REGRESSION TUTORIAL

1. The following table relates to the price of a recharge coupon of a mobile service provider & its demand (in thousands) in NCR region in 2007.

Price (in Rs Hundreds)	100	150	200	300	400	500	600
Demand (in thousands)	20	18	15	12	09	05	02

Fit a linear regression line of demand for top ups on price.

Ans: 81=7a+2250b, 18600=2250a+932500b, Regression line: Y=22.99-0.035X

2. The following data refer to the weekly consumption expenditure (C) and disposable income (I) of 7 families. Use the OLS method to predict the weekly expenditure of a family with a weekly income of $300. Also calculate the Coefficient of Determination and interpret the results.

C ($)	150	70	155	65	110	115	95
I ($)	260	80	240	100	160	180	140

Ans: 760=7a+1160b, 139900=1160a+219200b, Regression Line: Y=22.81 + 0.52X, R square = 0.974

3. Consider the following set of data:

X	13	6	14	11	17	9	13	17	18	12
Y	6.2	8.6	7.2	4.5	9.0	3.5	6.5	9.3	9.5	5.7

Estimate the regression line and state whether the relationship is significant?

Given ☐☐☐☐ = 130, ☐☐☐☐ = 70, X^2=1818, ☐☐☐☐ ☐☐☐☐ = 949, $(Yi - \hat{Y}i)^2$=27.34, $(Xi - \bar{X}i)^2$= 128, $t_{0.05,8}$ = 2.306

Ans: Regression Line: Y= 3.04 + 0.304X, Sb = 0.163, t = 1.860, tcal<tab, Relationship between x and y is not

4. The attendance (x) in hundreds at a race track and the amount (y) in millions of dollars was bet on six selected days is given in the following table:

X	117	128	127	119	131	135
Y	2.07	2.80	3.14	2.26	3.40	3.89

Find 90% prediction interval for the amount bet when the attendance is 120.

Given $\hat{Y} = -9.32 + 0.09X$, $t_{\text{table value}} = 2.132$, $\sum (Yi - \bar{Y})^2 = 2.39$