**Assignment 1: Prestige Mall**

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**Case Study: Prestige Mall**

**What businesses have you here?**



One of the shops in this shopping centre, *Prestige Mall*, has become vacant. You were tasked by your boss to suggest a possible tenant to bring into the Mall.

Some decisions that we make may be based on personal judgments but some may not. In this case, a proposal with support from data collected is obviously more convincing as compared to a proposal without such a support or a proposal supported with personal judgments alone. What are some of the information that you would include in your proposal, as support to the kind of business (and thus the potential tenant) that you would like to recommend to your boss?

Well, for instance, you may like to have an initial “feel” of the profile of customers who patronize this mall:

* What kind of job sectors are they from?
* How many times do they frequent Prestige Mall in a month?
* How much do they typically spend in Prestige Mall?
* What is their age profile?
* What is the proportion of male customers of Prestige Mall?
* What is their average monthly household income?

The questions listed above would generate valuable information in helping you to decide on the potential tenant that you would like to recommend to your boss.

You will like a systematic way to approach this problem, thus you use the 4-steps **statistical problem-solving process** that you have been introduced:

Formulating  
Questions

Collecting  
Data

Analysing  
Data

Interpreting  
Results

In order to collect data, a selected group of customers of Prestige Mall is chosen to respond to a survey. By the end of the survey period, you have collected feedback from 200 customers. The data is recorded in the spreadsheet named *PrestigeMall\_Data.xlsx*.

You can refer to Q5 below on how to fill in the fields in the table that is designed in accordance to the 4-steps statistical problem-solving process.

Refer to *PrestigeMall\_Data.xlsx* and use Minitab to analyze the data.

Q1: What is the aim of this case study?

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| To suggest a suitable tenant to the shop |

Q2: What is the sample of this case study? And what is the targeted population?

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| Sample is 200 customers selected randomly during the survey period. Targeted population is customers in Prestige Mall |

Q3: How were the data collected, as recorded in the data file named “Prestige Mall”?

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| It was collected using a survey feedback form, to find out the person information |

Q4: What information (variables) does the data file named “Prestige Mall” hold?

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| Job sector, Age, No. of Visits/month, Gender, Household Income, Amount spent/ month |

Formulating Questions

Collecting Data

Analyzing Data

Interpreting Results

|  |  | **Define variable and type of data** | **Both Numerical and Graphical summaries to be included** | **Description of Sample and  Generalization to the target population**  **(Based on Q5-Q7 sample description)** |
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| Q5 | What is the proportion of male and female customers of Prestige Mall? | *Which variable would you use to answer this question?*  Gender  *What type of data are these?*  Qualitative (nominal) | **Male:** 43%  **Female:** 57% | ***Describing the sample:***  **For Q5:** There is a slightly higher proportion of female customers visiting Prestige Mall compared to male customers.  **For Q6:**  The mean age is 41.955, and the data is positively skewed. More customers are below 41.955 of age    **For Q7:**  The mean income is 8231.29. The data is again positively skewed, meaning more customers have an income that’s below 8231.29  ***Generalizing to the population:***  Generally, customers of Prestige Mall are slightly more likely to be female, more likely to be younger of age below 41.955, and more likely to have a household income below 8231.29 |
| Q6 | What is the age profile of the customers? | *Which variable would you use to answer this question?*  **Age**  *What type of data are these?*  *Quantitative (discrete)* | **Mean: 41.955**  **Median: 41.5**  **SD: 11.8611** |
| Q7 | What is the distribution of income of the customers? | *Which variable would you use to answer this question?*  **Household Income**  *What type of data are these?*  **Quantitative (continuous)** | **Mean: 8231.29**    **Median: 8067.36**  **SD: 1222.86** |

Formulating Questions

Collecting Data

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|  |  | **Define variable and type of data** | **Both Numerical and Graphical summaries to be included** | **Description of Sample and  Generalization to the target population**  **(Based on Q8-Q10 sample description)** |
| Q8 | What is the proportion of customers in the IT/Eng and Bus/Fin sectors? | *Which variable would you use to answer this question?*  Job sector  *What type of data are these?*  Qualitative (nominal) | **Bus/Fin: 59, 29.5%**  **IT/Eng: 103, 51.5%**  **Others: 38, 19.0%** | ***Describing the sample:***  **For Q8:**  Customers are mostly from IT/Eng backgrounds, followed by Bus/Fin then others backgrounds  **For Q9:**  Customers mostly go around 3-4 times per month. Most customers go more than 3.465 times per month  **For Q10:**  *Customers mostly spend about 501.202 per month. Most customers spend more than 501.202 per month*  ***Generalizing to the population:***  Most customers are from IT/ Eng backgrounds, go around 3-4 times per month, and spend about 501 each month |
| Q9 | How often do the customers visit Prestige Mall in the last month? | *Which variable would you use to answer this question?*  No. of Visits/ month  *What type of data are these?*  Quantitative (discrete) | **Mean: 3.465**  **Median: 4**  **SD: 1.74182** |
| Q10 | How much did the customers spent last month at Prestige Mall? | *Which variable would you use to answer this question?*  Amount spent/month  *What type of data are these?*  Quantitative data (Continuous) | **Mean: 501.202**  **Median: 503.11**  **SD: 137.843** |

Formulating Questions

Collecting Data

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|  |  | **Define variable and type of data** | **Both Numerical and Graphical summaries to be included** | **Description of Sample and  Generalization to the target population**  **(Based on Q11 sample description)** |
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| Q11 | Is there any preliminary evidence to claim that female customers who went to Prestige Mall  6 times last month spent very much more than female customers who went to Prestige Mall only once last month? | *Which variable would you use to answer this question?*  Amount spent/month for females who visit the mall once/ month  And amount spent/month for females who visit the mall six times/month  *What type of data are these?*  *Quantitative data (continuous)* | |  |  |  | | --- | --- | --- | | Amount spent/ month | Visit the mall once / month | Visit the mall  6 times / month | | *n* | **24** | 19 | | Mean | **470.419** | 492.241 | | SD | **155.8** | 127.2 | | Minimum | **188.59** | 271.49 | | Q1 | **398.64** | 406.34 | | Median (Q2) | **454.43** | 489.26 | | Q3 | **563.243** | 572.09 | | Maximum | **743.84** | 749.45 | | ***Describing the sample:***  Generally, even though both the plots are similar, the mean, minimum, Q1, Q2, Q3 and maximum are all slightly higher for 6 times/month than those who visit the mall once/month. The standard deviation shows that the results are consistently higher that those who visit the mall once/month    ***Generalizing to the population:***  People who went 6 times/month generally spend slightly more than those who went once /month |

Formulating Questions

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|  |  | **Define variable and type of data** | **Both Numerical and Graphical summaries to be included** | **Description of Sample and  Generalization to the target population**  **(Based on Q12 sample description)** |
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| Q12 | **Ask a question about the relationship between 2 variables, then proceed to investigate.**  **Is there a relationship between …**  Household income and amount spent/month | *Which variables would you use to answer this question?*  *Household income and amount spent per month*  *What type of data are these?*  Quantitative (continuous) |  | ***Describing the sample:***  Using the scatterplot, there doesn’t seem to be a correlation in between amount spent/month vs household income for the sample    ***Generalizing to the population:***  There isn’t a correlation in between amount spent/month vs household income |

Q13: Based on interpretations from Q5 to Q12, suggest a potential business to recommend to your boss, and thus a potential tenant (e.g Rolex?).   
 Note: You need not use all the interpretations.

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| Sephora. Since majority are women, having a skin and beauty care brand would be profitable. Additionally, IT/Eng employees generally have long working hours, and after a long day skin care is really important. Household income and amount spent/month doesn’t have much correlation, meaning to say people that visit the mall likely chooses to buy commodities that are necessary, and not items that are of a premium accessible to higher income households. Skin care falls into this category. |

Q14: State three assumptions that may be applicable in this case study.

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| -the samples are randomly selected  -there’s no promotion or ongoing discounts to skew the results  -it’s a normal season when they take the survey |

Q15: Given a chance to redesign the survey, suggest a possible new question (and thus a new variable) that can be added into the survey to gain more insight on the customers of Prestige Mall. Explain how this variable may affect your recommendation in Q13.

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| Formulating Question:  *Write down your new question for the survey here.*  What should be an event to be held in Prestige Mall  Collecting Data:  *What is the name of the variable you would use to answer this question?*  Marital Status  *What type of data is this?*  Qualitative (norminal)  Analyzing Data:  *What numerical summaries do you need?*  *Number of people who are single, married, or married with kids*  *What type of graphical summary do you need (i.e. pie chart, bar chart, histogram, boxplot?). Explain why you use this type of graphical summary.*  Pie chart. To find out the proportion of people in each marital status, so we can find out how to better attract people to the mall  Explain how this variable may affect your recommendation in Q13.  It may affect the recommendation of shop. If the audience is more family oriented, having a shop catered to family related goods might be more profitable |