CH5440: MULTIVARIATE DATA ANALYSIS

QUIZ 1 04/03/22 9:00-9:50 AM ROLL NO: MM17B113

NOTE: FILL IN YOUR ANSWERS IN THE QUESTION PAPER ITSELF AND UPLOAD IT

The life expectancy in a country is considered to be strongly correlated with its average per capita expenditure on health. The annual per capita expenditure on health spent by a country (in terms of equivalent 2017 US $) and the corresponding average life expectancy in some of the years within the period 1970-2015 is given in the data set. Assume the following linear relation exists between life expectancy (y) and average per capita expenditure (x) : $y = ax + b$

(a) The sample mean of life expectancy is ___**79.08**__ years and average per capita expenditure is __**3162.74**__ US $

(b) The sample standard deviation of life expectancy is ___**2.53**___ years and per capita expenditure is ___**753.19**___ US $

(c) The OLS estimate of parameter *a* is __**0.003**___ and *b* is ___**68.61**____

(d) The TLS estimate of parameter *a* is __**0.003**___ and *b* is ___**68.61**____

(e) The additional per capita amount required to be spent by the country to increase life expectancy by an additional 5 years is ___**1691.6**___ US $

(f) If the country spends US $ 1000 on health, the life expectancy is known to be exactly 70 years. If the OLS regression line has to pass through this data then the estimate of parameter *a* is ___**0.0035**____

(g) The lower and upper bounds on the estimate for parameter *a* are ___**0.003313223**____ and __**0.003313222**____ respectively

(h) The estimated standard deviation of error in the measurements of life expectancy using OLS is ___**0.47**___ years

(i) Assuming that the errors in life expectancy data are normally distributed, the 95% confidence interval for the parameter *a* obtained using OLS is between ____**-205.95**____ and _____**205.95**____