UTM

UNIVERSITI TEKNOLOGI MALAYSIA

SCHOOL OF COMPUTING

SEMESTER II 2020/2021

SECI2143 – PROBABILITY AND STATISTIC DATA ANALYSIS

PROJECT 1

NAMA	NO MATRIK
Muhammad Aniq Aqil bin Azrai Fahmi	A20EC0083
Muhammad Naim bin Abdul Jalil	A20EC0096
Khairul Izzat bin Hashim	A20EC0058
Nur Afikah Binti Mohd Hayazi	A20EC0220

DR. NOR AZIZAH ALI

SUBMISSION DATE: 29th APRIL 2021

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Introduction

The use of Food Courier Service During Pandemic Covid -19 are the new norms we heard since the lockdown happened in Malaysia. First, the concept of food delivery has already taken place in the old generation and famous during the 1950s since back then most families love enjoying their meals at home. There are many similarities between the ancient and modern revolution of Food Delivery Services. On top of that, the world is shocked by the new virus's attack, which led to a total lockdown in Malaysia. All residents are not allowed to get out of the house freely without any good reasons and can't bring their families to have eaten at restaurants due to lockdown, so the alternatives are to order the Food via the food courier service such as Food Panda, Grab Food and others.

This study aims to collect data among Malaysian citizens on how frequently they used the services and determine whether the service is important. Since they are locked in the house and don't have enough time to prepare Food for their families due to the heavy workload while working from home or tired of cooking, they need some rest by just ordering Food to eat. We would also like to know which courier service the Malaysian frequently uses and decide which one is better and how Malaysian wants to give tips and pay the service to determine which method was the easiest and consider efficient.

We were interested in all these questions since we wanted to compare which area was the most to order Food with the service, either urban or rural, even though urban areas are most likely to order more. However, still excited to analyze the result of the survey. The payment method also the main concern as we want to know what most way used to pay. We also ask how many family members did their order to compare either more family members means more order or otherwise.

From the data that we will receive from the questionnaire, we expect that people at least had an experience buying using the Food Courier Service to give their honest answer for the survey. It would make us easier to analyze the data and provide accurate information from the data received.

Methodology

This survey aims to get responses from UTM students and outsiders at random. An online survey was conducted using Google Forms. Up to 105 people participated and answered questions, but only 96 out of 105 were valid. 13 questions were prepared by our group members.

The data was collected in Excel and imported into R studio. We use R programming language to analyze, summarize and present data using graphical representations in the forms of bar chart, boxplot, histogram, pie chart, steam and leaf, and ogive.

The following are the nominal scale variables that have been used in our data analysis:

Table 1: Norminal scale variables

Questions	Answers
Gender	Male / Female
Type of residential area	Urban / Rural
Food courier service	Food Panda, Grab Food, Bungkus It, Owned Brand Delivery Service, Halo
Order time	Breakfast, Lunch, Dinner
Payment method	Cash on Delivery / E-Wallet / Online Banking / Debit or Credit Card
Promotion	Food Panda / Grab Food / Bungkus It / Owned Brand Delivery Service/ Halo

Tips : '/' for single choice , ',' for multiple choice

The following are the ordinal/interval scale variables that have been used in our data analysis:

Table 2: Ordinal/interval scale variables

Questions	Answers
Rate of the food courier service	1 (very unsatisfied) to 5 (very satisfied)
Impact of the food courier service to the society	1 (bad impact) to 5 (good impact)

The following are the ratio scale variables that have been used in our data analysis:

Table 3 : Ratio scales variables

Questions	Answers
Age	Metric value
Family dependents	Metric value
Frequency of order in one month	Metric value
Price of one order	Metric value
Tips to the deliverer	Metric value

Data Analysis

After collecting all the data, we finally started making some graphs to analyze what does every data that we collect means and discuss what we got from the survey on The use of Food Courier Service During Pandemic Covid -19. Data are divided into two part which is Categorical and Quantitative.

Question 1

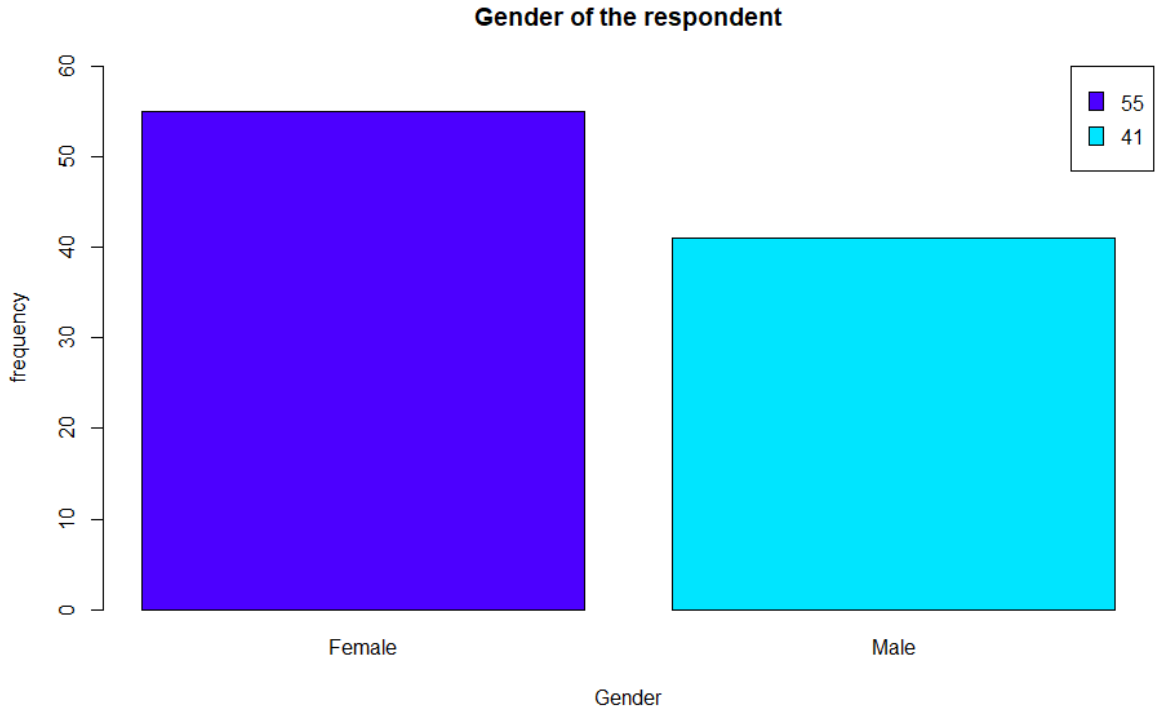


Figure 1: Bar Chart of Gender

Based on Figure 1, the bar chart above shows that among 96 people in this survey are females, in which 55 out of 96 people are female, and the rest are male.

Question 2

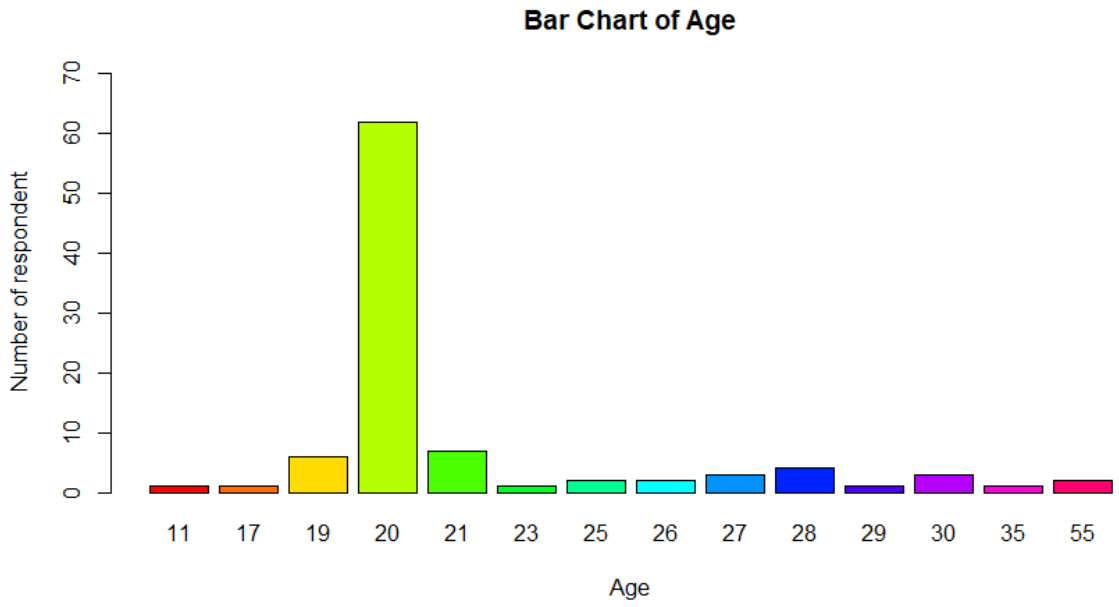


Figure 2: Bar Chart of Age

Age	Number of respondent
11 years old	1
17 years old	1
19 years old	6
20 years old	62
21 years old	7
23 years old	1
25 years old	2
26 years old	2
27 years old	3
28 years old	4
29 years old	1
30 years old	3
35 years old	1
55 years old	2

Table 4: Table of Age of the Respondent

Based on Figure 2, we can see a very wide range of age of respondents, which is 11 years old until 55 years old who filled up our surveys this means. In our green bar shows that respondents with 20 years old age are the highest. It may because of the survey had been shared mostly to our groups which mostly likely to be 20 years old of age.

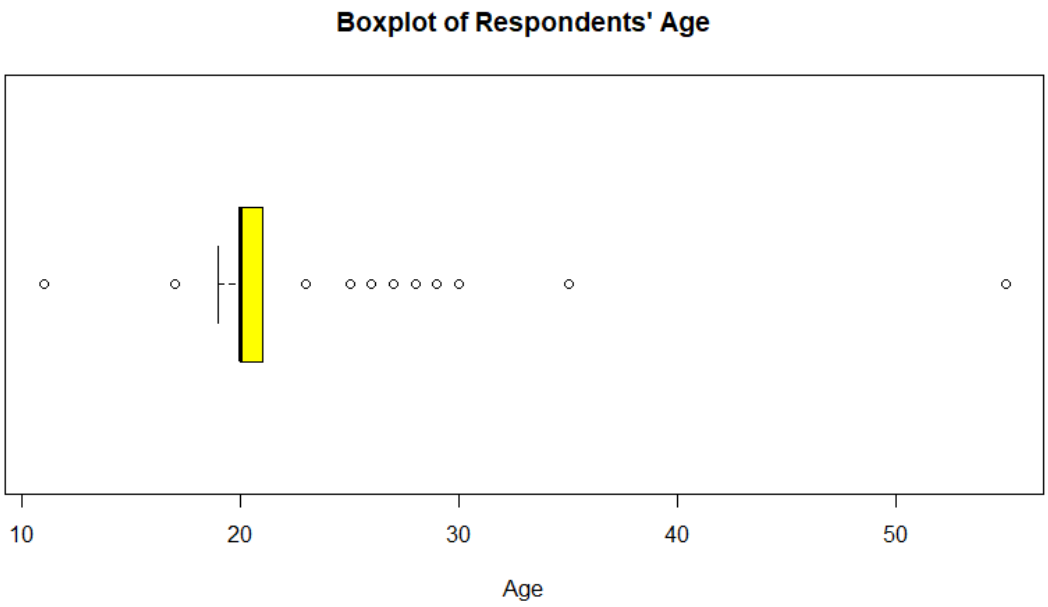


Figure 3: Boxplot of Respondents' Age

The boxplot above shows the age of respondents. From the boxplot, we know that the first quartile and median are the same with the age of 20 while the third quartile is age 21. The youngest respondent is 11 years old, while the largest age of respondents is age 55. The data distribution is positively skewed. Hence, most of our respondents are around 20 years old, with a frequency of 62.

Question 3

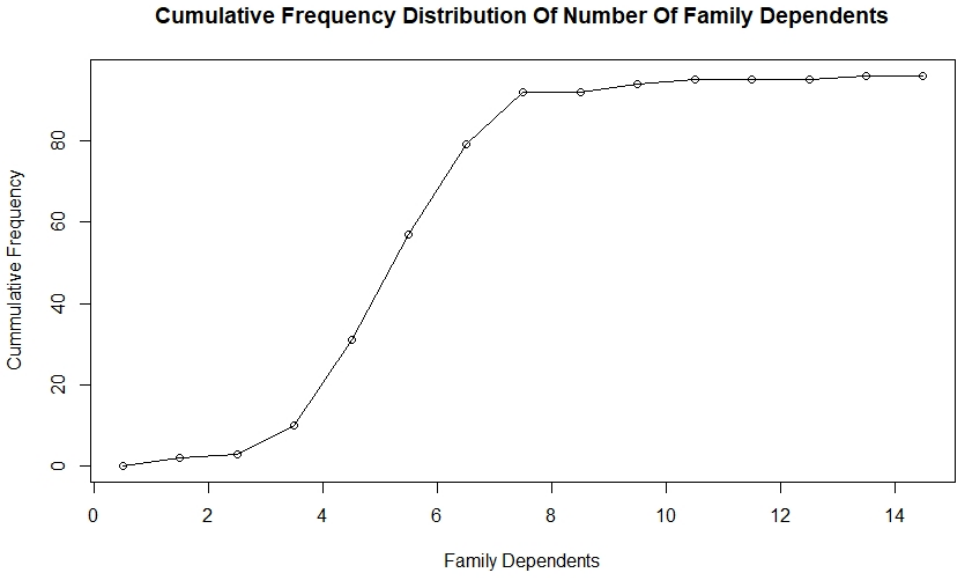


Figure 4: Ogive of Number of Family Dependents

The cumulative frequency of ogive above shows the number of Family Dependents in the family. The steeper the slope, the higher the frequency of the number of family dependents in the family. Therefore, it is very clear that the some of the family (2 respondents) have within 1 number of family dependents. This is followed by (29 respondents) have 2 to 4 number of family dependents. Other than that, 61 respondents have 5 to 7 number of family dependents also 3 respondents have up to 9 – 10 number of family dependents. However only one respondent have 13 number of family dependents.

Table 5: Question 3 Frequency Distribution Table

Class Interval	Midpoint, X	Frequency, f	fX	Cumulative Frequency
1 – 3	2	10	20	10
4 – 6	5	69	345	79
7 – 9	8	15	120	94
10 – 12	11	1	11	95
13 – 15	14	1	14	96
Total		***96***	***510***	

$mean, \bar{X} = \frac{510}{96} = 5.31 \sim 6$ family of dependents

$median = 3.5 + \frac{\left(\frac{96}{2}\right) - 10}{69}(3) = 5.15 \sim 6$ family of dependents

$$mode = 3.5 + 3 \times \frac{(69-10)}{(2(69)-10-15)} = 5.1 \sim 6 \text{ family of dependents}$$

From the central of measurement, the data have skewness = 0; it seems the mode, median, mean (mean=mode=median) are fall in the same point. So we can say this is symmetric distribution. The average number of family dependents is 6 people, and most of the family have 6 family dependents.

Question 4

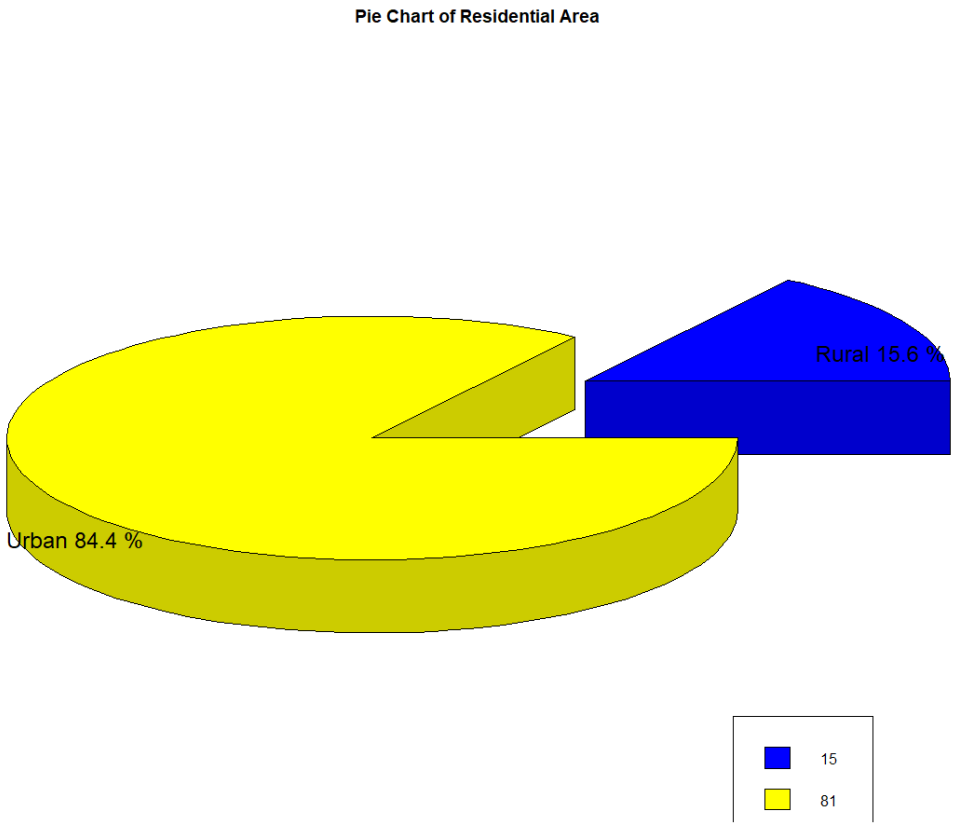


Figure 5: Pie 3D Chart Of Residential Area

Based on Figure 5, it was shown that the respondent mostly lives in the Urban area. The rural area is for those who stay out of town. The respondent taken is from Semenanjung Malaysia. The choice of living in the residential area is urban or rural, so they choose their residential area. From, this we can analyze most of the respondent comes from Urban area. However, from 96 respondents, 15 out of 96 respondents live in rural areas, while 81 out of 96 respondents live in urban areas. As analyzed, we conclude that 15.6% of respondents live in rural areas, and 84.4% live in urban areas. Therefore, for those respondents living in urban areas, they get more specialties like food delivery services that include shop varieties.

Question 5

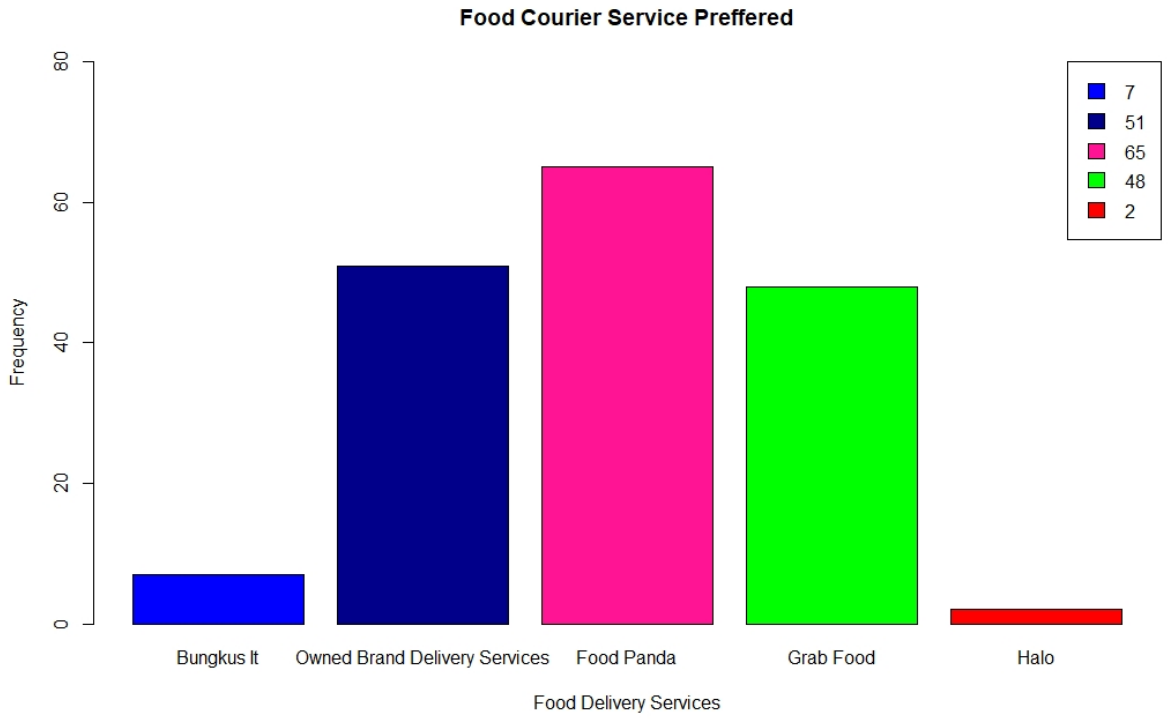


Figure 6: Bar Chart of Food Courier Service Preferred

The bar chart shows the five types of food delivery courier services used by the respondents. Food Panda records the highest amount of usage among the respondents, which are 65 respondents, followed by Grab Food (48 respondents), Owned Brand Delivery Services (51 respondents), Halo (2 respondents), and lastly, Bungkus It (7 respondents). The Halo and Bungkus It are the least used by the respondents with only the record with 2 for Halo and 7 for Bungkus It. This bar chart shows the food courier services preferred by the respondents. Among all those food courier services available and introduced to the respondents, only the Food Panda is the most popular.

Question 6

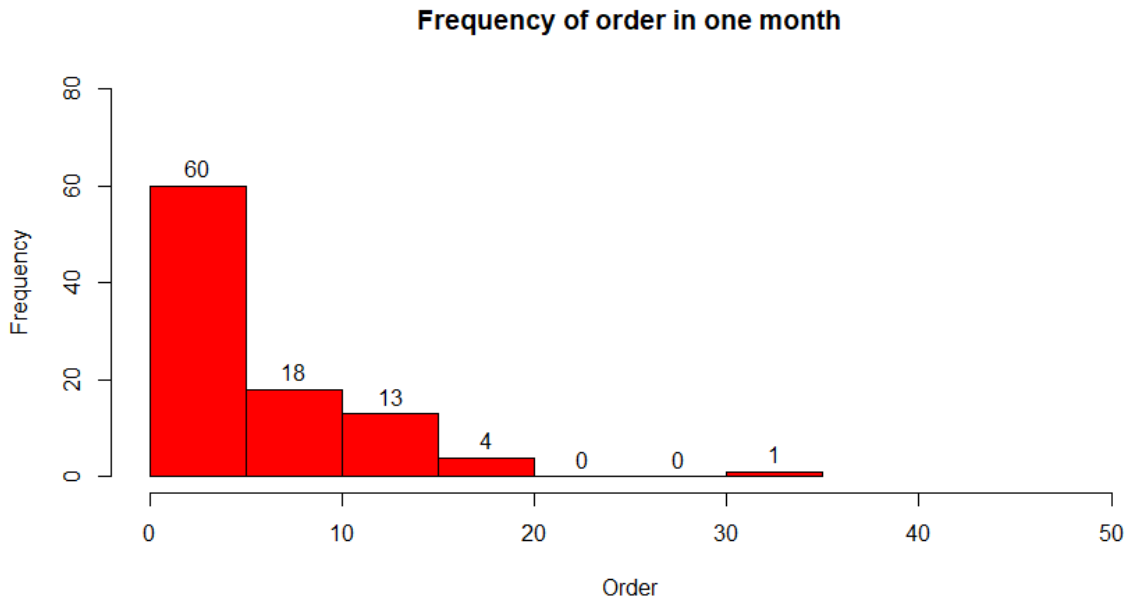


Figure 7: Histogram of Frequency of Order in One Month

Table 6 : Question 6 Frequency Distribution Table

Class Interval	Midpoint, X	Frequency, f	fX	Cumulative Frequency
0 – 5	3	60	180	60
5 – 10	7	18	126	78
10 – 15	13	13	169	91
15 – 20	17	4	68	95
20 – 25	23	0	0	95
25 – 30	27	0	0	95
30 - 35	33	1	33	96
Total		96	576	

Based on histogram of frequency of order in one month, we can get calculate measurement of central tendency:

$$mean, \bar{X} = \frac{576}{96} = 6.03125 : 6 \text{ order}$$

$$median = 0 + \frac{\left(\frac{96}{2}\right) - 0}{60}(5) = 4$$

$$mode = 0 + 5 \times \frac{(60-0)}{(2(60)-0-18)} = 2.94 : 2 \text{ order}$$

From the measurement of central, the average of order in one month is 6 order, but most of 96 respondents order is 2. Since the distribution is asymmetrical and mode < median < mean. This distribution is positively skewed where almost everyone ordered about 1 to 5 times a month.

Question 7

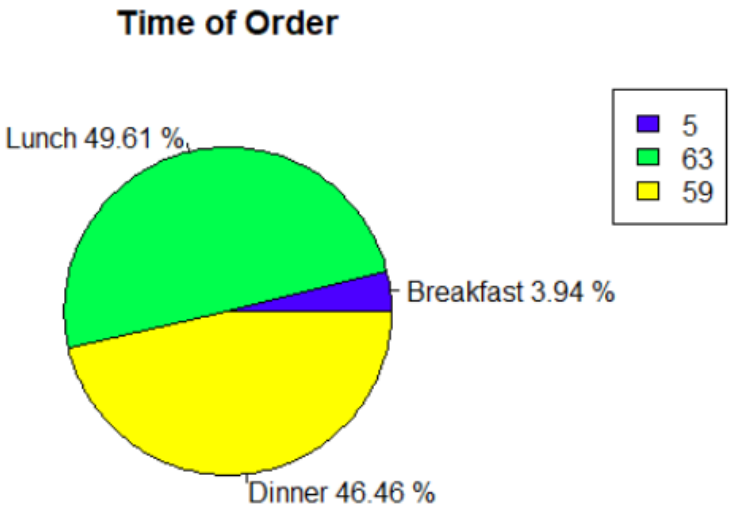


Figure 8: Pie Chart of Time of Order

Since the time of order is the multiple-choice answer, breakfast, lunch, and dinner represent 96 respondents for each. Lunch time records the highest frequency which 63 respondents and it is 49.61% from the total of three answers, followed by dinner time (59 respondents) and breakfast time (5 respondents). Among of all respondents are preferred to deliver order on lunch time and dinner time.

Question 8

Figure 9: Histogram of Price for One Order

Table 7:Question 8 frequency Distribution Table

Class Interval	Midpoint, X	Frequency, f	fX	Cumulative frequency
0 – 20	10	21	210	21
20 – 40	30	39	1170	60
40 – 60	50	20	1000	80
60 – 80	70	10	700	90
80 – 100	90	6	540	96
Total		96	3620	

Based on the histogram of price for one order, we can get calculate the measurement of central tendency:

$$mean, \bar{X} = \frac{3620}{96} = 37.71$$

$$median = 20 + \frac{(\frac{96}{2})-21}{39}(20) = 33.85$$

$$mode = 20 + 20 \times \frac{(39-21)}{(2(39)-21-20} = 29.73$$

From the measurement of central, the average price for one order is RM 37.71, but most of 96 respondents spend up to RM 29.73. Since the distribution is asymmetrical and mode < median < mean. This distribution is positively skewed where almost everyone spends less in a single order.

Question 9

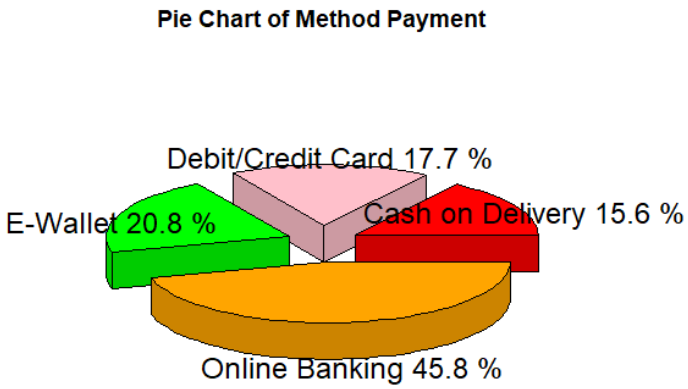


Figure 10: Pie Chart of Method Payment

Based on Figure 10, we can see that the respondent made their payment in various ways, such as using E-wallet, Debit/Credit Card, Cash on Delivery, and Online Banking. This payment pie chart method can be analyzed as to which method would be the most user-friendly for the users to use when making payment. Many users choose to use online banking as their payment method, with 45.8% of them using it to pay the order. We can conclude that Online Banking is the most convenient, and the user feels very secure when they use Online Banking as it has the security authentication that makes users feel safe using it. Next is the lowest method used by the user, which is Cash on Delivery. When The user Cash on delivery methods usually got no promotions and discounts and could increase the price.

Question 10

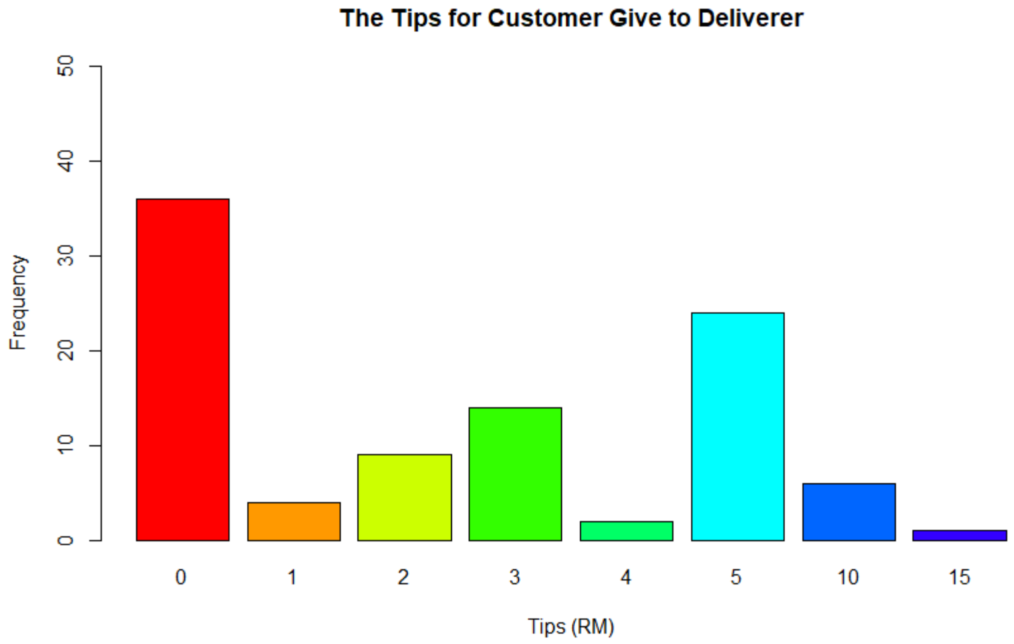


Figure 11: Bar Chart of Tips

The Tips for Customers Give to Deliverer

Stem	Leaf
0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	1 1 1 1 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 4 4 5 5 5 5 5 5 5
	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
1	0 0 0 0 0 0 5

Figure 12: Stem and Leaf Plot of Tips

The stem-and-leaf plot in figure 12 shows the number of tips the deliverer got from customers. The key is 1|0, where stem represents tens and 0 represents ones. For instance, 0|0 means RM0, 0|1 means RM1, 0|2 means RM2, 0|3 means RM3, 0|4 means RM4, 0|5 means RM5 and 1|0 means RM10 and 1|5 means RM15.

From both figures above, we can see that most of the 36 respondents did not give any tips to the deliverer, and the highest tips are RM15 which is only one respondent. Mostly the respondent gives RM5 tips to the deliverer. This is because RM5 is one-piece money that easy to donate.

Question 11

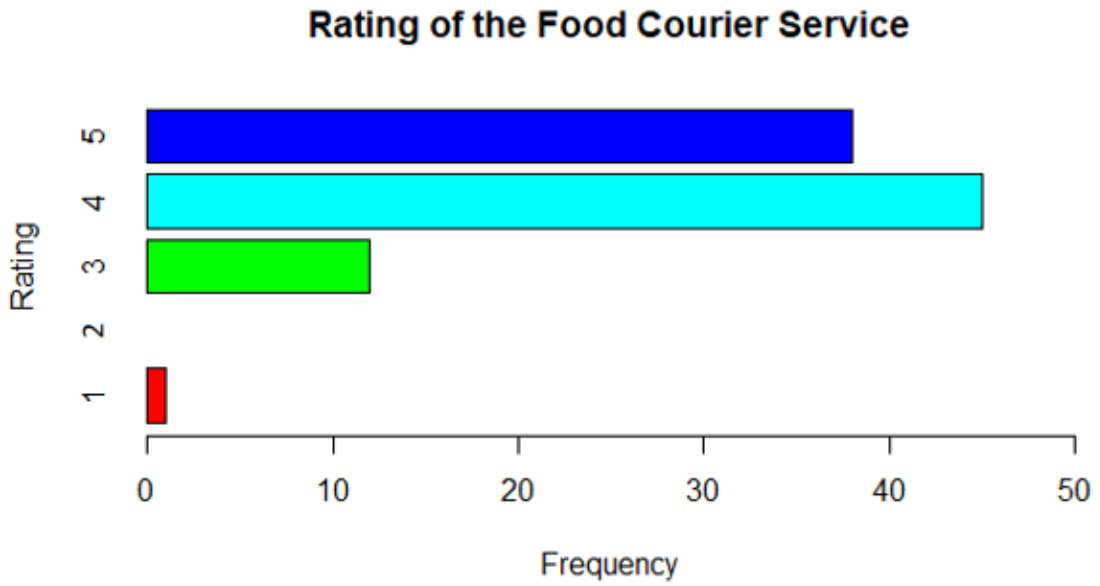


Figure 13: Horizontal Bar Chart of Rating of the Service

Based on figure 13, the Horizontal bar chart shows the customers' food courier serving ice based on how fast delivery, how good the condition of the Food, and how well treat by the deliverer to the customer. The rating is in Likert scale where if the customer choose 1 it is means the service is very unsatisfied, otherwise, if the customer choose 5 it is means the service is very satisfied. Thus, we can see that most of the customer rate the service by 4 (satisfied), which are 45 of 96 respondents. Besides that, no respondent rate the service by 2 (unsatisfied). Unfortunately, there is one customer who rates by 1 (very unsatisfied). In addition, there are 38 from 96 respondents' rate by 5 (very satisfied).

Question 12

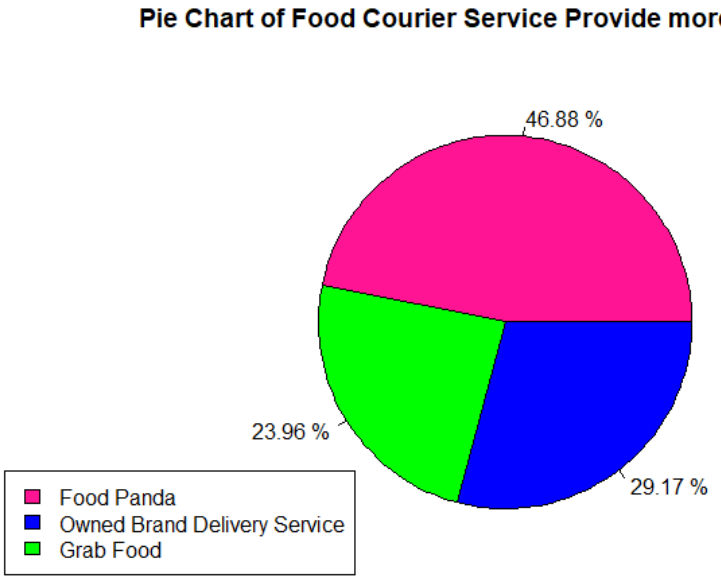


Figure 14: Pie Chart of Which Food Courier Service Provide Promotion

Based on figure 14, the pie chart shows which of the food courier service offer more promotion, for example, a discount for one order. We can see that 46.88% of the respondents, 45 persons, chose Food Panda as it provides more promotion than the other food courier services while the second most picked is Owned Brand Delivery Service, which has been chosen by 29.17% of the respondents (28 persons). Lastly, 23 of 96 respondents (23.96%) had chosen Grab Food to provide more promotion. Thus, from our data, we can assume that the more promotion deals that the food courier service offer, the more people will prefer to that particular food courier service because Food Panda is the highest picked as food courier service that provide more promotion and Food Panda also is the most preffered food courier service.

Question 13

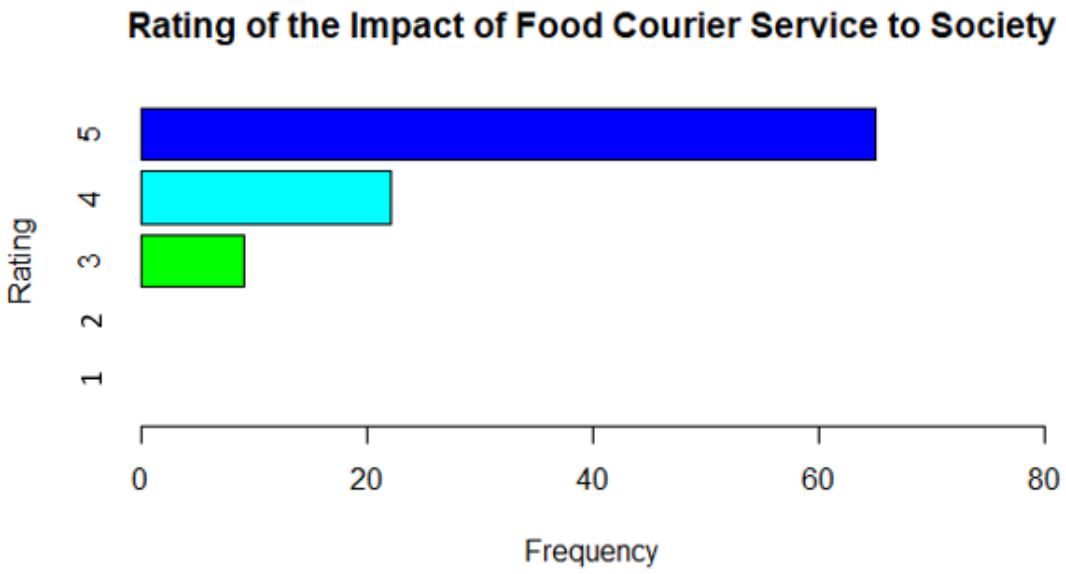


Figure 15: Horizontal Bar Chart of Rating of The Impact of Food Courier Service to Society

The horizontal bar chart above shows how the impact rate of the food courier services affects to the society. For the rate of the impact of the service to the society, scale 1 represents very bad impact, 2 represents bad impact, 3 represents neutral, 4 represents good impact while scale 5 represents very good impact.

The data shows that most of the respondents rate the impact of the food courier service as good impact (scale 4-5) to the. Besides, the chart shows that there are no one who vote bad impact (scale 1-2) to the society. Therefore, we can state that food courier service give a good impact to the society due to pandemic era, food courier service is desperately needed by the customers to avoid them from getting out from their house.

Conclusion

In this project, we have analyzed some techniques from subject Probability and Statistic Data Analysis. All the data measured are to implement four levels of data measurement: nominal, ordinal, interval, and ratio data. Therefore, we have analyzed, concluded, and presented the data in the form of graphic presentation such as ogive, bar chart, pie chart, box plots, and histograms using R Studio and Microsoft Excel to have a clear measurement and good data delivered as Data Analysis. The project aims to study the usage of the Food Delivery Courier Services among the UTM Students and people in Semenanjung Malaysia. From the analysis of data obtained in the survey, we have noticed that during the pandemic of Covid-19 food courier services are useful and new to people.

The rate of using Food Delivery Services is increasing than a self-pickup or dine-in shop, as many people claim they want to stay at home to prevent all this pandemic virus from spreading. From the data measure, we can see how much they spent per order based on the number of family dependents. We can say the more number of family dependents, the more the price per order. It was stated on the analysis that people living in an urban area frequently order food delivery services because in urban areas, they have many shops available.

Still, the most frequent order time is for lunch. For breakfast and lunch, the people tend to eat at home, and they preferred lunch time to get their Food. However, we measured that their family tends to order atmost 10 order in a month so we can see the average of the number of orders. According to the data analysis, the promotion in food courier really gives good impact to the customers which among the respondents. Most respondents love Food Panda as Food Panda gives more luck and happiness to the customers.

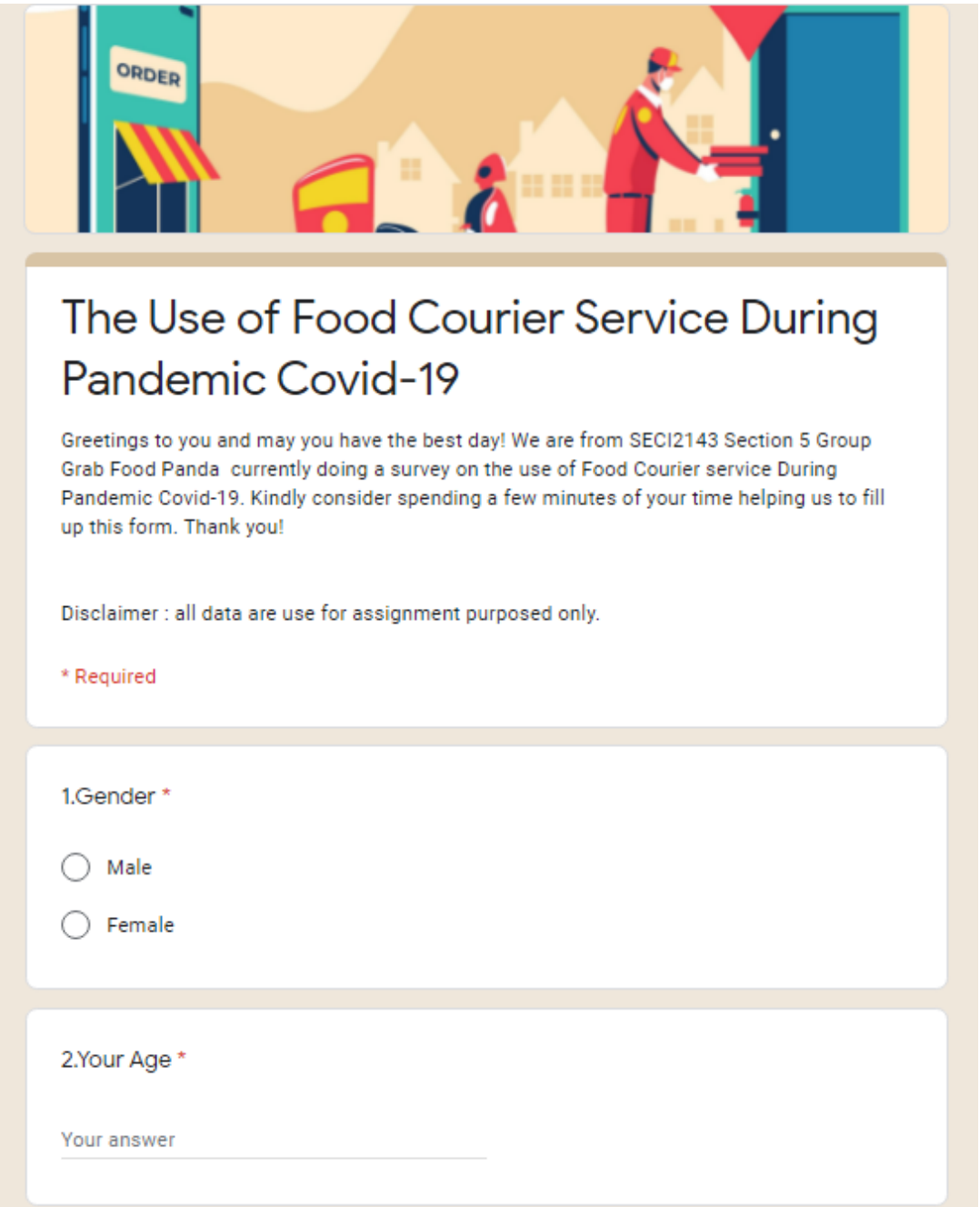
Moreover, we can see from the data analysis that the customers feel that the food courier services positively impact society. Hence, their services make them easy to deal with the food courier services system if due to some problems. To achieve the aim to generalize the usage of Food Delivery Courier Services among the UTM Students and outsiders. All of them show their cooperation by filling the form that we spread on social media. This way, we can boost more specialties in the food courier services to get more customers to order food delivery with the food courier services.

Appendix

Link of Survey :

https://forms.gle/1JvdwGW8765NHuUr5

Picture of Survey Form:



3.Your Family Dependent *

How many members in your family (including you)

Your answer

4.Type of your residential area ? *

Urban (Bandar) /Rural (Pedalaman)

- ◯ Urban
- ◯ Rural

5.Which Food Courier Service do you prefer? *

(multiple choice)

- ☐ Grab Food
- ☐ Food Panda
- ☐ Bungkus It
- ☐ Owned Brand Delivery Service
- ☐ Other:

6. In one month, what is the estimated frequency of you order the food? (delivery only) *

Your answer

7. Which meal and time do you usually order? *

(multiple choice)

- [ ] Breakfast (6:00 a.m to 11 a.m)
- [ ] Lunch (11 a.m to 4 p.m
- [ ] Dinner (4 p.m to 12 a.m)

8. What is the estimated price for one order? (in RM) *

Your answer

9. Payment Method *

- ◯ Cash on Delivery
- ◯ E-Wallet
- ◯ Online Banking
- ◯ Debit/Credit Card

10. How much do you give tips to the deliverer? *

Your answer

11.How do you rate the food courier service ? *

	1	2	3	4	5	
Very Unsatisfied	◯	◯	◯	◯	◯	Very Satisfied

12.Which Service provide more promotion? *

Grab Food

Food Panda

BUNGKUSIT

McDelivery

Domino's Pizza

KFC

Pizza Hut

- ◯ Grab Food
- ◯ Food Panda
- ◯ Bungkus It
- ◯ Owned brand Delivery Service
- ◯ Other:

13. How do you rate the impact of the food courier service to the society? *

	1	2	3	4	5	
Bad Impact	◯	◯	◯	◯	◯	Good Impact