$), and Putters (428.003,04$). In addition, the product line with the most sales is Personal Accessor (8.897.252,57$), whereas the product line with the fewest sales is Golf Equipment (428.003,04$). These results show that the products that belong to the Golf Equipment product line should be promoted.

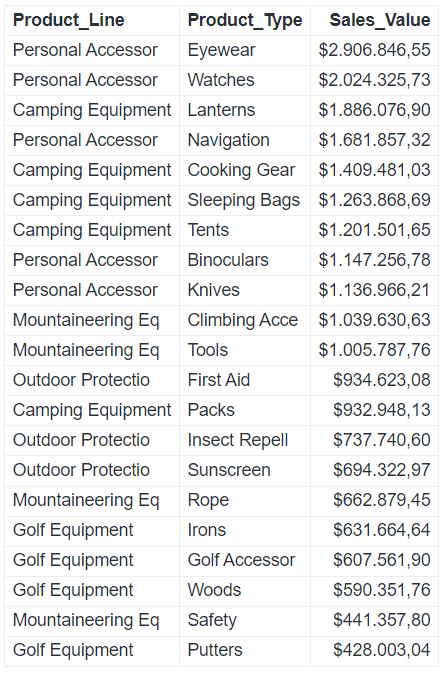


Figure 12 The monetary values of sales per product line and product type.

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Figure 13 The monetary value of sales per product line.

The region with the most sales is Sao Paolo (8.100.532,58$), whereas the region with the fewest sales is Amapa (7.620,04$). The results show that the southeast regions of Brazil contribute more to the retail profits, like Sao Paolo, Rio de Janeiro, and Rio Grande do Sul. In Sao Paolo, the majority of customers are male. Thus, the marketing department should attract more female customers in Sao Paolo.

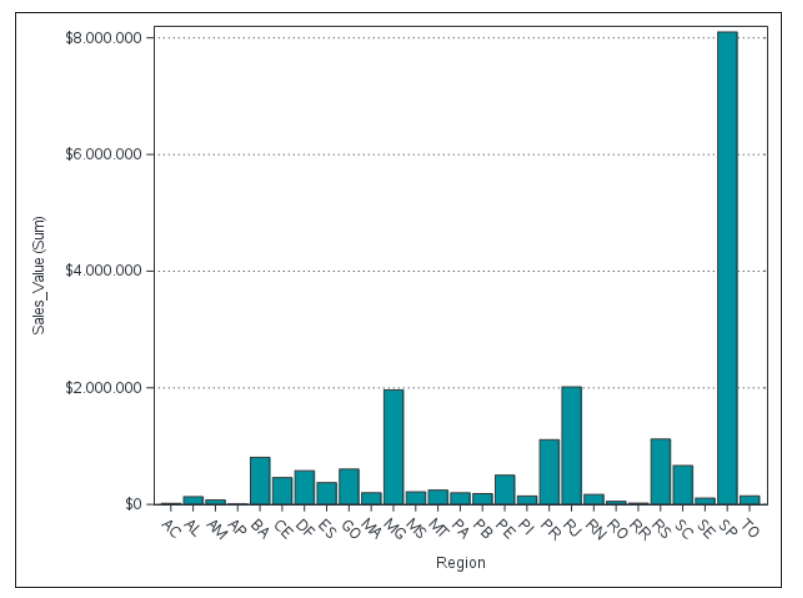


Figure 14 The monetary value of sales per region in bar chart.

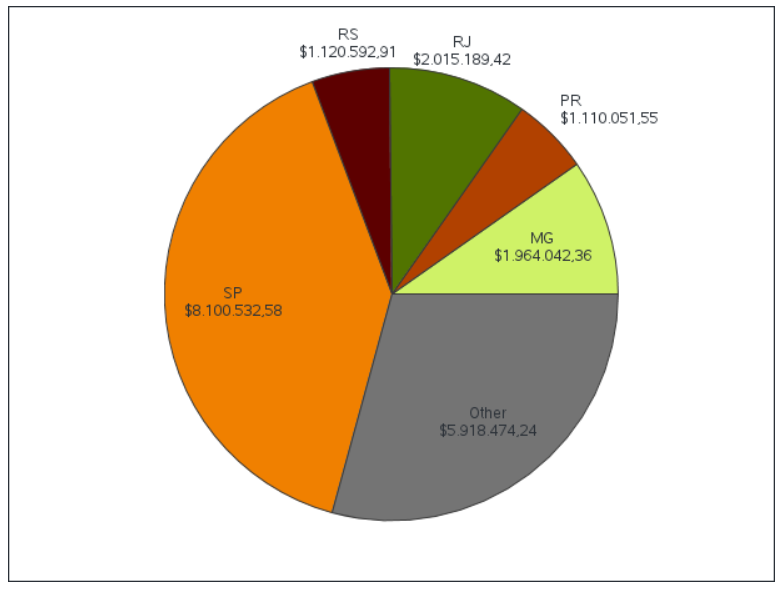


Figure 15 The monetary value of sales per region in pie chart.

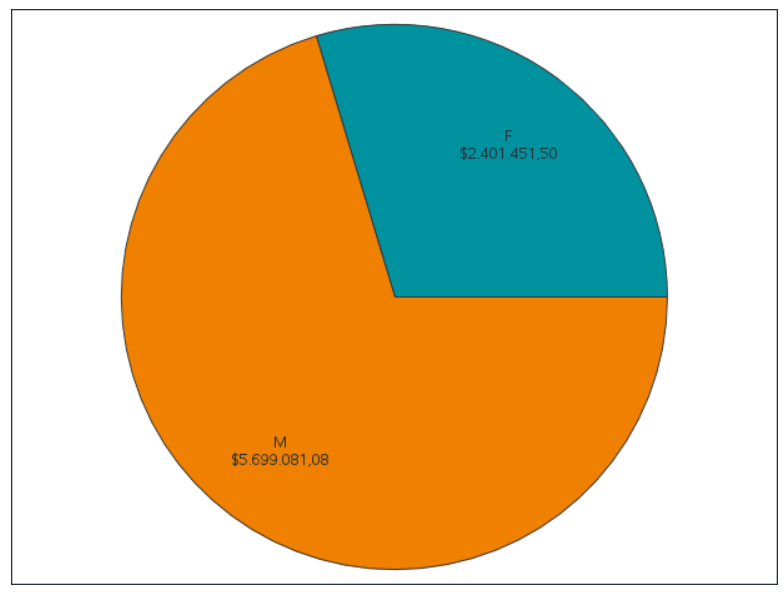


Figure 16 The monetary value of sales per gender in Sao Paolo region.

The number of products sold is 220.061 (62,5%) without promotion, whereas the number of products sold is 132.022 (37,5%) with promotion. In addition, the percentages for products with percentages of 10%, 20%, and 30% are equal, as shown in Figure 19. Thus, the customers consider that discounts are not a key factor in choosing the product, or the discounts are not notably satisfying to buy them.

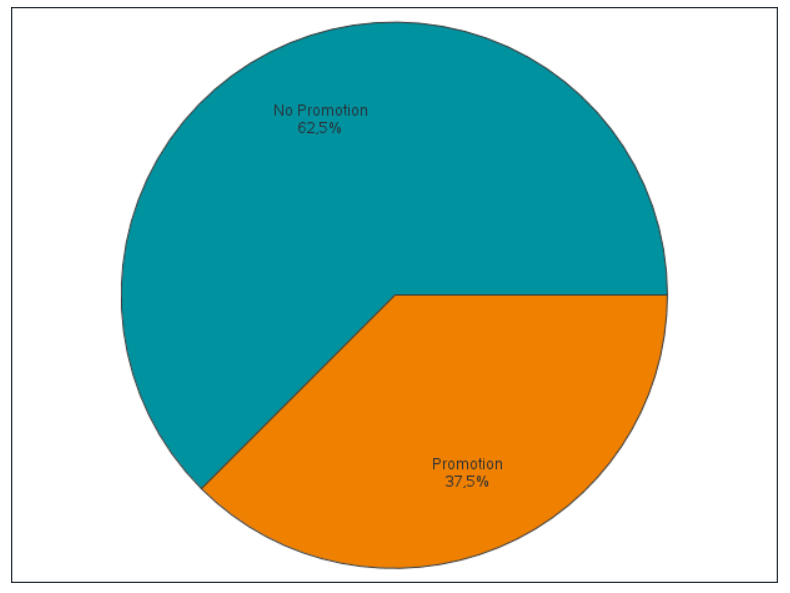


Figure 17 The percentage of products that are promoted and no promoted in pie chart.

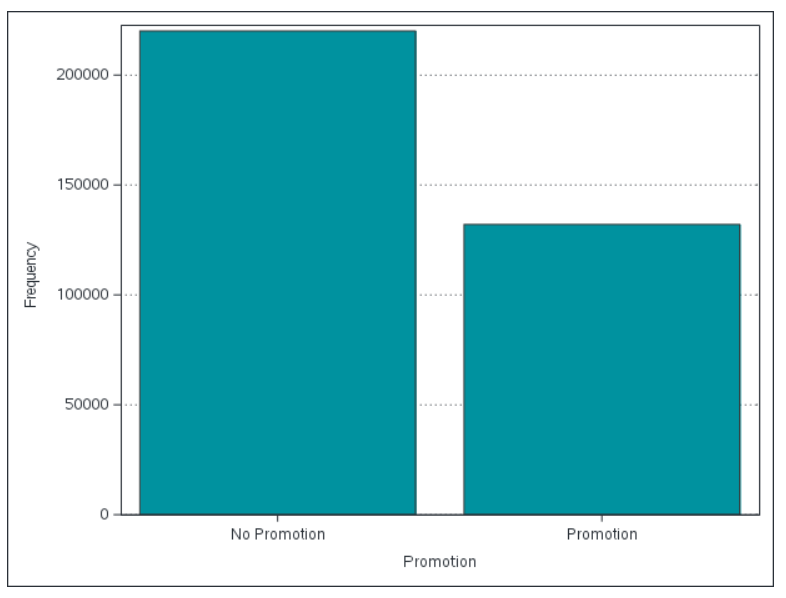


Figure 18 The number of products that are promoted and no promoted in bar chart.

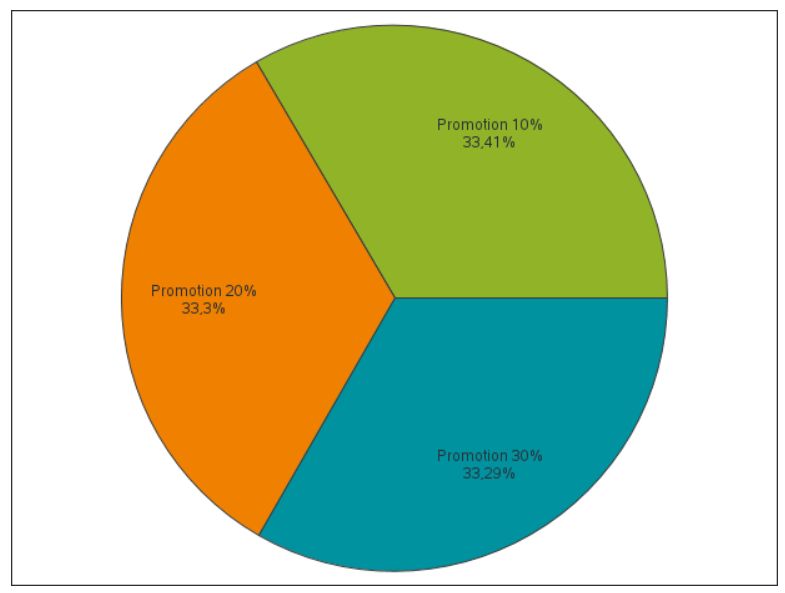


Figure 19 The percentage of promoted products per category.

The sales with a high monetary value are on Thursday (4.270.000$), whereas the sales with the lowest monetary value are on Saturday (0$). The monetary value of sales on Saturday is 0$ because the retail shop is closed on Saturdays. In figure 20, it is observed that all SKUs are sold, so there is no difference between different SKUs and sales.

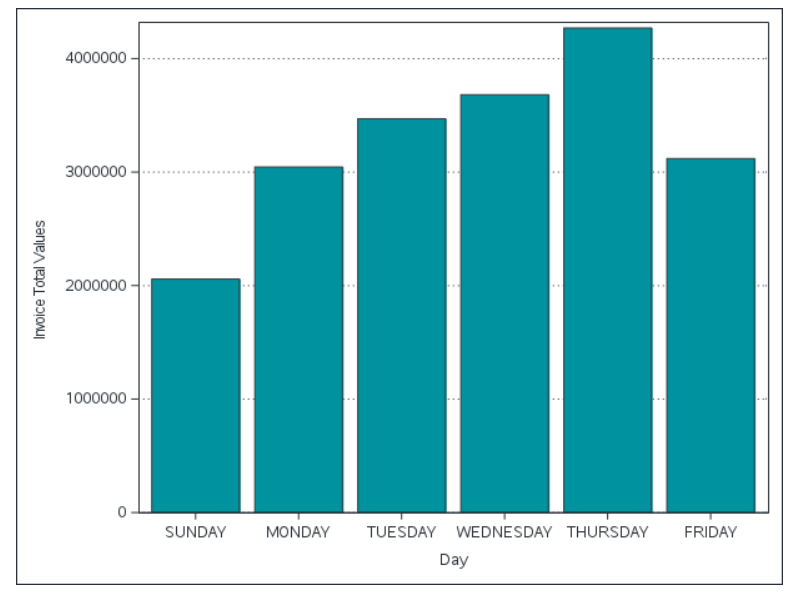


Figure 20 The sales per day of the week.

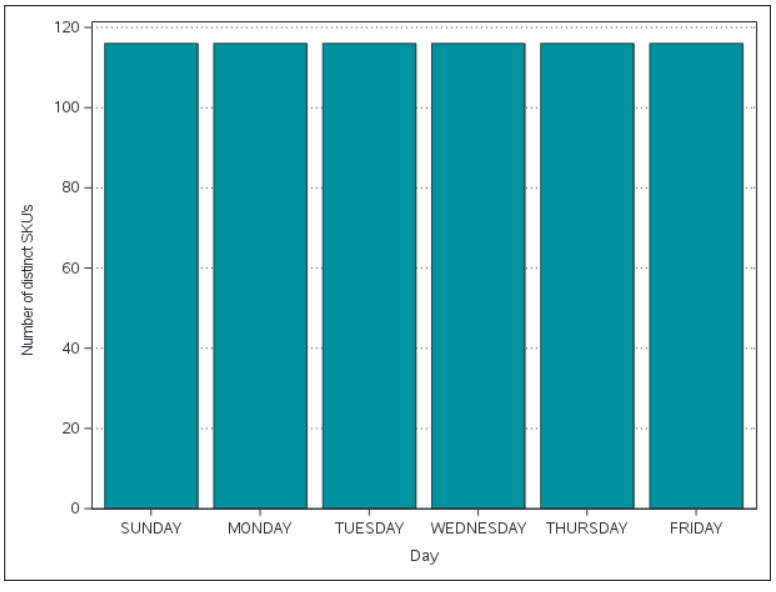


Figure 21 Different SKUs per day of the week.

The most products that have been sold are of the company Dragon SA. More specifically, the products that have been sold are 66.677, which consists the 15,92% of products sold. On the other hand, Easy Creator was the company with the fewest products sold. The Easy Creator products that have been sold are 34,988, which consists the 8,35% of products sold. The percentages of the products sold by the remaining companies are between 9 and 11 %. The Toktai and Chen products that have been sold are 60.790, which consists the 14.52% of the total products sold.

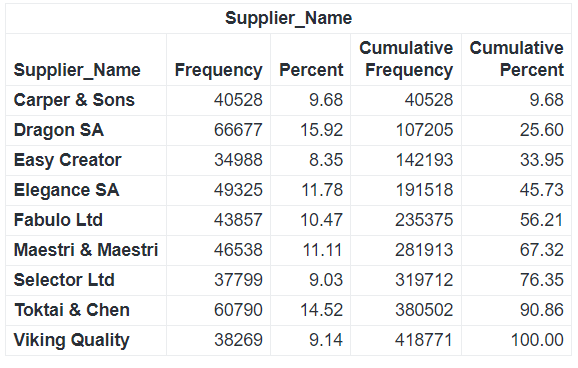


Figure 22 The frequency report of products sold.

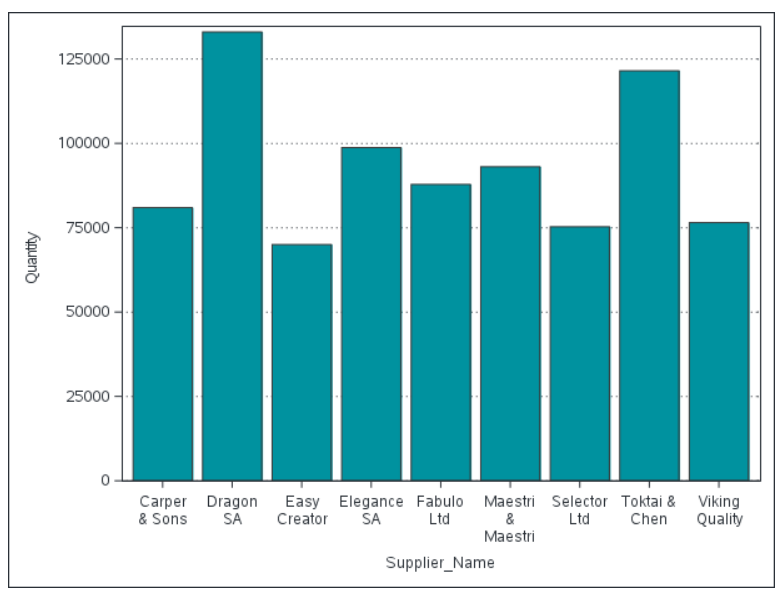


Figure 23 The quantity of products sold in bar chart

The company with the highest sales value is Dragon SA, at 3.809.087,42$ which consists the 16,3% of sales. Indeed, the company with the lowest sales value is Selector Ltd, at 1.913.426,29$ which consists the 8,2% of sales. The sales of the rest companies are between 2 to 3.1 million dollars.

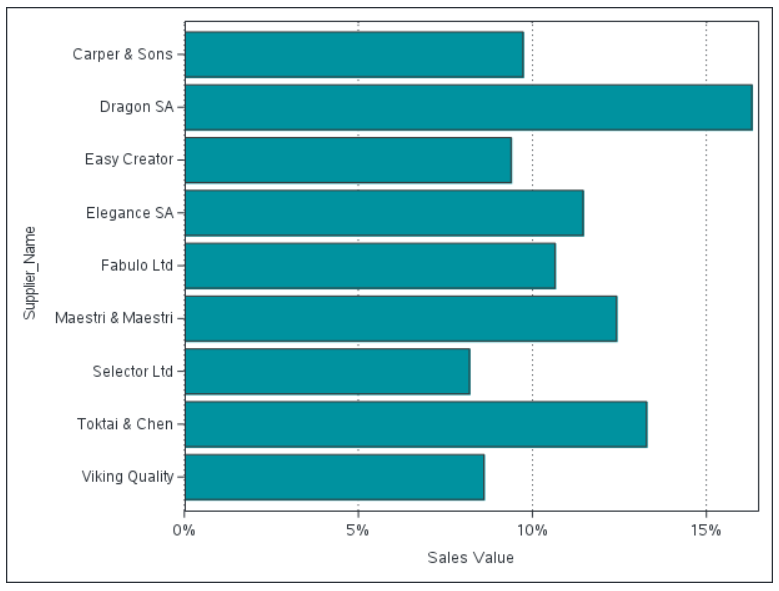


Figure 24 The percentage of sales per company.

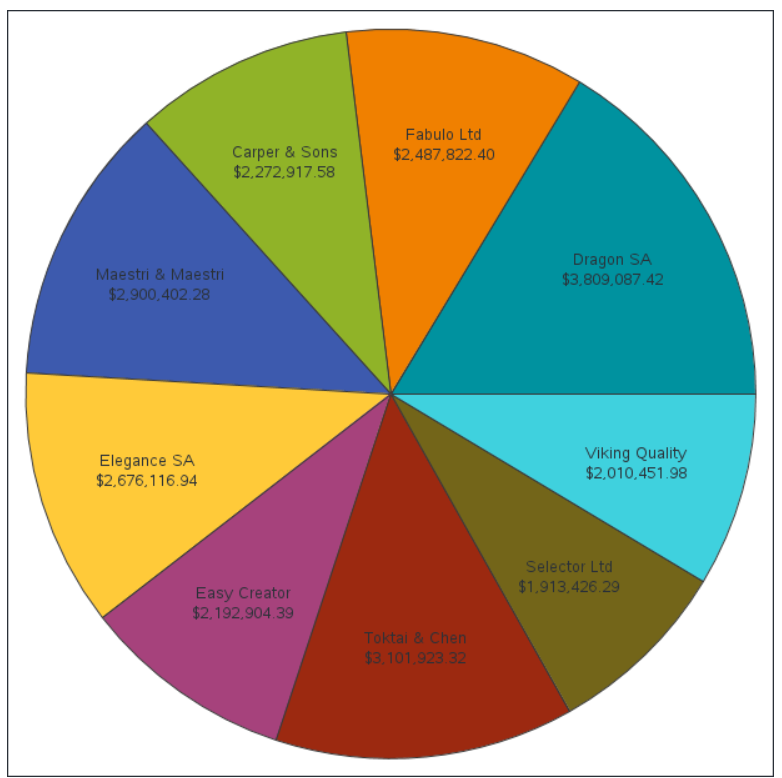


Figure 25 The value of sales per company.

The products of **Carper & Sons** that have been made in India, have the **highest** sales value at **$790,209.95**, whereas the products that have been made in Turkey have the **lowest** sales values at **$247,867.87**.

The products of **Dragon SA** that have been made in Spain have the **highest** sales values at **$900,410.39**, whereas the products that have been made in Turkey have the **lowest** sales values at **$643,193.34**.

The products of **Easy Creator** that have been made in China have the **highest** sales values at **$802,474.13**, whereas the products that have been made in Turkey have the **lowest** sales values at **$132,038.42**.

The products of **Elegance SA** that have been made in the China have the **highest** sales value at **$1,033,999.05,** whereas the products that have been made in India have the **lowest** sales value at **$96,527.05**.

The products of **Fabulo Ltd** that have been made in India have the **highest** sales values at **$931,715.44**, whereas the products that have been made in Spain have the **lowest** sales value at **$168,546.28**.

The products of **Maestri & Maestri** that have been made in Spain have the **highest** sales value at **$1,044,866.08**, whereas the products that have been made in China have the **lowest** sales value at **$67,752.30**.

The products of **Selector Ltd** that have been made in Spain have the **highest** sales value at **$890,860.32**, whereas the products that have been made in China have the **lowest** sales value at **$91,108.40**.

The products of **Toktai & Chen** that have been made in China have the **highest** sales value at **$849,079.28**, whereas the products that have been made in Turkey have the **lowest** sales value at **$402,765.73**.

The products of **Viking Quality** that have been made in the USA have the **highest** sales value at **$664,172.77**, whereas the products that have been made in India have the **lowest** sales value at **$313,966.67**.

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Figure 26 The table with sales per products origin country and company.

# Conclusions

# Recommendations

# Appendix