37 Manar Patilwan

SAIDS Assignment - 6 91. (x) (y) Sione Hours 0.5 Simple linear 57 64 0-75 51 Y= bo + b, x, 68 1-25 75 1.6 b1 = 2 (21-2) (41-4) 76 1-75 2 79 2.25 83 85 2-5 86 2.75 88 3 x = 133.75 = 2-25 Y= 79.2 3.25 15 3.5 90 94 3.75 (x-x)2 (x-x)(Y-Y) 96 71:75 0.0 3.0625 -22.21 12 38. 85 22-8 2.25 71:54-8 -15.2 T 3? 1.3125 28.25 -1.25 -26.2 41.17 F.P 71152 5-57 11.2 -0-751-P.P -S.231.22 3.9 0.3625 1.6 70.51 -3.2 10 1 0.025 0.05 0.0625 -6.25 -0-21125 N 0 3.8 1.45 0.0625 5.8 0.25 6. 3 6.8 3.4 0.025 6.6 0.5625 675 8-8 9.8 9.8 1.25 1.5625 FOR BEFORE TIONAL USE 13-5 undaram 1.75 22.1 2.25

21.4

29.4

3.0025

5 = 170 5 = 17.05 176 17.05 61 = 9.97 -D 10 = 7 - b1x = 79.2- (9.97) (2-25) bo = S6.7675 -(1) 4 = 56.7675 + 9.97x - (11) coefficient of deturnination

52 = 55t

SST 5-1 SSt= 2/4; -4, 22 x y = S6.7675 + 9.97 (0.5) = 61.7525 y: S6.7675+ 9.97(0-75) = 64.245 4 = 56.76754 9.97 (1) = 61.7375 = S1-7675+ 9.97(1.25) = 69.23 y= 56.7675+ 9.97(1.5) -71-72 : S6. 7675+ 9,97(1.75) = 75.21 4: (1.7675+ 9.97(2) = 76.70 = 79.2 = S6.767(+ 9.97(B2S) 56.767(+ 9.978.2.75) = 84.18 4 = S(.7671 + 9.97 (3) = 96:6475

FOR EDUCATIONAL USE

Sundaram

 $SSE = (S1 - 61.75)^{2} + (64 - 64.245)^{2} + (39 - 64.75)^{2} + (68 - 69.23)^{2} + (75 - 71.72)^{2} + (76 - 74.21)^{2} + (79 - 76.70)^{2} + (83 - 79.2)^{2} + (85 - 81.69)^{2} + (86 - 86.67)^{2} + (89 - 89.17)^{2} + (96 - 91.66)^{2} + (94 - 94.10)^{2} + (96 - 96.65)^{2}$

11- 211.1

= 131.22 - (1)

 $SST = \Sigma(\gamma_1 - \gamma_1)^2$ = 1980.28

 $3^2 = 31.212$ 1980.28

32 = 0.06225 (PEN) 2 = 122

A = 6.287. (A) - SIS = 1

Q2.

Sundaram

 X
 Y
 X-x
 Y-y
 (x-x)(y-y) (x-x)²

 5
 8
 -3.66
 -60
 21.96
 13.39

7 9 -1.66 -5 8.3 2.755

9 - 12 - 4.66 -2 9.32 21.715 15 26 6.34 12 76.08 50.195

15 26 6.34 12 76.08 90.195 12 6.68 11.18S

9 13 0-34 -1 0-34 0-115

X=8.66 X=14 £=122 £=99.736

FOR EDUCATIONAL USE

810pc b, = 122 89.336 b = 1.3657. - 1 bo: 7-6,51 50001-000 = 14- (1.3657)(8.66) SSE = 2(4) -41)2 x = 2(1) : SSE = 47.363 - 10 SST = 214 - (D) 1735.11 SSR = SST - SS & (17-4) 16-16-13 - X = 166.63 - (1). SSR= 166.63: Q3. Musticounearity happens when independent variables in regression model are highly cordated to each other. Independent variable can be predicted from another independent Variable in a regression model we would not be able to distinguish between the individual effects of independent variables on the dependent variable. It may not affect the accuracy of the model as much we night lose saliablity in determining the effect.

FOR EDUCATIONAL USE Sundaram)

	Overfitting a model is a condition where a statistical
	model letters to describe the sandom even in the
	data rather than the relationships between variables.
	This occur when the model is too complex Model
	performs better than on the training set than on the
	test set. It happens when the model learns the
	detail and noise in the training data to extent
	that it negatively impacts the performance.
Q4.	The least squares method is a statistical proudure
	to find the best fit for a set of data points by
	minimizing the sum of offsets or residuals of points
	from the plotted curve.
	Sum of squares of ever should be less when
	there was only variable.
	Step 1:- Plot the graph b/w variables.
of Less	Step 2 :- Look for a visual line. There can
	be more than I line, select the
74	line which gives min. residual value.
	Penvation
	y = 10 at 1 bx mans on bonds your 12 Cy- a-bn)2
4 10-11 11	de=y-latbx)
- <i>b</i>	Minimize. = 52(y-a-ln)(-x)
	82 202 = 5 (y-(a+bx))2
V C: 0.74	ds/=0 ds/=0
0.01	/aa = 2 (y-a-bx) da
	€ (y-a-bn)(-1)
to s	E(-2x)(y-a-1x)=0
j J	· · · · · · · · · · · · · · · · · · ·
(Jundaram)	FOR EDUCATIONAL USE

Ey nat b En - 1)

Eny = 9 Ent b En 2 - 11)

multiply egn 11) by n & en 0 by 52 $h = \frac{1}{1} + \frac{1}{1} +$ pivide by and named to be The state of the second secon Janen) Lange day Q.S. linear regression - It models the relationship between a dependent variable and one or more la explanatory. Variables using a linear on ex: pridict ment based on square feet alone. Multiple regression: If two or more explanatory variables have a linear relationship with dependent variable. It is broader class of regressions that encongrasses linear & non-linear one y & two or more X.

ey. predict rent based on aquan bot & age of for Educational USE (Sundaram)

(h)

				A comment of the second	T T		7
96.	In s	imple line	03 4	aillion.	hagan	60110	11/05
3990	to ca	loulate en	01 01	the na	ndett.	_ 5700	CV3,0
2431	Calculo	led by :-	buck)	11	2 1	
Alpes	17 mea	suring th	e dista	ance of o	bserved	1 1-0	alves
Ne de	from	suring the	licted	y-values	at c	ach V	alue NEX.
2331	i squ	axing eac	hoj t	here dist	ances	(17)	
	3 (a)	culating r	rean of	each of	the		ud dislance.
21000	157 25	0 00121	1181 0	00'	12.	112	rii e
()		MSt = {	(4, -4)	;)2			
			n			11.	V
	Coethic	ient of	detani	nation is	<u>a</u>	statist	ical
	measu	remend the	at e	xamines	ww_	dillere	nus in
	one	Variables	can be	explain	od I	my 2 the	dellerence
	in 2nd	8.0 C 5. K		11 38 18		2117	ř.c.
		82 = SS	<u> </u>	711513	1	1210	ألح
		35	۲.	781097		F2 70	71
				2001 6		29183	5
<u>97.</u>	Salary	40 E	Age	N1-71	Э Э,	2 72	May 204
	đ	(717)	(12) 15 - C. K	7	0511	0 1
				· · · · · · · · · · · · · · · · · · ·		6434	81
	26315	18	5	90	324	25	673670
(39493	0012 20	K	- (146)	500	49	789860
	37209	22	<u>~ 8</u>	176	485	44	818898
· · · · · · · · · · · · · · · · · · ·	24386	1-3	6	138	529	36	560750
	25751	21, 23	it il no	1) 1-61283	S29	49	592273
	44629	25	75	125	625	25	1115725
	37616	2 1000	8.	20116711	4	65	75232
	33305	28	' 6	168	784	36	932540
0	36.848	,29	5	14 S	841	25	1068592
Sundaram			FOR E	DUCATIONAL USI	3	,	

42551 25700 37303 4659 32617 35771	31 37 41 46 49	9 6 7 8 6	224 333 246 322 392 318	1024 1369 1681 2116	59 81 36 49 65	1361632 950900 1529623 1136316 1598233
25700 37203 4659 32617 3577)	37 41 46	9 6 7 8	333 246 322 392	1369	81 31 49	950906 1529423 1134314
25700 37203 4659 32617 3577)	37 41 46	6 7 8	333 246 322 392	1369	81 31 49	950906 1529423 1134314
37203 4659 32617 3577)	51 56 59	6 7 8	246 322 392	2116	36	1529423
3659 3577)	49	7. 8	322	2116	49	113 4314
3577)	49		392			
3577)			,			
haritan a	, L		111	2109	36	1895863
13 (() 1) 10			J	1014		
1/05/17 1	148	106	2994	15/20	P88	1497585
72.4		<u> </u>				
a de la companya de l	5	noite	15/11/10/21	1-6	15-11-11	*
131575	297			y = 27	367-8	n/4
			1 00 J	bat daring	nv v	10
	-11			7 = 20	7.867	0.1
•			. 34			
			1	n 2	,	
			V64	A PCY	1075	1,2 .1%
			4	(11)	Ù	
-	1	- 512				
12 2 2 1		y P	è	81	21	. 11
56. 32	12 4	nî'∿ . 5	- 20 s く 20	189	20 -161	1)(41)
2(4)	V 3	1 1		(0		16
12 1		St. C.	ē)	11	= 20	20 72
202 22	- Ca	v 1 (1	n- 3/1 n.	7 6 0 21		34.73
2(12)	- 68	3 C- CI	100) = 21	55	. , \\
< 5'	1 1/4	0.47	10.00%		0.40	1000
5x1. A	1= 14	8 7 1595	- (548)4	10517	- 2636	8 20.6
() 2	13.00	8 61	2 1 6	7 7	C 1	1778
12.4	30	16578	<u> </u>		18.	j. 6
	131575 276451 276451 297672 146280 180257 223155 200928 199836 185240 2(21) ² 2(21) ² 221, y	31575 297 276451 276451 297 276451 297 213	31575 291857 276451 276451 231260 297672 223818 156260 172613 180257 260926 123155 199836 19	$72 \cdot 9$ 131575 297857 276451 231260 297672 223818 146260 172613 180257 260926 213155 214626 200928 19980 1998	72.9 131575 291857 $7=27$ 276451 231200 297672 212818 $7=20$ 114260 172613 $7=6$ 18057 260926 213145 214626 200928 19930	31575 291857 31575 291857 31200 397672 32818 $3=29.867$ 314260 312612 $32=6.667$ 3180257 3160926 313155 315626 315626 316926

EX1. X2 = 7.33

by = (3x2)2 (2x1.y) - (5x1. 5x2) (3x2.y)

(Zn1)2(En2)2-(3x1.2)2

=(21-33)(2636820.6)- (7.33)()96577)

 $(2539-73)(21-33)-(7-33)^{2}$

= 53336466.66

541 58 373.36

6.984824 -1

Similary, b= 97873159

54158372.36

6, - 18.24045 -(1)

a = y - b1x1 - b2x2

a -27367.8 - (0.98487(29.867) - (18.247(6.67)

9 = 27367.8 - (29.5137) - 121.6099 = 27216-7773 -(11)

4 = 27216.7773+ 0.9849 n1+18.24x2.