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Assignment 1

Question 1

(a) Qualitative vs Quantitative Data

Customer Data	Type	Justification
Customer Name	Qualitative	A text label used to identify individuals.
Age Group (Child, teen, etc..)	Qualitative	Categories that describes characteristics not numerical.
Favorite Pizza Topping	Qualitative	Descriptive categories such as Pineapple, veggie.
Rating of Service (1-5 Star)	Quantitative	Numerical rating representing satisfaction.
Number of slices ordered	Quantitative	A countable number representing quality.
Total Bill Amount (RM)	Quantitative	A measurable amount of money spent.
Time Spent Eating (minutes)	Quantitative	A measurable quality representing time.

(b) Discrete vs. Continuous Quantitative Data

Quantitative Data	Type	Justification
Rating of service (1-5 Star)	Discrete	Whole numbers only, no in between like 0.5.
Number of slices ordered	Discrete	Countable items; cannot have a fraction of a slice.
Total bill amount (RM)	Continuos	can include decimals; measurable.
Time spent Eating (minutes)	Continuos.	Measured over time; can include fraction.

(c) Level of measurement.

Customer Data	Level of measurement	Justification
Customer Name	Nominal	Names are identifiers without numeric meaning
Age Group (Child, teen, etc)	Ordinal	Ordered categories, but difference are not measurable
Favorite Pizza Topping	Nominal	No inheret order among toppings
Rating of service (1-5 Star)	Ordinal	Values are ranked, but difference are subjective.
Number of slices ordered	Ratio	Zero exists and ratios are meaningful.
Total Bill Amount (RM)	Ratio	True zero and measurable ratios.
Time spent Eating (minutes)	Ratio	Has true zero time can be compared with ratios.

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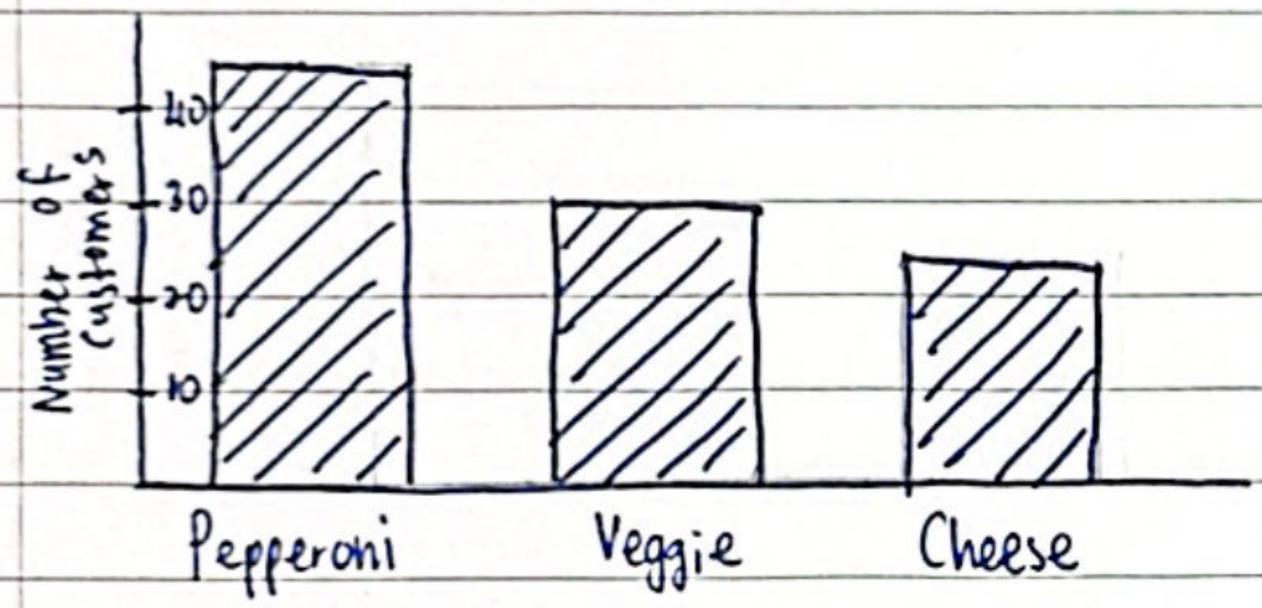
Question 2.

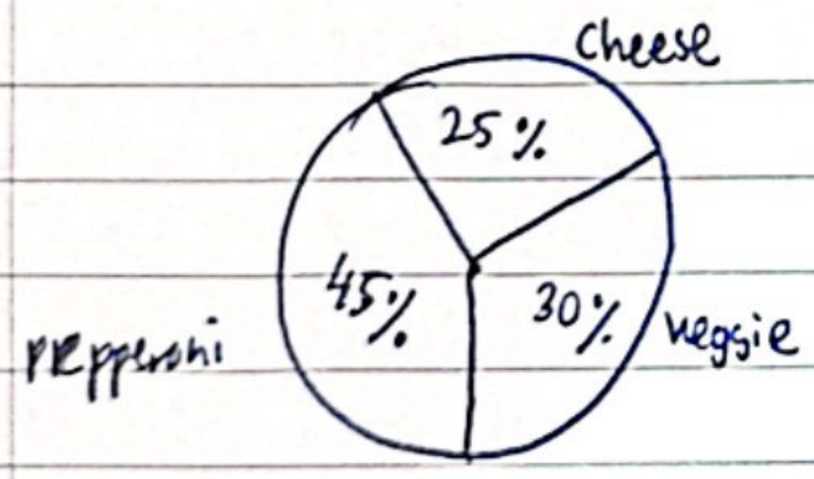
a. Construct a frequency table including relative frequencies (percentage)

Pizza Topping	Frequency	Relative Frequency (Percentage)
Pepperoni	45	$(45/100) \times 100\% = 45\%$
Veggie	30	$(30/100) \times 100\% = 30\%$
Cheese	100	$(25/100) \times 100\% = 25\%$
Total	100	100%

b. Bar chart and pie chart



Bar Chart of Favourite Pizza Toppings



Pie Chart of Favourite Pizza Toppings

c. A pie chart would be less effetive with eight (8) topping option because it might be a bit hard to accurately compare the relative sizes of ~~the~~ small slices, especially if some percentage are very close.

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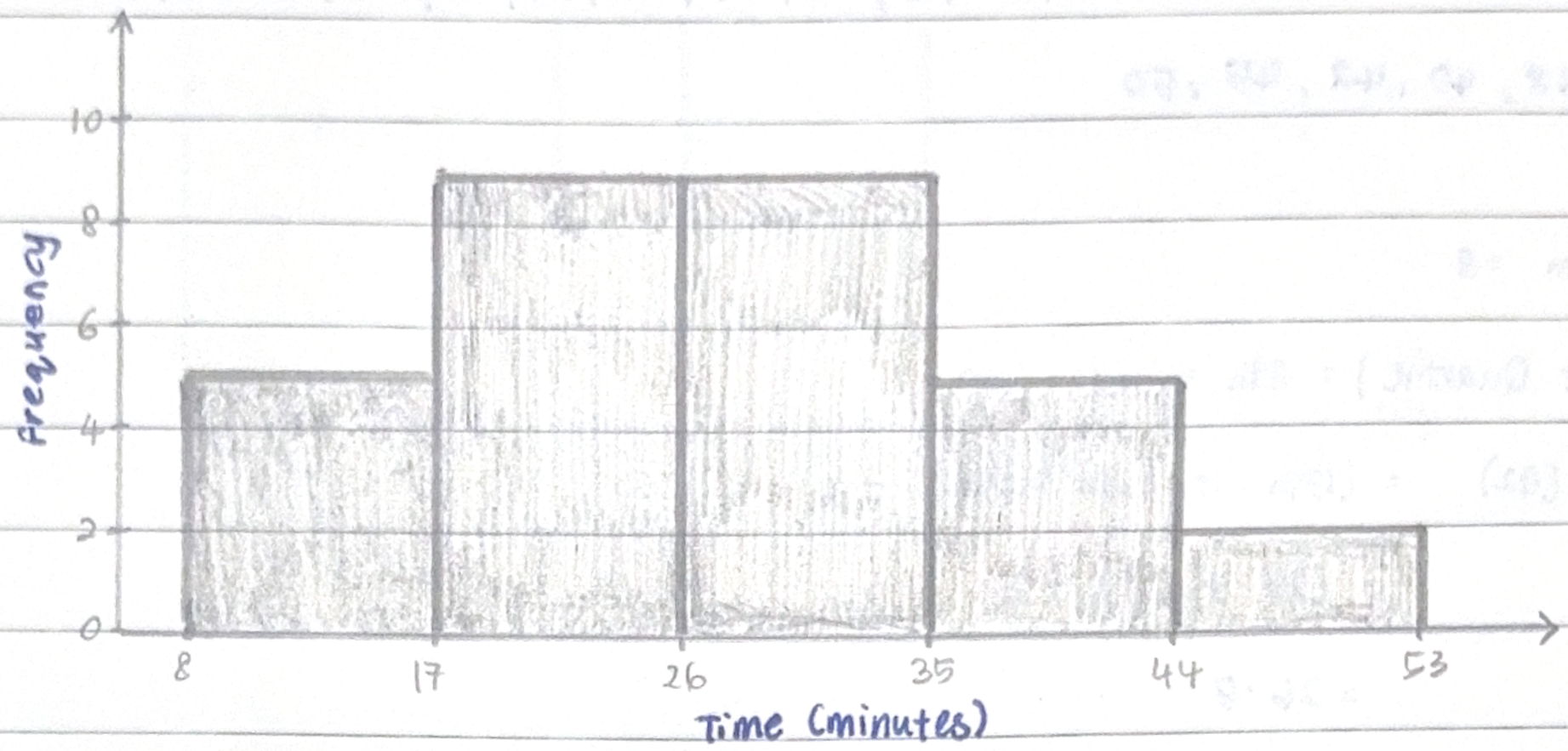
Questions 3

a. Histogram



Range :

minimum = 8

maximum = 50

Range = 50 - 8 = 42

Bin width = 42 ÷ 5 = 8.4 ≈ 9

Bins :

1. 8 – 16
2. 17 – 25
3. 26 – 34
4. 35 – 43
5. 44 – 52

Frequencies:

1. 8 – 16 : 8, 10, 12, 15, 16 → 5
2. 17 – 25 : 18, 19, 20, 21, 21, 22, 23, 24, 25 → 9
3. 26 – 34 : 26, 27, 28, 29, 30, 31, 32, 33, 34 → 9
4. 35 – 43 : 35, 36, 38, 40, 42 → 5
5. 44 – 52 : 45, 50 → 2

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b) calculate the minimum, first quartile (Q1), median, third quartile (Q3), and maximum based on the recorded time.

8, 10, 12, 15, 16, 18, 19, 20, 21, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 38, 40, 42, 45, 50

minimum = 8

Q1 (First Quartile) = 8th value = 20

median (Q2) = (15th + 16th value) ÷ 2

= (26 + 27) ÷ 2

= 26.5

Q3 (Third Quartile) = 23rd value = 34

maximum = 50

c) Interquartile Range (IQR)

IQR = Q3 − Q1

= 34 − 20

= 14

d) Any outliers using the 1.5x IQR Rule.

- Lower bound = Q1 − 1.5 x IQR

= 20 − 21

= −1

- upper bound = Q3 + 1.5 x IQR

= 34 + 21

= 55

No values are below −1 ~~and~~ or above 55.

No outliers.

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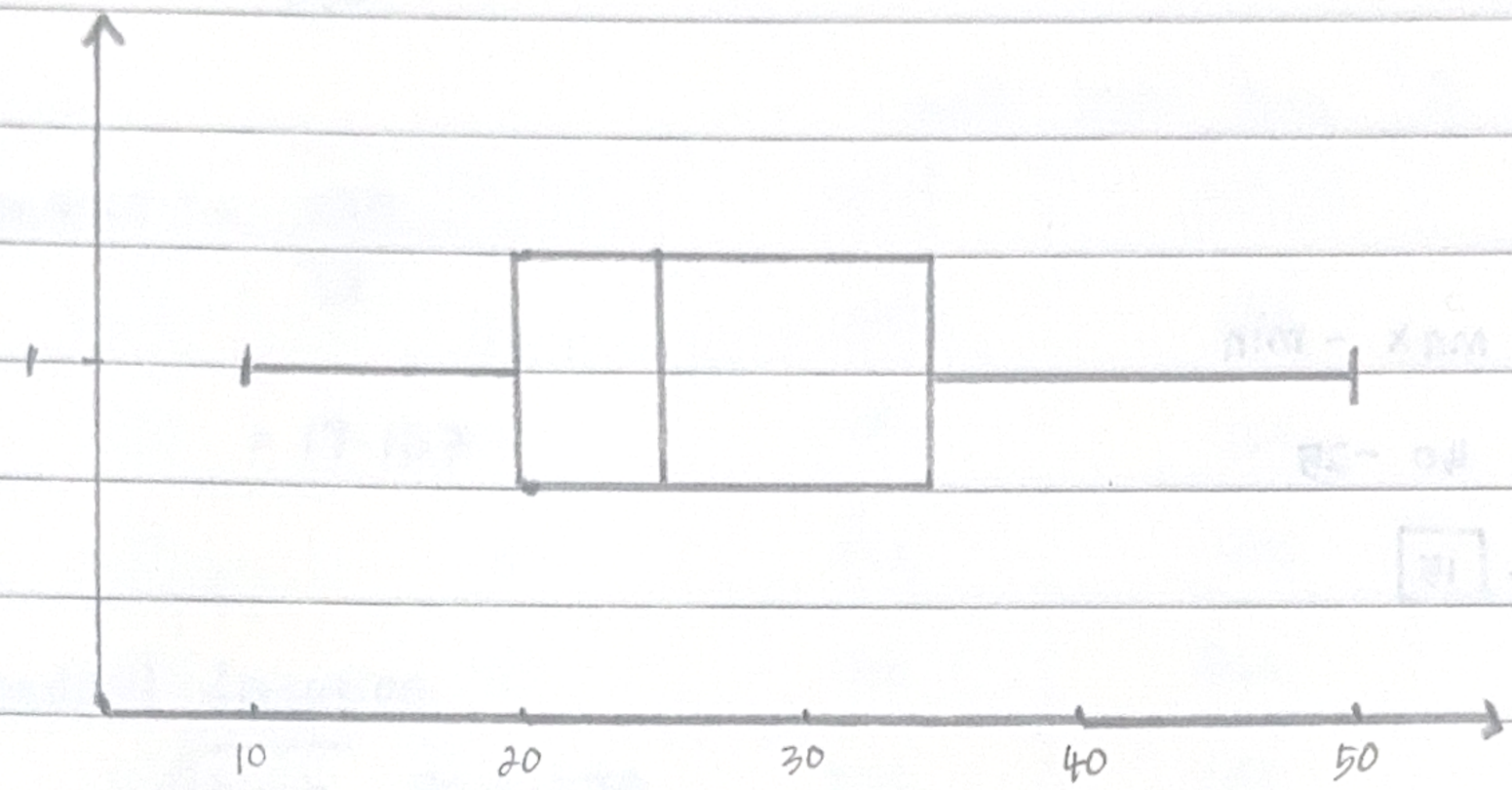
e) Modified ~~plot~~ Box Plot