程序代写代做 CS编程辅导

IEOR 156/256: Healthcare Analytics

Homework 8

Thursday, 11:59pm PST

For this homework, we will be using R and RStudio to perform linear and logistic regression. Download R and RStudio at https://posit.co/download/rstudio-desktop/. Download `lme4` package with the command `install.packages("lme4")`. Update Matrix package using the command `install.packages("Matrix")` if necessary.

WeChat: cstutorcs

Problem 1 Generalized Linear Mixed-Effects Model [20 points]

Assignment Project Exam Help

For this problem, we use the data of birthweights of first-born to last-born infants from mothers (each of whom had five children) from vital statistics in Georgia. The csv file can be found in the bCourses Files[1].

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1. Perform generalized linear mixed-effects model using `glmer` command. Use `initage`, `timeesnc` (the number of years since first baby), `birthord` (order of baby born) as fixed effects, and `momid` as random effect variable. The commands are given below.

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```
> library(lme4)
> data <- read.csv("your-directory-to-csvfile/gababies.csv")
> model <- glmer(lowbrth ~ initage + timesnc + birthord + (1 | momid),
+                data = data, family = binomial(link = "logit"))
> summary(model)
```

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   Paste the output as your answer to this part. You may ignore warning messages. (4 points)

2. Consider a newborn baby who is a 5th child born to a mother who has a initial birth age of 15 and timesnc of 10. This baby had a birthweight that was considered to be low (i.e. `lowbrth == 1`). Compute the effect of this mother to give birth to a child with low birthweight. (8 points)

3. The random effect (momid) has a variance of 2.311. Calculate the intraclass correlation coefficient (ICC) for the model, which represents the proportion of the total variance in the odds of giving birth to a child with low birthweight that is attributable to differences between mothers. Use $\frac{\pi^2}{3}$ for σ^2_{within}. (8 points)

[1] Vittinghoff E, Glidden D, Shiboski S, McCulloch C. Regression Methods in Biostatistics. New York: Springer Science+Business Media; 2012.