

My first notebook

Chandan Kumar Pandey

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Activity uno

Advantage of R Markdown

Question 1:- Does the number of hours students study impact their grades?

Introduction You can write your introduction here

Method (Hypothetical) We conducted a survey in schools of Bangalore North Taluk to understand the impact of the number of hours of study on student final scores. Student's parents were interviewed during parent-teacher meetings (PTA) to collect data on number of hours the child. Further from the school records, we collected overall final grades. To assess the impact of study time and course taken on the overall grades, we fitted a linear regression model with the number of hours as the independent variable and number of courses enrolled in and marks are response variable; ($marks = \beta_1 * Numberofcourse + \beta_2 * Hoursstudy + \epsilon$), where $\epsilon \sim N(0, 1)$. All analyses were performed in R statistical software R version 4.3.1 (2023-06-16 ucrt) (R Core Team (2019)).

Results A total of 100 student records were collected, with the number of courses students were enrolled in ranging between 3 and 8. Based on parents' interviews, on average, students studied for 4.08 hours per day (ranging from 0.1 to 7.96 per day). Further, the average mark scored was 24.42 in log scale, ranging from 5.61 to 55.3..

```
model <- lm(Marks~number_courses+time_study,data = student_marks)
anova_table <- anova(model)%>%as.data.frame()%>%round(3)
model_summary <- summary(model)
summary_table <- model_summary$coefficients%>%as.data.frame()%>%round(3)
rownames(summary_table) <- c("Intercept","Courses enrolled-in","Per day hours of study")
```

In our model, the number of courses(1,283.298, $p<0.005$) and study times (1,1246.281, $p<0.005$) were significant in explaining the student's grades in the final examination (**Table 1**). Overall, our model was able to explain 93.91% of the variation in the marks of students. With the increase in each course, the student average grades improved by -7.456(1.174). Similarly, each extra hour of study will increase the score by a factor of 1.864(0.202) (Table 2, Fig1)

Table 1: Table1 in latex: Annova output of the model

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
number_courses	1	3538.880	3538.880	283.298	0

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
time_study	1	15568.180	15568.180	1246.281	0
Residuals	97	1211.696	12.492	NA	NA

Table 2: Table2 in latex: model summary

	Estimate	Std. Error	t value	Pr(> t)
Intercept	-7.456	1.174	-6.349	0
Courses enrolled-in	1.864	0.202	9.243	0
Per day hours of study	5.399	0.153	35.303	0

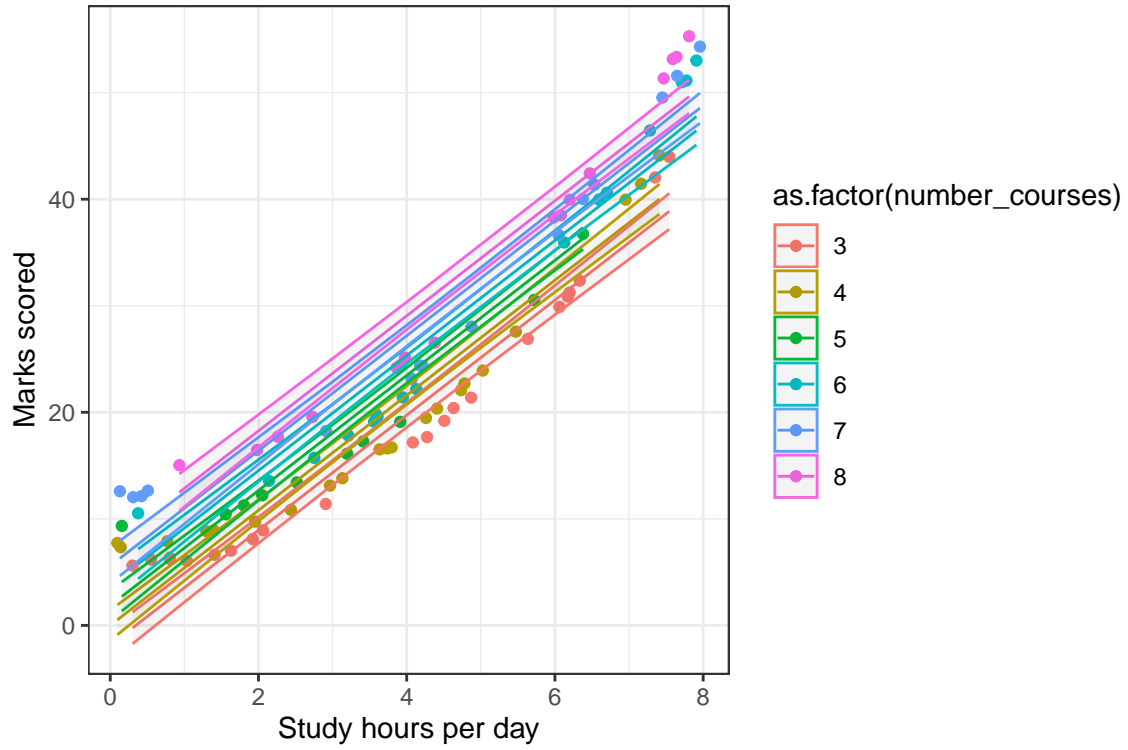


Figure 1: Student performace in relation to number of hours study and courses enrolled in

Discussion

1. Our study align with results of Yu (2011) and Borg *et al.* (1989) that with more study we can get good grades
2. It was surprising that several courses also increased the overall mark. This may be due to the following reasons
 - Generally, people who study more take more courses.
 - The average of many subjects compensates for few bad results.

References:

- BORG M.O., MASON P.M. & SHAPIRO S.L. 1989. — The case of effort variables in student performance. *The Journal of Economic Education* 20 (3): 308–313
- R CORE TEAM 2019. — *R: A language and environment for statistical computing*. Vienna, Austria, R Foundation for Statistical Computing.
- YU D.D. 2011. — How much do study habits, skills, and attitudes affect student performance in introductory college accounting courses?