Software Analytics - Assignment 1

Due date: 12:00 am Sep 5, 2023.

General information

You can use all available resourses: notes, AI apps, Google search... But you need to do all the work on your own. You cannot discuss or share your work with your friends or classmates.

The instructor and TA will not provide any clarification or suggestions. You should work with the best of your knowledge and understanding.

You need to submit a document containing your answers and the R code you use to produce the analysis and answers. You should copy the analysis results and figures produced to your answer document (PDF or word doc).

Files to be submitted: word/pdf (each problem should contain a description of your solution, the code and screenshot) and the history file.

Question

Q1 (2 pt). Plot the function $y = x^3 - 2x + 1$, for x from -10 to 10.

Q2 (2 pt). Given two vectors *x* and *y*. Write expressions in R to calculate their Eulidean distance and dot product?

Load the dataset auto.csv (given in the shared Google folder) into R. This dataset has some columns:

name: name of the car model (e.g., bmw 2002)
origin: where the car is produced. 1 = US, 2 = EU, 3 = Asia.
mpg: miles per gallon (the higher the better).
weight: weight in lbs
model_year: the model year
horsepower: the engine power (measured in horsepower). The higher the stronger.
cylinders: the number of cylinders in the car engine. The higher the stronger.

Write R code to answer:

Q3 (1 pt). Which car has the highest mpg?

Q4 (2 pt). What is the average mpg of US cars, EU cars, and Asian cars? Are Asian cars more fuel efficient?

Q5 (1 pt). Which car is strongest (highest horsepower)?

Q6 (2 pt). How many car models are in each year? Which year has the most models?