Istanbul Medipol University
School of Engineering and
Natural Sciences
Computer Engineering

2021 – Assignment #3
Advanced Programming
Assignment Date: 01.05.2021
Due Date: 14.05.2021

Programming Assignment #3

(Use a jupyter notebook to solve the following Pandas exercises)

Question I (45 pts): Download automobiles data from Google Classrom.

a. Write a Pandas program to read a dataset from automobiles DataFrame and modify the default columns values and print the first 10 rows.

b. Write a Pandas program to select a series from automobilesDataFrame. Print the content of the series.

c. Write a Pandas program to create a new Company - Price' Series (use bracket notation to define the Series name) of the automobiles DataFrame

d. Write a Pandas program to remove body style, engine type, length columns at once of the automobiles Dataframe

e. Write a Pandas program to sort the entire automobiles DataFrame by the price Series in ascending and descending order.

f. Write a Pandas program to find average price and change from nan to average price according to other automobiles of same company.

g. Write a Pandas program to find the automobiles that are either hatchback or wagon.

h. Write a Pandas program to read rows 0, 5, 7 and all columns of automobiles DataFrame.

i. Write a Pandas program to calculate the memory usage for each Series (in bytes) of automobiles and total DataFrame and delete 3 feature which have maximum memory and calculate the memory usage for each Series (in bytes) of automobiles and total DataFrame.

Question II (55 pts):

a. Download student course data from the following URL into a dataframe as follows:

url = http://www.akyokus.com/COE-101-Grades.xlsx

print students data.

b. Suppose that midterm I has %25 weight, midterm II has %25 weight, and final has %50 weight. Calculate the avegrage of each.

c. Convert each of NaN values to zero.

d. Suppose that the letter grades is evaluated as follows:

```
If NumberArg >= 94 Then
   GRADE = "A+"
Else If NumberArg >= 87 Then
   GRADE = "A"
Else If NumberArg >= 79 Then
   GRADE = "B+"
```

```
Else If NumberArg >= 70 Then
   GRADE = "B"
Else If NumberArg >= 60 Then
   GRADE = "C+"
Else If NumberArg >= 50 Then
   GRADE = "C"
Else If NumberArg >= 45 Then
   GRADE = "D+"
Else If NumberArg >= 40 Then
   GRADE = "D"
Else If NumberArg <  40 Then
   GRADE = "F"
End If
```

Add a column to your student dataframe named GRADE that contain the letter grade of each student. Print students data along with grades.

e. Assume that the passing grade is C. Find the students who failed the course.

f. Assume that the passing grade is C. Find the students who passed the course.

g. Prepare a pivot table that shows the count of students that took A, A, B+, B,..,F.

f. Prepare a histogram graph that shows the count of students that took A, A, B+, B,..,F.

g. Prepare a pie graph that shows the count of students that took A, A, B+, B,..,F.

h. Find the correlation between MIDI and MIDII, and between MID II and FINAL. Make an interpretation about the correlations that you found.

i. Find the average of MIDI and MIDII grades. Find the students whose final grades increased more %10 than the average of MIDI and MIDII grades. Make a listing of these students.