Final Assignment-1

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serial: 10

1) Calculate the trend value using semi average method

Year	2008	2009	2010	2011	2012	2013
Income	43	51	64	76	81	96

Ans:

Year	Income	3 years semi	3 years semi Avg	Trend values
2008	43	158	52.67	52.67-10.55=42.11
2009	51			42.11+10.55=52.67
2010	64			52.67+10.55 =6322
2011	76	253	84.33	63.22+10.55=73.72
2012	81			73.77+10.55=84.32
2013	96			84.32+10.35=94.82

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Here,

Difference between the central year

$=(2012-2009)=3$

Difference between the semi-averages.

$=(84.333-52.667)=31.666$

Increase the trend value for one year $=\frac{31.666}{3}=10.555$

(Ans)

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2)

Year	loan	3 Year semi total	3 Year semi Average
2004	40	----	-------
2005	42	121	40.333
2006	39	106	35.333
2007	25	91	30.333
2008	27	103	34.333
2009	51	106	35.333
2010	28	105	35
2011	26	85	28.333
2012	31	87	29
2013	30	109	36.333
2014	48	----	-----

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Ans to the Que No - 3

The transition Probability matrix,

$$P = \begin{bmatrix} P_{00} & P_{01} \\ P_{10} & P_{11} \end{bmatrix} = \begin{bmatrix} 0.6 & 0.4 \\ 0.8 & 0.2 \end{bmatrix}$$

We need P^{5}_{00} in P^5

$$P^2 = \begin{bmatrix} 0.6 & 0.4 \\ 0.8 & 0.2 \end{bmatrix} \begin{bmatrix} 0.6 & 0.4 \\ 0.8 & 0.2 \end{bmatrix}$$

$$= \begin{bmatrix} 0.68 & 0.32 \\ 0.64 & 0.36 \end{bmatrix}$$

$$P^4 = \begin{bmatrix} 0.68 & 0.32 \\ 0.64 & 0.36 \end{bmatrix} \begin{bmatrix} 0.68 & 0.32 \\ 0.64 & 0.36 \end{bmatrix}$$

$$= \begin{bmatrix} 0.6672 & 0.3328 \\ 0.6656 & 0.3344 \end{bmatrix}$$

$$P^5 = \begin{bmatrix} 0.6672 & 0.3328 \\ 0.6656 & 0.3344 \end{bmatrix} \begin{bmatrix} 0.6 & 0.4 \\ 0.8 & 0.2 \end{bmatrix}$$

$$= \begin{bmatrix} 0.66656 & 0.33344 \\ 0.66688 & 0.33312 \end{bmatrix}$$

The required Probility is 0.66656

(Ans)

Ans to the Que No.4

Given Pairsar rate $\lambda = 2$ per minute

(i) P(more than 1 minute) = $P(T>1)$

$= e^{-\lambda t}$

$= e^{-2\times 1}$

$= 0.13534$

(ii) P(less than 2 minutes) = $P(T<2)$

$= 1 - e^{-\lambda t}$

$= 1 - e^{-2\times 2}$

$= 0.98168$

(iii) P(between 1 to 2 minutes) = $P(1<T<2)$

$= e^{-\lambda t_1} - e^{-\lambda t_2}$

$= e^{-2\times 1} - e^{-2\times 2}$

$= 0.11702$

(Ans)