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PES University, Bengaluru (Established under Karnataka Act No. 16 of 2013)

UE17CS322

DECEMBER 2020: END SEMESTER ASSESSMENT (ESA) B TECH 5^{TH} _ SEMESTER

UE17CS322 - Data Analytics

		ne: 3 Hrs	5			A	nswer	All Q	uestior	1S			Max Marks: 1	00
1	1-1	Use a f	owehort	to sum		1 0 11	•			110-24				
1	a)	(a) stepwise forward selection (b) stepwise backward elimination (c) a combination of forward selection and backward elimination												6
	b)	What are the value ranges of the following normalization methods? (a) min-max normalization (b) z-score normalization (c) z-score normalization using the mean absolute deviation instead of standard deviation (d) normalization by decimal scaling												4
	c)	Conside 22, 25, 2 these da given da	r the fol 25, 25, 25 ta, using ta.	lowing 6 5, 30, 33 g a bin 6	data (in 5, 33, 35 depth of	increas 5, 35, 35 f 3. Illu	strate y						19, 20, 20, 21, 22, in means to smooth s technique for the	6
	d)	How mig	ght you o	letermin	e outlie	rs in the	e data?							4
1	a)	Professor	Bell at	Belland	ur Univ	ersity, I	Bangalo	re belie	ves that	the cum	ulative	grade no	int average es per day) of	6
	- 1	(a) Calculate the Pearson correlation coefficient between CGPA and mobile phone usage of students. (b) Conduct a hypothesis test at a = 0.01 to check whether CGPA and mobile phone usage are negatively correlated. (c) Professor Bell believes that the correlation is less than -0.4. Conduct a hypothesis test at a = 0.1 to check whether the claim is correct. Table.1: Data of CGPA and mobile phone usage (Average minutes per day)												
		(c) Profe	d. ssor Bel ether the	l believe claim i	es that the	ne corre	lation is	s less th	ner CGI an –0.4.	A and r. Conduction	nobile p ct a hype	hone usa	age are negatively	
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b		d-1 ! !	1 1.				L	_						
- 1	A regression	model is dev	veloped bety	veen co	ruption p	erception	index a	nd p	er cap	oita ii	ncome	(in U	S	
	shown in Tabl	A regression model is developed between corruption perception index and per capita income (in US dollars) based on data on 20 countries. Regression model output obtained through Microsoft Excel is shown in Table 2. Note that Table 2 shows only partial output of the model developed. TABLE 14.												
	Regression ber	tween corru	ntion percer	tion ind	ly partial	output of	ine mo	del d	evelo	ped.	TAB	LE 14		
	Regression between corruption perception index (Y) and per capita (X) Table 2. Corruption Index and Gini Index.													
	Emilian Santana	-priori mack		RY OUTPUT				_						
	Regression Statistics		Johnson	11 001101	Carrier V			_						
	Multiple R													
	R Square													
	Adjusted R Square													
	Standard Error	10.94929												
	Observations	20				Neglie P								1
		df	SS											- 1
	Regression	1	5918.236	MS		Significance F								
	Residual	18	2157.964											
	Total													
		Coefficients	Standard Error	r-Stat	p-value	Lower 95%	Upper 95	96						
	Intercept		6.496415			5.773095	33.0700							
	Per Capita		0.00016	Y POLICE		0.000788	0.00146	1						
	(a) What propor	rtion of the o	corruption n	erceptio	n index i	s explained	l by ne	r car	ita?					
	(b) What is chai	nge in the va	alue of corru	intion p	erception	index for	very o	ne-d	allar	incre	ace in	ner co	mita	
	(c) is there a sta	atistically sig	gnificant rel	lationsh	p betwee	n corruptio	on perc	entic	on ind	ex ar	id ner	canita	apita:	
	- 0.01?											cupite	i ai a	
	(d) What is the	average corr	uption perc	eption in	idex whe	n per capit	a is \$30	0,000). Wh	at is	the			
	corresponding 9	5% confide	nce interval	?										
	(e) Per capita of	a country is	\$30,000. V	Vhat is t	he probal	oility that the	he corr	uptio	on per	cepti	on in	dex of	this	
	(e) Per capita of a country is \$30,000. What is the probability that the corruption perception index of this country is less than 50?													
	(f) Which of the	following s	(f) Which of the following statements are true based on the model shown in Table 13?(i) Corruption perception index and per capita are positively correlated.											
	(f) Which of the	following serception inc	dex and per	capita a	re positiv	ely correla	ted		ble 13	3?				-
	(f) Which of the (i) Corruption po	following s erception inderception in	dex and per dex and per	capita a capita a	re positiv are negati	ely correla	ted.	n Ta		3?				
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	a)	Wh	at is a	recom	mende	er eve	tem	2 In	who	t 1110	ava does it differ f	5		
	a)	system? How does it differ from a typical classification or predictive modeling system?												
	b)	practice.												
	c)	The movie ratings given by 4 customers (C1, C2, C3, and C4) on five movies (A, B, C, D and E) are given in Table 14.17.												
		5-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	TABLE 14.17 Movie ratin								_			
		_	vies →	Custom	er↓	A	В	C	D	E	=			
		9				4	1	3	2	4				
		ζ,				3	2	4	4	2				
l		<i>C</i> ,				3	3	4	4	4				
		C4				3	3	2	3	3				
	- 1													
		Use cosine similarity to find among customers C1, C2, and C3, who is the closest to customer Customer feedbacks on 5 training programs (on a 5-point scale) by 6 customers are provided in the following Table Tables5, Feedback on training programs												
•	d)	follo	wing T	able	cks on	5 trai	nın	g pr	custo	omei ms (ers C1, C2, and C3, who is the closest to customer (on a 5-point scale) by 6 customers are provided in the			
	d)	follo	wing T	able	cks on n trainin	o trai g progi	nın	g pr	custo	omei ms (ers C1, C2, and C3, who is the closest to customer (on a 5-point scale) by 6 customers are provided in the			
•	d)	follo	wing Tes	eedbad 'able dback o	n trainin M ₃	o trai g progi M ₄	ams	g pr	custo	ms (ers C1, C2, and C3, who is the closest to customer (on a 5-point scale) by 6 customers are provided in the			
	d)	follo	wing Tes5. Fee	able dback or	trainin M ₃	$\frac{5}{9}$ progr	ams	g pr	custo	ms (ers C1, C2, and C3, who is the closest to customer (on a 5-point scale) by 6 customers are provided in the			
	d)	Table C ₁ C ₂ C ₃	wing Tes5. Fee	Table dback or M2	trainin M ₃ 2	g progr $\frac{M_4}{4}$	nın	g pr	custo	ms (ers C1, C2, and C3, who is the closest to customer (on a 5-point scale) by 6 customers are provided in the			
•	d)	Table	wing Tes5. Fee	Table dback or M2	trainin M ₃ 2 2 3	g progr $\frac{M_4}{4}$	rams	g pr M ₅ 3 5	custo	omei ms (ers C1, C2, and C3, who is the closest to customer (on a 5-point scale) by 6 customers are provided in the			
	d)	Table C ₁ C ₂ C ₃	wing Tes5. Fee M ₁ 2 4	M ₂ 4 3	trainin M ₃ 2 2 3	g program 4 4 4 2	rams	g pr M ₅ 3 5 4	custo	ms (ers C1, C2, and C3, who is the closest to customer (on a 5-point scale) by 6 customers are provided in the			

_	SRN SRN	
a	Consider the markov chain as shown below,	6
	$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{3}$ $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{2}$ $\frac{2}{3}$	
n	Give answers for the following questions:	
	a. This Markov chain irreducible?	
	b. Is this Markov chain aperiodic?	
	c. Find the stationary distribution for this Markov chain.	
	d. Is the stationary distribution a limiting distribution for the Markov chain?	
b)	The number of customers arriving at a departmental store can be modelled by a Poisson process with λ =10 customers per hour. Find the probability that there are 2 customers between 11:00 and 11:20 am	4
c)	i). When a Markov chain is said to be ergodic?	4 (2+2)
	ii).Define a confounding variable?	\
d)	How to reduce Confounding Variables? And What Conditions Cause Omitted Variable Bias?	6 (3+3)