Q.P. Code : 60199

SEMESTER I Computer Science Solution

1 - b 2 - c 3 - a 4 - c 5 - b

1 $\frac{1}{6}$ 2 Linear 3 34 and 7 4 4th Central Dispersion

Median = $l_1 + \frac{\left(\frac{N}{2} - Cf\right)}{f} \times l_2 - l_1$

(All quantities in usual notation)

Coefficient of determination is the square of Karl Pearsons correlation coefficient ie r^2

Incidence of common cold & ownership of television

Nonsense correlation is corrln supported by data but no real

$P(A) = \frac{\text{No. of favorable outcomes for A}}{\text{Total No. of Outcomes}} = \frac{m}{n}$

Attribute - is that characteristic which cannot be measured quantitatively.

Discrete variable - Represents discrete whole No. Value
Ex: No of children in family

Continuous variable - Takes all values over the real line : Ex. Rainfall of a place

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

Coefficient of variation = $\frac{S.D}{\text{mean}} \times 100$

Quantiles are partition values which divide the data into a number of parts. Ex. Quartiles Deciles Percentile

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i Scatter or spread of data is known as dispersion
Range and Quartile deviation are the absolute measures of dispersion.

e Plot Sales on X axis and # of days on Y axis

f $\bar{x} = \frac{\sum x_i}{n}$ Easy to understand & calculate
Is based on all values
Dements - Cannot calculate even if 1 value is missing. It is affected by extreme values.

g $b_{yx} = \frac{Cov(x,y)}{Var(x)}$; $b_{xy} = \frac{Cov(x,y)}{Var(y)}$

h $\mu_r' = E(x^r) = \frac{\sum x^r}{n}$ r^{th} raw moment

$\mu_r = E(x-\bar{x})^r = \frac{\sum (x-\bar{x})^r}{n}$ r^{th} central moment

i Pt $(\bar{x}\ \bar{y})$ is the point of intersection of 2 reg^ equations
If $r = 0$ the reg^ lines are $\perp^r$ to each other
If $r = \pm 1$ the reg^ lines coincide
$r = \pm \sqrt{b_{yx} \times b_{xy}}$

j SD = 26 Mode = 58 Median = 52.67

e Proof in usual notation showing relationship between μ_3 & μ_3'. μ_4 & μ_4'

$\mu_3 = \mu_3' - 3\mu_2'\mu_1' + 2\mu_1'^3$

$\mu_4 = \mu_4' - 4\mu_3'\mu_1' + 6\mu_2'\mu_1'^2 - 3\mu_1'^4$

f Positive skewness - Mean > Median > Mode
$Q_3 - Q_2 > Q_2 - Q_1$ & $\mu_3 > 0$

Negative skewness - Mean < Median < Mode
$Q_3 - Q_2 < Q_2 - Q_1$ & $\mu_3 < 0$

S.S: [HHH HTH HHT THT TTH HTT THH TTT
Probability of getting 2H = 3

(3)

b Mutually exclusive events are those which cannot occur simultaneously Ex Head & Tail are Mutually exclusive event.

Exhaustive events are those which together give up the sample space A: {H} B {T}
i.e. $A \cup B = S$.

c Addition Theorem $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

Multiplication Theorem — $P(A \cap B) = P(A) \times P(B/A)$

$= P(B) \times P(A/B)$

(Explaining all terms involved)

Complementary events — Non occurence of event A is known as its complementary event

Ex: $A = \{1\ 3\ 5\}$ $A' = \{2, 4, 6\}$

Bayes Theorem — Posterior probability

$$P(A_i/B) = \frac{P(A_i) \times P(B/A_i)}{\sum_{i=1} P(A_i) \times P(B/A_i)}$$

Explaining all terms involved.

(1) $P(A \cup B) = 0.90$ (2) $P(\bar{A} \cap \bar{B}) = 0.10$

a $\bar{x} = \frac{n_1\bar{x}_1 + n_2\bar{x}_2}{n_1 + n_2}$: combined Arithmetic mean

$\bar{x} = \frac{\sum w_i x_i}{\sum w_i}$; Weighted Arithmetic mean

(Explaining all the terms).

Diagrams for various scatter plots.

(4)

S-S: (1, 2, 3, 4, 5, 6)

Prob. of getting number $> 3 = \frac{3}{6} = \frac{1}{2}$

Mode: The value which occurs the maximum number of times.

It is easy to understand & simple to calculate

It is affected by extreme values

It can be calculated for open end classes distribution

Plot the graph by taking the values in pairs & obtain a scatter plot.