

ANDROID UPRISING

Address as many of the questions as you can. Don't sweat it if you can't answer all of these questions in the allotted time. Just focus on the easier ones to start off and see how far you can get. Use any resources you wish. Feel free to consult the internet and any books or notes. Also, feel free to use any previous code/syntax that you previously developed. No AI!

Lower difficulty

1. What is the `unit_name` of the most dangerous android
2. Calculate the mean `volt` score per `gibbs` and `chip_type`.
3. Is there a relationship between `volt` and `heat`?
4. Build a linear model. The outcome will be `kill` and the predictors will be `speed` and `agility`. Create a table of the parameter estimates from the model
5. Build a linear model. The outcome will be `kill` and the predictors will be `speed`, `agility`, `vk`, and `gibbs`. Create a table of the parameter estimates from the model
6. Build a linear model. The outcome will be `kill` and the predictors will be `speed`, `agility`, `vk`, `gibbs`, `volt`, `heat`, `force`, and `chip_type`. Create a table of the parameter estimates from the model
7. What is the predicted number of kills for an android who runs at a top speed of 35, an agility score of 7, a vk of 400, and has `neuromancer` as their AI model.

Higher difficulty

8. We might be interested in the relationship between `chip_type` and `agility`. We would like a graphical method for examining this. Specifically, you need to create bar plots that displays the count of `agility` scores corresponding to each `chip_type`. Facet by `chip_type`.
9. Compare the three linear models that you made. Which one makes better out of sample predictions given the number of effective parameters?
10. Create a scatterplot with `kill` on the y-axis and `speed` on the x-axis. Also incorporate `vk`. Facet that by `gibbs`. Also add a regression line for each faceted plot. Describe what you see.
11. We might be particularly interested in the AI models that are being used for the androids, as supposedly, `neuromancer`, is a particularly vicious one. Specifically, we want an index of the relative strength of evidence from the data about the hypotheses (i.e., the change from prior to posterior odds brought about by the data; i.e., a Bayes factor). Calculate that and summarize what you found.
12. In the first question you needed to find the `unit_name` of the most dangerous android. Now, make a function that does that! In other words, make a function that allows you to find the cell that is the name for the corresponding highest value in another column. Find the row index of the maximum value in the specified column. Make sure that you include all function syntax and a test to so that we can see that it works.