MTH – 522: Advanced Mathematical Statistics

Homework 1

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Regression on Pearson’s Father-Son data.

Q1. Get the classical Pearson's father-son data by the following R commands.

Ans.

Text

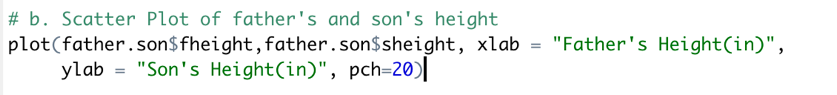
Description automatically generated

Table

Description automatically generated

Q2. Produce a scatter plot of father's height (x axis) Vs son's height (y axis).

Ans.



Chart, scatter chart

Description automatically generated

Q3. Add the regression line on the scatter plot.

Ans.



Chart, scatter chart

Description automatically generated

Q4. Add [the SD line](https://sites.google.com/view/umassdmth522/09-homework/homework-1/the-sd-line) (with blue color, different from the regression line) to the same plot.

Ans.

Text

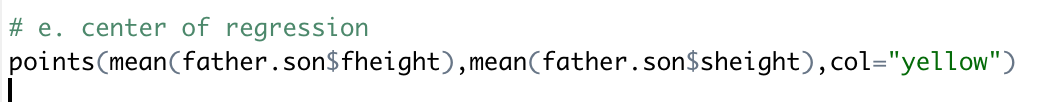
Description automatically generated with low confidence

Chart, scatter chart

Description automatically generated

Q5. Mark the center of regression.

Ans.



Chart, scatter chart

Description automatically generated

Q6. Add horizontal and vertical lines (green color) through the center of regression.

Ans.

Text

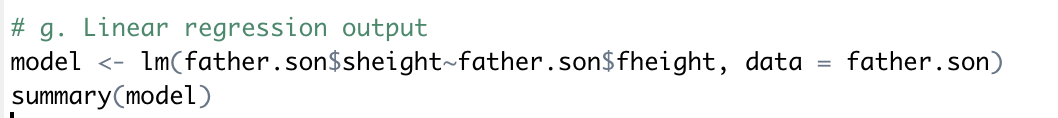
Description automatically generated

Chart, scatter chart

Description automatically generated

Q7. Report the linear regression output (including R^2 etc).

Ans.



Text

Description automatically generated

The errors are as follows:

1. RSE = 2.437
2. = 0.2513
3. = 361.2