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Analitik Bisnis

UTS Semester Ganjil

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progressive thinking · people transformation · passion to lead · synergy through teamwork

Problem 1 (Regression Analysis)

A bakery owner in Jakarta conducted research on the factors that influence the number of bread sales (SALES) in his bakery. He suspected that there are 3 variables that can affect the number of bread sales. These variables included the number of workers (WORKERS), the number of bread machines (BREAD MACHINES), and the average work hour of workers (WORK HOUR). Based on sample from bread sales in some cities, the result of the multiple linear regression output were as follows (the significance level [α] used is 2,5%):

Regression Statistics	
Multiple R	0,337124599
R square	0,549641186
Adjusted R square	0,463498656
Standard error	0,537421073
Observations	20

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	0,81094451	2,548362486	20,32619422	0,00005
Residual	12	1,820015008	0,834905693		
Total	16	2,630959518			

	Coefficients	*Standard Error*	*tStat*	*P-value*
Intercept	-1,6533437	4,157709377	-1,015934622	0,000871797
Workers	0,024567319	0,987522119	0,448584888	0,000555345
Bread machines	0,338554528	0,366793854	0,515390864	0,000657287
Work hour	0,580474787	0,804131691	0,196654623	0,000779458

Required:

a) What are the dependent and independent variable in this case?
b) Determine the number of samples of bread sales used in this case!
c) Create a multiple regression equation based on the output above!
d) Explain the model's goodness of fit!
e) Explain the result of the F test (global test of hypothesis) based on the output presented! The explanation must include which hypothesis is rejected or can't be rejected and the basis for determining that hypothesis!
f) Do you agree with the statement "the higher the average work hour of workers, the higher the number of bread sales"? Explain your answer!
g) Give the conclusion from the regression results above!

Problem 2 (Forecasting-Weighted Average)

Below is the information of the supply for the past 10 years

Year	Supply
2020	235
2021	220
2022	250
2023	275
2024	260
2025	245
2026	280
2027	295
2028	255
2029	270
2030	300

Required:

a) Compute a 4-year-moving average forecast for 2024 through 2030!

b) Compute a 5-year-moving average forecast for 2025 through 2030!

c) Determine MAD and MAPD for the two estimates above! Compare them!

Problem 3 (Game Theory – Zero Sum Game)

Incumbent governor in Province AS will face his opponent, DFG, in the next governor election of the same province. The following payoff table shows the possible percentage point gains for DFG given the political strategies available to each politician. **Determine the optimal political strategy for both politicians**.

DFG Strategy	Incumbent Strategy		
	A	B	C
1	8	12	6
2	2	4	6

Problem 4 (Game Theory – Pure/Mixed Strategy)

Dami Corporation is a smartphone producer based in Hong Kong. The company has planned to expand its market into Canada. Recently, researchers in Dami Corporation successfully developed similar products with Pear Company, the market leader in Canada, at a cheaper cost. Therefore, Dami Executives are confident that their products could take a certain proportion of Pear's market. The following payoff table shows the number of people in thousands that will switch to using Dami Smartphones in Canada, with alternative marketing and pricing strategies for Dami and Pear.

Dami Strategy	Pear Strategy		
	A	B	C
1	25	10	8
2	16	1	6
3	9	7	15

Required:

a) Is this a pure or mixed strategy game?

b) Expected gain for Dami Corporation