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FEEDBACK TUTORIAL LETTER

ASSIGNMENT 1

SEMESTER 1 - 2018

BASIC BUSINESS STATISTICS 1A

[BBS111S]



Course Name: BASIC BUSINESS STATISTICS 1A
Course Code: BBS111S
Department: MATHEMATICS AND STATISTICS
Course Duration: ONE SEMESTER
NQF Level and Credit: NQF Level and Credit: LEVEL 6; 12 CREDITS

Your marker-tutor for BASIC BUSINESS STATISTICS 1A

The Namibia University of Science and Technology has appointed **MR A. ROUX , MR C. MAPIRA,**

DR I. MAPOSA, & MR E. MWAHI as marker-tutors for **BASIC BUSINESS STATISTICS 1A**

They will be at your service, should you experience any problems with your studies or with the assignments. Contact details are as follows:

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ASSIGNMENT 1

Question 1 [20 marks]

- 1.1 D [1]
- 1.2 E [1]
- 1.3 C [3]
- 1.4 D [3]
- 1.5 C [3]
- 1.6 E [3]
- 1.7 C [3]
- 1.8 D [3]



QUESTION 2 [37 marks]

2.1. A The number of families who used the Windhoek YWCA day care service was recorded during a 30-day period. The results are as follows:

31	49	19	62	24	45	23	51	55	60
40	35	54	26	57	37	43	65	18	41
50	56	4	54	39	52	35	51	63	42

2.1.1. Construct an ordered stem-and-leaf plot for the data. [4]

Solution

Stem	Leaf
0	4
1	8 9
2	3 4 6
3	1 5 5 7 9
4	0 1 2 3 5 9
5	0 1 1 2 4 4 5 6 7
6	0 2 3 5

2.1.2. Calculate the following statistics for the number of families that used the day care service:

2.1.2.1 Mean. [2]

Solution

$$\bar{x} = \frac{1}{n} \sum x = \frac{1}{30}(1281) = 42.7$$

2.1.2.2 Median. [2]

Solution

$$\text{Median} = 44$$

2.1.2.3 Mode. [2]

Solution

$$\text{Mode} = 35, 51 \text{ and } 54$$

2.1.2.4 Standard deviation. [4]

Solution

$$s = \sqrt{\frac{\sum x^2 - \frac{(\sum x)^2}{n}}{n-1}} = \sqrt{\frac{61389 - \frac{1281^2}{30}}{29}} = \sqrt{230.7} = 15.1888$$

2.1.2.5 Coefficient of variation. [2]



Solution

$$CV = \frac{s}{\bar{x}} \times 100\% = \frac{15.1888}{42.7} \times 100\% = 35.6\%$$

2.1.2.6 Inter-quartile range.

[4]

Solution

$$Q_1 = 34$$

$$Q_3 = 54.25$$

$$IQR = Q_3 - Q_1$$

$$IQR = 54.25 - 34 = 20.25$$

2.1.3. Using your answers in 2.1.2., what can you conclude about the distribution of the data? Motivate your answer.

[2]

Solution

The distribution is left skewed

$$Median = 44 > 42.7 = Mean$$

2.1.4. Using the classes in your stem and leaf define class boundaries and use them to construct a frequency table with the following distributions: frequency distribution and cumulative (%) distribution.

[3]

Solution

Lower bound	Upper bound	Frequency	% Cumulative frequency
0	10	1	3.3
10	20	2	10
20	30	3	20
30	40	5	36.7
40	50	6	56.7
50	60	9	86.7
60	70	4	100

2.1.5. Only on graph paper, construct the less than ogive for the data.

[4]

Solution



2.1.6. Using the frequency distribution compute the following statistics:

2.1.6.1. Median.

[4]

Solution

Lower bound	Upper bound	Frequency	Cumulative frequency
0	10	1	1
10	20	2	3
20	30	3	6
30	40	5	11
40	50	6	17
50	60	9	26
60	70	4	30

$$\begin{aligned} \text{Median} &= L_m + \frac{c(0.5n - F_{m-1})}{f_m} \\ &= 40 + \frac{10(0.5(30) - 11)}{6} \\ &= 46.6667 \end{aligned}$$

2.1.6.2. Mode.

[4]

Solution



$$\begin{aligned} \text{Mode} &= L_m + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \checkmark \\ &= 50 + \frac{9 - 6}{2(9) - 6 - 4} \checkmark \\ &= 50.375 \checkmark \end{aligned}$$

QUESTION 3 [9 marks]

3.1. A study done on a sample of 1000 people to determine the dominant hand used by individuals produced the following data classified by gender.

	Men	Women
Left-handed	63	50
Right-handed	462	425

If a person is selected at random from this group, calculate the probability that the person:

3.1.1. Is left-handed. [2]

Solution

$$P(LH) = \frac{113}{1000} = 0.113 \checkmark \checkmark$$

3.1.2. Is either a man or is left-handed. [3]

Solution

$$\begin{aligned} P(M \cup LH) &= P(M) + P(LH) - P(M \cap LH) \checkmark \\ &= \frac{525}{1000} + \frac{113}{1000} - \frac{63}{1000} \checkmark \\ &= \frac{575}{1000} \\ &= 0.575 \checkmark \end{aligned}$$

3.1.3. If the person is a woman, she is left-handed. [4]

Solution

$$\begin{aligned} P(LH / W) &= \frac{P(LH \cap W)}{P(W)} \checkmark \\ &= \frac{50/1000}{475/1000} \checkmark \checkmark \\ &= 0.1053 \checkmark \end{aligned}$$

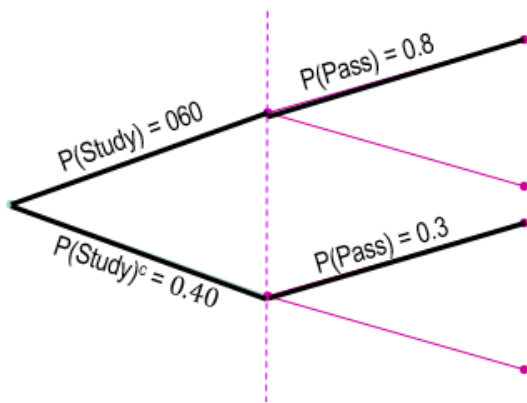


QUESTION 4 [6 marks]

4.1. The probability that a student passes Statistics is 0.8 if he/she studies for the exam and 0.3 if he/she does not study. If 60% of the class studied for the exams, and a student chosen at random from the class passes:

4.1.1. What is the probability that the student passed? [4]

Solution



$$\begin{aligned} P(\text{Pass}) &= P(\text{Study}) \cdot P(\text{Pass} / \text{Study}) + P(\text{Study})^c \cdot P(\text{Pass} / \text{Study}^c) \quad \checkmark \\ &= 0.6 \times 0.8 + 0.4 \times 0.3 \\ &= 0.48 + 0.12 \\ &= 0.6 \quad \checkmark \end{aligned}$$

4.1.2. What is the probability that the student studied? [2]

Solution

$$\begin{aligned} P(\text{Study} / \text{Pass}) &= \frac{P(\text{Study}) \cdot P(\text{Pass} / \text{Study})}{P(\text{Pass})} \\ &= \frac{0.6 \times 0.8}{0.6} \\ &= \frac{0.48}{0.6} \quad \checkmark \\ &= 0.8 \quad \checkmark \end{aligned}$$

TOTAL MARKS: 72