R & Decision Tree Assignment

Instructions:

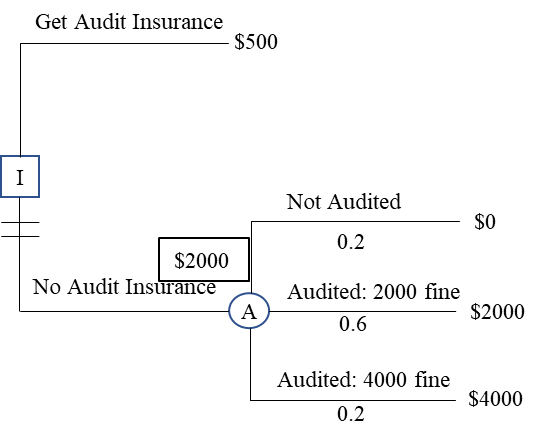
* For Question 1, submit your text file and image that I will submit to my professor.
* For Question 2, you can scan/take photos that I will submit to my professor.

**Question 1** (20 points): Make a choropleth of project 1 total purchase order amounts by state. Use the “Project 1 Supplier” and “Project 1 Purchase Orders” CSV files on D2L. Include a title, legend, and use a continuous color scale. Again, save your script in notepad or a similar text editor. I will evaluate this question by copying and pasting your script into my RStudio (other than setting the working directory) and will run it as is. You must also submit your choropleth as a png, jpeg, or pdf file to the question 2 assignment folder. Use the notes handout as an example and it is fine to keep the default output of states with values of 0 being filled in with black.

**Question 2** (25 points): Professor Harris is putting together his tax return and is considering whether or not to purchase audit insurance. The way the audit insurance works is that if he is audited and fined, then the insurance covers the cost of the fine regardless of the fine amount. Professor Harris draws the following decision tree and determines that he should purchase the insurance. Note that this decision tree depicts the payoffs as costs, so smaller is better. You can depict the payoffs as losses (negative values) in which case higher is better if you want.

I = Purchase Audit Insurance or not

A = Audited and Results of Audit



Professor Harris does a little more research and sees that Professor Gamble gives audit predictions for $500. Looking at Professor Gamble’s historical performance, Professor Harris sees that

When the audit result is not audited, Professor Gamble

* correctly predicted “Not Audited” 70% of the time
* incorrectly predicted “Audited: 2000 fine” 20% of the time
* incorrectly predicted “Audited: 4000 fine” 10% of the time

When the audit result is audited: 2000 fine, Professor Gamble

* incorrectly predicted “Not Audited” 20% of the time
* correctly predicted “Audited: 2000 fine” 60% of the time
* incorrectly predicted “Audited: 4000 fine” 20% of the time

When the audit result is audited: 4000 fine, Professor Gamble

* incorrectly predicted “Not Audited” 5% of the time
* incorrectly predicted “Audited: 2000 fine” 15% of the time
* correctly predicted “Audited: 4000 fine” 80% of the time

Should Professor Harris hire Professor Gamble? Draw the nature tree (5 points), information tree (10 points), and decision tree depicting whether Professor Harris should hire Professor Gamble or not (10 points). For the sub-branch for the “Not Hire Professor Gamble” alternative, you do NOT have to redraw the entire tree from above, just show the overall EMV of that sub-branch and the chosen alternative. You can round all probabilities to the nearest 2 decimal places for calculations.