CSCI 431 Programming Project

Write a program in Python to evaluate the supplied airline flight data. Analyze the input file to determine the best circumstances for booking a seat on a flight that will not be cancelled and will deliver you to your destination. Examine the effect of the following: Distance, Carrier, Origin City, Destination City, Aircraft, Month, State, and combinations of these. The source of the input file is http://www.transtats.bts.gov/DL_SelectFields.asp?Table_ID=259&DB_Short_Name=Air%20Carriers

The program will
1. Operate in two modes. First, the program should run without user input and provide the user of the program with the best flight options based on each individual evaluation criteria and *some* preset combination of categories. Second, allow the user to select the input criteria for which they want best options for successful flights.
   a. For mode 1: The developer will select the preset combinations.
   b. Mode 2 example: if the user selects origin city of Charleston and June, the program should provide the best flight options using the other criteria.
2. At a minimum, use scheduled versus performed departures together with the number of available seats to make your evaluation decisions.
3. Examine the effect of the following: Distance, Carrier, Origin City, Destination City, Aircraft, Month, State, and combinations of these (minimum of three combinations).
4. Evaluate distance ranges based on the following increments: increments of 100 miles up to 499, then in increments of 500. {500-999, 1000-1499, etc}
5. Output recommendation(s) to the user of best chance for a successful flight and why.
6. Display a 'table' of statistics to support the recommendation (supports the why above). Display in descending order of best

Idea only Example 1

Carrier	Sch to Perf %	Sch to Perf w/seats
Carrier A3	100%	50%
Carrier B2	50%	50%
Carrier A12	20%	30%

Idea only Example 2
For a user selection of October the program might display
Best flight choices for October

Aircraft	Origin City	Destination City	Distance	ETC
123 Stats	CLT Stats	Tallahassee Stats	500-999	ETC
ABX Stats	LAX Stats	CLT Stats	ETC	

Flight 638 and origin Columbia   stats
Flight 655 and destination Charleston stats

7. Create a GUI for the program.
   a. At a minimum allow the user to select which mode to run the program.
   b. Allow the user to select single and multiple criteria in mode 2.
8. Write a project summary that includes
   a. A title page, page numbers and section headers for each section identified
   b. A description of the calculations you made (algorithms) for selecting the
      i. Best of each category

           ii. Best when combining categories
          iii. Best based on user selection.
- c. A description of how you coded the program
- d. A description of any intermediate files
- e. Identify GUI, OS, and Python version used.
- f. The results of mode 1 in #1 above with the explanation of why these recommendations were made and the supporting table of statistics/calculations.
  - i. Include testing evidence using test files.
- g. Results/tests showing mode 2 with explanations and supporting statistics/calculations; identify the combinations.
  - i. Include testing evidence using test files and full data file
- h. A description of how you tested and validated the program.
- i. Acknowledgement of any collaboration efforts. For example, you might modify your design based on a question in class about another student's design.

You will need to write several modules to compute statistics and determine which of the categories and combinations of categories are most successful.

You will also need to examine the file of airline flight data to determine how it needs to be read by your program and how you will code the input data. You may choose to create a new intermediate file. If you create a new input file, submit this file when you submit the project. If the original file is used as input to the program you do not need to submit the file.

The first part of your assignment is to design the program. Determine and design the modules that will be used in your analysis. Determine your GUI. You should create some small files to test and validate your program. We can jointly discuss your design and test files in class; however, your program and explanation must be your own effort.

Turn in by e-mail your **code** (as a separate python file), copies of your **test results with matching input (including small test files) and output** and your **project summary**. If you created an intermediate data file outside your program as input to the program submit that file(s).
[Turn in by printout your **code**, copies of your **test results with matching input and output, and project summary.]**

The data file for your evaluation should contain one year of data for flights originating or ending in NC or SC.

The complete 2018 data is not yet posted. Data is currently available through September.