**Minitab Project (10 marks)**

**Due Sunday, July 11 before 11 AM**

**Instructions**

1. **Do all work with the Minitab program. Copy and paste all of your work from the Minitab worksheet. Please number all of your answers.** Explain in **YOUR OWN WORDS**.
2. **Be neat and organized!!**
3. **Submit your project on Moodle in one file (pdf or word), image file will not be accepted no later than Sunday July 11 before 11 AM. Late submission will not accepted.**

**Anyone who is caught copying someone else’s work will have**

**a zero F and so will the person you copied from.**

Every semester I teach this class, there are a few people who get

a zero F because of this. Do not let this be you!

**Question 1**

**Assessing Normality**

Many times, in statistics it is necessary to see if a set of data values is approximately normally distributed. There are special techniques that can be used. One technique is to draw a histogram for the data and see if it is approximately bell-shaped. (Note: It doesn’t have to be exactly symmetric to be bell-shaped.)

The number of branches of the 50 top libraries are shown

67 84 80 77 97 59 62 37 33 42

36 54 18 12 19 33 49 24 25 22

24 29 9 21 21 24 31 17 15 21

13 19 19 22 22 30 41 22 18 20

26 33 14 14 16 22 26 10 16 24

1. Construct a histogram for the data. (use 10 classes). **Make sure to label the graph to include your name and your id number.**
2. Describe the shape of the distribution
3. Based on your answer to question 2, do you feel that the distribution is approximately normal?

In addition to the histogram, distribution that are approximately normal have a bout 68% of the values fall within 1 standard deviation of the mean, about 95% of the data values fall within 2 standard deviations of the mean, and almost 99.7% of the data values fall within 3 standard deviations of the mean.

1. Find the mean and standard deviation for the data.
2. What percent of the data values fall within 1 standard deviation of the mean.
3. What percent of the data values fall within 2 standard deviations of the mean
4. What percent of the values fall within 3 standard deviations of the mean
5. How do your answers to questions 5, 6, and 7 compare to 68, 95, and 99.7, respectively?
6. Does your answer help support the conclusion you reached in question 3? Explain.

**Question 2**

**Dropping College Courses**

Use the following table to answer the questions.

|  |  |  |
| --- | --- | --- |
| Reason for dropping a college course | Frequency | Percentage |
| Too difficult | 45 |  |
| Illness | 40 |  |
| Change in work schedule | 20 |  |
| Change of major | 14 |  |
| Family-related problems | 9 |  |
| Money | 7 |  |
| Miscellaneous | 6 |  |
| No meaningful reason | 3 |  |

1. What is the variable under study? Is it a random variable?
2. How many people were in the study?
3. Complete the table. Make sure to paste the Minitab printout.
4. From the information given, what is the probability that a student will drop a class because of illness? \_\_\_\_\_\_\_\_\_\_\_\_\_ money? \_\_\_\_\_\_\_\_\_\_\_ Change of major?\_\_\_\_\_\_\_
5. Would you consider the information in the table to be a probability distribution? Justify your answer.
6. Are the categories mutually exclusive?
7. Are the categories independent?
8. Are the two requirements for a discrete probability distribution met? Explain.

**Question 3**

**Blood Alcohol Concentrations**

A study was conducted to investigate a relationship between age (in years) and BAC

(Blood Alcohol Concentration) measured when convicted DWI (Driving While Intoxicated) jail inmates were first arrested. Sample data are given below for randomly selected subjects. Based on the result, **does the BAC level seem to be related to the age of the person tested? Analyze your results.**

Age 17.2 43.5 30.7 53.1 37.2 21.0 27.6 46.3

BAC 0.19 0.20 0.26 0.16 0.24 0.20 0.18 0.23

What is the best predicted blood alcohol level of a person 21.0 years of age who has been convicted and jailed for DWI? (The BAC level is measured when the person is first arrested.)