Fardouse Lomat Jahan Rumpa
ID: 2219170041
Department: CSE (E)
Batch: 17th
Course code: STA-235
Course name: Statistics

Statitics : STA : 235

Ans to the QUS NO : 01(b)

Fardouse Lomat Jahan
ID : 2210170041 (47th)
Department : CSE (E)

(1) (b) The given numbers : 3, 4, 2, 4, 6, 2, 5

we first calculate the valus of the mean and standard discribution .

$$\bar{x} \Rightarrow \frac{\sum x_i}{n} =$$

$$\Rightarrow \frac{3+4+2+4+6+2+5}{7} \quad [n=7]$$

$$\Rightarrow \frac{26}{7}$$

$$\Rightarrow 3.71$$

x_i	$x_i - \bar{x}$	$(x_i - \bar{x}_i)^2$	$(x_i - x)^3$	$(x_1 - \bar{x})^4$
	$x_1 = 3.71$	$(x_1 - 3.71)^2$	$(x_1 - 3.71)^3$	$(x_1 - 3.71)^4$
3	$(3-3.71) = 0.71$	0.50	0.35	0.25
4	$(4-3.71) = 0.29$	0.08	0.02	7.07×10^{-3}
2	$(2-3.71) = -1.71$	2.92	-5.00	8.55
4	$(4-3.71) = 0.29$	0.08	0.02	7.07×10^{-3}
6	$(6-3.71) = 2.29$	5.24	12.00	27.50
2	$2-3.71 = 0.29$	0.08	0.02	7.07×10^{-3}
5	$5-3.71 = 1.29$	1.66	2.14	2.76
	Total = 3.45	Total = 10.56	Total = 9.55	Total = 39.08

(2)

Standard deviation

$$= \sqrt{\frac{\Sigma(x_i - \bar{x})^2}{n}}$$

$$= \sqrt{\frac{10.56}{7}}$$

$$= 1.22$$

$$\text{Kurtosis} = \frac{\Sigma(x_i - \bar{x})^4}{n(\sigma)^4}$$

$$= \frac{(39.08)^4}{7 \times (1.22)^4}$$

$$= 2.52.$$

(Answer)

③ STA : 235 (Statitics) (4)

Ans to the Qus No: 01

(a)

mean $= \dfrac{0.09+0.13+0.41+0.51+1.12+1.20+1.49+3.18+3.50+6.36+7.83+}{15}$

$\dfrac{8.92+10.13+12.99+16.40}{}$

$$\bar{x} = \frac{\sum x}{n}$$

$$= \frac{74.26}{15}$$

$$= 4.95$$

median $= 3.18$

Mode: using empiricsm formula:

$3\times$ median $- 2\times$ mean

$\Rightarrow 3\times 3.18 - 2\times 4.95$

$\Rightarrow -0.36$

$$\therefore S = \sqrt{\frac{\sum(x-\bar{x})^2}{n-1}}$$

$$= \sqrt{\frac{(0.09-4.95)^2 + (16.40-4.95)^2}{15-1}}$$

$$= 5.22$$

(N)

$$\therefore Sk = \frac{3(\text{mean}-\text{median})}{s}$$

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

$$= 1.017$$

The value is 1.017 So the range would be (1-2) and therefore the skewed should be: Madercally positivly Skewed Distribution.

b

Ans to the Qus NO: 02

(a) Unhappy with the major $= \frac{129}{129+101}$

$= 0.56$

(b) The student happy with the communication:

$$\frac{33}{101} \Rightarrow 0.326$$

(c) $$\frac{43+33}{101}$$

$$= \frac{76}{101}$$

$$= 0.75$$

(d) $\frac{57+27}{129}$

$\Rightarrow 0.65$

(Ans)

Ans to the qus NO: 03

(a) $n=5$

x is the binomial variate with Probability $= \frac{82}{100}$

$= \frac{41}{50}$

$f(x; 5, \frac{1}{5}) = \binom{5}{x}\left(\frac{41}{50}\right)^{x}\left(\frac{41}{50}\right)^{5-x}$ for x = mean 5 times

(a)

$P[\text{exactly } 5] = P[x=5] = \binom{5}{5}\left(\frac{41}{50}\right)^{5}\left(\frac{41}{50}\right)^{5-5}$

$= \frac{5!}{5!\,(5-5)!} \times 0.3040$

$= 0.3040$

(b) $P[\text{at least 4 heads}] = P[x \geq 4] = P[x=4] + P[x=5]$

$= \binom{5}{4}\left(\frac{41}{50}\right)^{4}\left(\frac{41}{50}\right)^{5-4} + \binom{5}{5}\left(\frac{41}{50}\right)^{5}\left(\frac{41}{50}\right)^{5-5}$

$= 5 \times 0.3707 + 0.3707$

$= 2.2242$

(c) $P[\text{none}] = P[x=0] = \binom{5}{0}\left(\frac{11}{50}\right)^0 \left(\frac{11}{50}\right)^{5-0}$

$$\frac{5!}{0!\,(5-0)!} \times \left(\frac{11}{50}\right)^5$$

$= 0.3707$

(d) mean is the np

$\Rightarrow 5 \times \frac{11}{50}$

$\Rightarrow 1.1$

variance is $= npq$

$= 5 \times \frac{11}{50} \times \frac{9}{50}$ $[q = 1-p]$

$= 0.738$

Ans to the Qus NO: 05

(a) $P(x<5\mu) = P\left(\frac{x-\mu}{\sigma} < \frac{55-\mu}{\sigma}\right)$

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

$= P(z<1)$

$= 0.8413$ (Using normal table)

That is 84.13% of the student obtained scores.

(b) Ans:

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

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

$= P(z > 6.71)$

$= P(-\infty > z > 6.71)$

$P(75 < \mu\, 90) = P\, \frac{75-\mu}{\sigma} < \frac{x-\mu}{\sigma} < \frac{90-\mu}{\sigma}\Big)$

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

$= P(3.85 < z < 6)$

$= P(-\infty < z < 6) - P(-\infty < z < 3.85)$