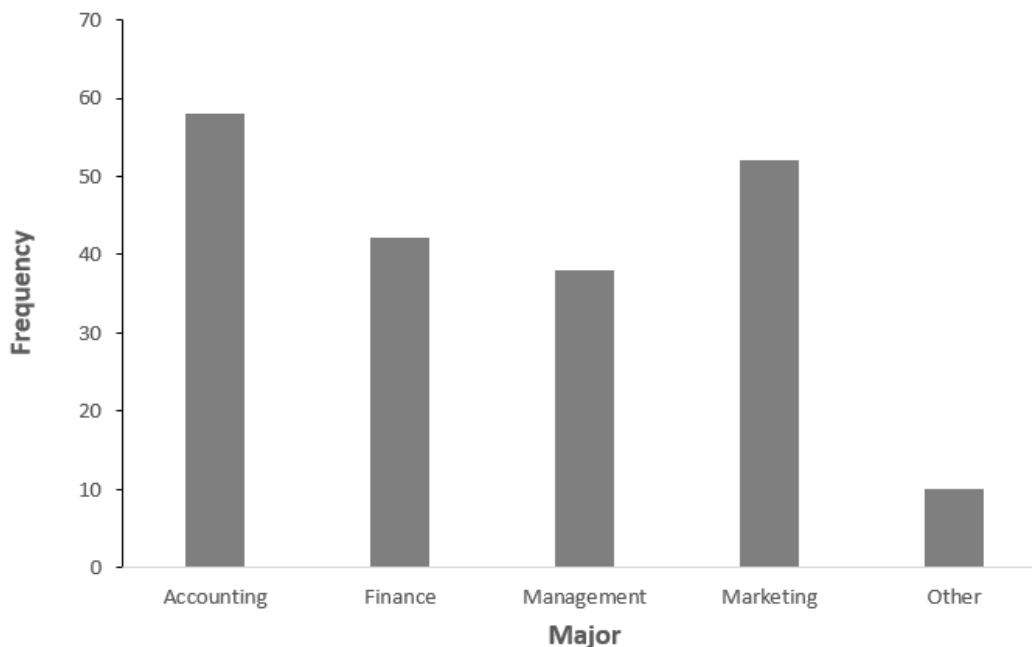## Question 1

All three parts are independent.

Part 1:

If you were only given the frequency bar chart below, would you be able to accurately reconstruct the original observations in the dataset for each major? Briefly explain. A simple Yes or No answer will not be sufficient, you must explain your answer!


Part 2:

Before leaving a particular restaurant, customers are asked to respond to the questions listed below. For each question, determine whether the possible responses are interval, nominal, or ordinal.

a.   What is the approximate distance (in miles) between this restaurant and your residence?
b.   Have you ever eaten at this restaurant before?
c.   What is your overall rating of the restaurant: excellent, good, fair, or fair?
d.   Which of the following attributes of this restaurant do you find most attractive: service, prices, quality of the food, or the menu?

Part 3:

Each of the following two histograms represents the distribution of acceptance rates (percent accepted) among twenty-five business Schools in 1995. These two histograms use different class intervals but are based on the same data. In each class interval, the left endpoint is included for specific intervals.
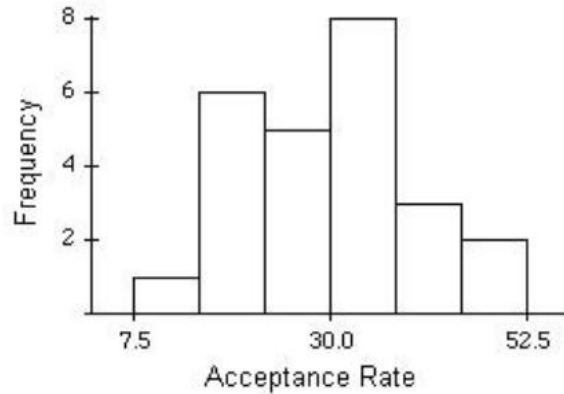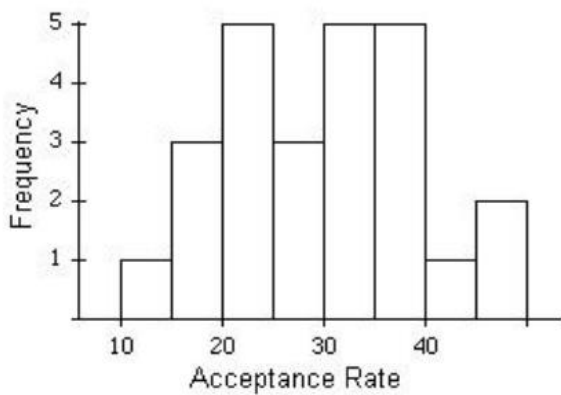
a.   What percent of the schools have an acceptance rate of less than 20% ?
b.   Which interval of acceptance rates contains fewer than half of all the observations?

(20%,35%) (22.5%,37.5%)   (30%,45%) (25%,40%)

Question 2

The following two sample data sets that are based on 8-day weather recorded in October of 2021 for two cities in Ontario.

Toronto temperature (in Celsius)	London temperature (in Celsius)
12	15
7	18
-3	8
10	4
9	1
-1	9
16	6
4	11

Answer the following questions and show your work to support your answers to get full marks.

a.   What is the mean and median temperature in Toronto? Which measure of central location best describes the typical temperature in Toronto and why?
b.   What is the MAD of the temperature in London?
c.   What is the interquartile range of the temperature in London?
d.   Which city has relatively more variation in temperature? The standard deviation of London temperature is 5.6061.

Question 3

Harborfront House Restaurant (HHR) conducted a survey to find out the busiest mealtime and day for customers. Research participants were asked (i) whether they ate at HHR on a weekday or on a weekend (ii) whether they like to eat at HHR during lunch time or dinner time. The survey reported that:

- 39% of participants ate at lunch time.
- 27% of participants ate at HHR on a weekend.
- 59.5% of participants ate at HHR during dinner time and on a weekday.

What is the probability that a randomly selected participant ate at HHR during lunch time or ate at HHR on a weekend?

a.   Are "weekend" and "dinner time" mutually exclusive events? Explain mathematically.
b.   What is the probability that a randomly selected participant ate at HHR on a weekday knowing that the participant ate at HHR during lunch time.
c.   What is the probability that a randomly selected participant ate at HHR during lunch time and ate at HHR on a weekday?
d.   Are "weekday" and "lunch time" independent events? Explain mathematically.