QMB 6315: Python for Business Analytics
College of Business
University of Central Florida
Spring 2025

Assignment 2

Due Sunday, April 13, 2025 at 11:59 PM
in digital form in your GitHub repository.

Instructions:

Complete this assignment within the space on your *private* GitHub repo (not a fork of the course repo QMB6315S25) in a folder called `assignment_02`. In this folder, save your answers to Questions 1 to 3 in a file called `airplane_data_prep.py`, following the sample script in the folder `assignment_02` in the course repository. When you are finished, submit it by uploading your files to your GitHub repo using the approach outlined in Question 4. You are free to discuss your approach to each question with your classmates but you must upload your own work.

Question 1:

The folder `assignment_02` contains an Excel workbook `airplane_data.xlsx` with three worksheets: `airplane_sales`, `airplane_specs`, and `airplane_perf`. Between the three worksheets, the Excel workbook `airplane_data.xlsx` contains the following variables.

`SALE_ID`	=	a unique key for each airplane sold
`price`	=	price of an airplane
`ceiling`	=	the maximum flying height of an airplane, in feet
`cruise`	=	the cruising speed, in MPH
`horse`	=	the horsepower of the engine
`fixgear`	=	an indicator for fixed landing gear (i.e. wheels are not retractable)
`fuel`	=	the volume of the fuel tank, in gallons
`pass`	=	the number of passengers an airplane can accommodate
`tdrag`	=	an indicator that a wheel is on the tail (a tail-dragger)
`wtop`	=	an indicator that the wings are above the fuselage
`age`	=	age of the aircraft, in years

Use this dataset to estimate regression models to predict the prices of airplanes.

a) Read in the `airplane_sales` worksheet and store it in a data frame called `airplane_sales` in your workspace.

b) Calculate and copy the printed output from a summary of the data using the `.describe()` method.

c) Estimate a regression model to predict `price` as a function of `age`. Copy the printed estimation output from the command `print(reg_model_sales.summary())` .

Question 2:

Now use two worksheets `airplane_sales` and `airplane_specs` in the the Excel workbook `airplane_data.xlsx`. Use the variables from both datasets to estimate a better regression model to predict the prices of airplanes.

a) Read in the `airplane_specs` worksheet and store it in a data frame called `airplane_specs` in your workspace.

b) Form a dataset `airplane_sales_specs` by `concat`enating the data frames `airplane_sales` and `airplane_specs`. Store the new dataset in a data frame called `airplane_sales_specs` in your workspace.

c) Calculate and copy the printed output from a summary of the data using the `.describe()` method.

d) Estimate a regression model to predict `price` as a function of `age`, `passengers`, `wtop`, `fixgear`, and `tdrag`. Copy the printed estimation output from the command `print(reg_model_sales_specs.summary())` .

Question 3:

Now use all three worksheets `airplane_sales`, `airplane_specs`, and `airplane_perf` in the the Excel workbook `airplane_data.xlsx`. Use the variables from these datasets to estimate an even better regression model to predict the prices of airplanes.

a) Read in the `airplane_perf` worksheet and store it in a data frame called `airplane_perf` in your workspace.

b) Form a dataset `airplane_full` by `concat`enating all three datasets. Store the new dataset in a data frame called `airplane_full` in your workspace.

c) Calculate and copy the printed output from a summary of the data using the `.describe()` method.

d) Estimate a regression model to predict `price` as a function of `age`, `passengers`, `wtop`, `fixgear`, and `tdrag`, as well as `horse`, `fuel`, `ceiling`, and `cruise`. Copy the printed estimation output from the command `print(reg_model_sales_specs.summary())` .

Question 4:
Upload your code to your GitHub repo using the interface in GitHub Desktop.

1. Save your file within the folder in your repository in GitHub Desktop.

2. When you see the changes in GitHub Desktop, add a description of the changes you are making in the bottom left panel.

3. Press the button "Commit to main" to commit those changes.

4. Press the button "Push origin" to push the changes to the online repository. After this step, the changes should be visible on a browser, after refreshing the page.