Victoria University
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Final Assessment

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Submitted To:

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Answer to the question no 1(a)

 # Compute the mean, median, and mode. Is the distribution symmetrical, positively skewed,or negatively skewed? Explain.

#1.a)

$$\therefore \text{mean} = \bar{x} = \frac{\Sigma x}{n} = \frac{74.26}{15}.$$

$$= 4.95$$

The median is the middle value in a set of above data. arrang from smallest to largest.

$\therefore$ Median = 3.18

standard deviation $s = \sqrt{\frac{\Sigma(x-\bar{x})^2}{n-1}}$

$$= \sqrt{\frac{(.09-4.95)^2 + \cdots\cdots + (16.40-4.95)^2}{15-1}}$$

$$= 5.22$$

persons coefficient of skewness

$$sk = \frac{3(\bar{x} - \text{median})}{s}$$

$$= \frac{3(4.95-3.18)}{5.22}$$

$$= 1.017$$

Moderate positive skewness.

skewness table value 1-2 is moderately positively skewed distribution. our skewness result is 1.017. thats why.

Answer to the question no 1(b)

 # Study time of 10 students (in hour) 3,4,2,4,6,2,5. Calculate the coefficient of kurtosis.

1.b)

study time of 7 students (in hours) 3,4,2,4,6,2,5.

calculate the coefficient of kurtosis.

∴ kurtosis is measured by

$$\beta_2 = \frac{\mu_4}{\mu_2^2}$$

where β_2 = coefficient of kurtosis

μ_4 = is the 4th moment

μ_2 = is the 2nd moment

$$\therefore \bar{x} = \frac{3+4+2+4+6+2+5}{7} = 3.71$$

$$\mu_2 = \frac{(3-3.71)^2+(4-3.71)^2+(2-3.71)^2+(4-3.71)^2+(6-3.71)^2+(2-3.71)^2+(5-3.71)^2}{7}$$

$$= 1.92$$

$$\mu_4 = \frac{(3-3.71)^4+(4-3.71)^4+(2-3.71)^4+(4-3.71)^4+(6-3.71)^4+(2-3.71)^4+(5-3.71)^4}{7}$$

$$= 6.80$$

$$\therefore \text{kurtosis } \beta_2 = \frac{\mu_4}{\mu_2^2} = \frac{6.80}{(1.92)^2} = \frac{6.80}{3.67} = 1.85$$

This value is platykurtic distribution Ans

Answer to the question no 3

A basketball player makes 82% of the free throws he tries. Assuming this percentage will hold for future attempts, find the probability that in the next five tries, the number of free throws he will make is

(i) exactly 5 (ii) at least 4 (iii) none (iv) Find the mean & variance

Answer to the question no 3

3. i) exactly 5

$\therefore p = 82\% = 0.82$

$q = .18$

$n = 5$

$P(x) = \binom{n}{x} p^x q^{n-x}$

$P(x=5) = \binom{5}{5} p^5 q^{5-5}$

$= 0.3707$

3) ii) $P(x \leq 4) = 1 - 5$ $(\because P(x=5) = .3707$

$= 1 - 0.37.07$

$= 0.6293$

3) iii) $P(x=0) = \binom{5}{0} \times (.82)^0 (.18)^0$

$= 0.0227.$

3(iv) mean $= np = 5 \times .82$

$= 4.1$

variance $= npq = 5 \times .82 \times .18$

$= 0.738$

Answer to the question no 4

An average of 5.8 customers come to the bank every half an hour. Using the Poisson formula, Find the probability that during a given hour, the number of customers who will come to the bank is

a) at most 3

b) 7 or more

Answer to the question no 4

4) Average of half hours = 5.8

Average of an hours = 5.8×2

$= 11.6$

$P(x) = \frac{e^{-\lambda} dx}{x!}$ $\quad \therefore \lambda = 11.6$

a) $P(x \leq 3) = P(0) + P(1) + P(2) + P(3)$

$= \frac{e^{-11.6} \times (11.6)^0}{0!} + \frac{e^{-11.6} \times (11.6)^1}{1!} + \frac{e^{-11.6} \times (11.6)^2}{2!} + \frac{e^{-11.6} \times}{3!}$

$= 0.00312$

b) $P(x \geq 7) = 1 - P(x < 7)$

$= 0.94291$

Answer to the question no 5

A very large group of students obtains test scores that are normally distributed with a mean of 48 and a standard deviation of 7. What proportion of students obtained scores

Answer to the question NO 5

Answer:-

Let X denote the test score. then

a) $P(x<55 = P\left(\frac{x-\mu}{\sigma} < \frac{55-\mu}{\sigma}\right)$

$= P\left(z \frac{55-48}{7}\right)$

$= P(z<1)$

$= P(-\infty<z<1)$

$= .84134$ (by using normal table)

That is 84.13 of the students obtained scores less than 55

b) $P(x>95) = P\left(\frac{x-\mu}{\sigma} > \frac{95-\mu}{\sigma}\right)$

$= P\left(z > \frac{95-48}{7}\right)$

$= P(z > 6.714)$

$= 1 - P(z<6.714)$

$= 1-1 = 0$ (by using normal table)

That is 0% of students obtained score more than 95.

c) $P(75<x<90) = P\left(\frac{75-\mu}{\sigma} < \frac{x-\mu}{\sigma} < \frac{90-\mu}{\sigma}\right)$

$= P\left(\frac{75-48}{7} < z < \frac{90-48}{7}\right)$

$= P(3.857 < z < 6)$

$= P(z<6) - P(z<3.854)$

$= 1 - 0.99994$ (by using normal table)

$= 0.00006$

That is 6% of the students obtained score in the range 75 to 90.