Q1 Notes

0 Points

Academic Honesty

It is a violation of the Academic Integrity Code to look at any reference material other than your textbook and lecture notes, or to give inappropriate help to someone or to receive unauthorized aid by someone in person or electronically via messaging apps such as WhatsApp. Academic Integrity is expected of all students of Hacettepe University at all times, whether in the presence or absence of members of the faculty. Do NOT sign nor take this exam if you do not agree with the honor code.

Moreover, each student is expected to turn on their camera on the related zoom session during the final exam.

Understanding this, I declare I shall not give, use or receive unauthorized aid in this examination and turn on my camera during the exam.

Signature (Specify your name and surname as your signature)

Mehmet Taha USTA MTUSTA

Notes about the exam

- If you think there is an error in the questions, please write `Error` in the provided space for the answer.
- While writing a list in the provided space, you should not use white space between items. A proper answer should be like this: `[1,2,3]` If you do not obey this specification, you won't have full credits.

Q2 Exceptions

14 Points

Consider the code below and its output, i.e. "G\nH". The code contains four blanks (1-4), for which you have four options (A-D) to

fill in.

```
class Exception1(Exception):
    pass

class Exception2(Exception1):
    pass

class Exception3(Exception1):
    pass

def whichExceptions():
    try:
        try:
            raise _______(1)________

        except _______(2)________:
            raise Exception3()

        except _______(3)________:
            print('G')

        try:
            raise Exception3()

        except Exception3:
            print('G')

        print('H')

    except _______(4)________:
        print('G')

    print('H')

whichExceptions()
```

```
G
H
```

Which of the options below would not produce the given output.

```
A) 1-Exception2() 2-Exception1 3-Exception2 4-Exception3
B) 1-Exception1() 2-Exception1 3-Exception2 4-Exception1
C) 1-Exception2() 2-Exception1 3-Exception2 4-Exception1
D) 1-Exception2() 2-Exception1 3-Exception2 4-Exception2
```

- ○ A
- ○ B
- ○ C
- ◉ D

Q3 File IO

16 Points

Consider the program below and its output. The program creates a file (i.e., "roster.dat") containing students in a class. Then, it modifies the file.

At the beginning of the file there is a metadata of 5 characters, which is used to hold the number of students in the class. Then the records of students follow, each of which is 19 characters long. A student record consists of 4 fields, i.e., name of the student, his/her grades in midterm and final exams, and his/her total grade. The total grade is computed by using the formula "midterm*0.4 + final*0.6". The for loop in the code simply visits student records and update the total value according to the formula.

Fill in the blanks to complete the program.

Important note: Use variable names only to fill in the blanks. Do not use numbers.

```
# Define constants
lenMetadata = 5
lenName = 10
lenMidterm = 3
lenFinal = 3
lenTotal = 3
recordLength = lenName + lenMidterm + lenFinal + lenTotal

# Create the roster file containing three students
f = open("roster.dat", "w")
f.write("00003")
f.write("Fuat      060070000")
f.write("Erkut     080090000")
f.write("Aykut     070080000")
f.close()

f = open("roster.dat", "r+")
numberOfRecords = int(f.read(lenMetadata))

for i in range(numberOfRecords):
    offset = _______(1)_______ + i*_______(2)_______
    f.seek(offset)
    name = f.read(lenName)
    midterm = int(f.read(lenMidterm))
    final = int(f.read(lenFinal))
    total = int(midterm*0.4 + final*0.6)
    print(name, midterm, final, total)
    f.seek(_______(3)_______ + lenName + lenMidterm + lenFinal)
    f.write(str(total).zfill(_______(4)_______))

f.close()
```

```
Fuat       60 70 66
Erkut      80 90 86
Aykut      70 80 76
```

Hint:

str.zfill(width): Return a copy of the string left filled with ASCII '0'

digits to make a string of length width, e.g., "99".zfill(5) would return "00099".

Q3.1
4 Points

What should come blank #1?

lenMetadata

Q3.2
4 Points

What should come blank #2?

lenName

Q3.3
4 Points

What should come blank #3?

lenTotal

Q3.4
4 Points

What should come blank #4?

recordLength

Q4 Data Science
10 Points

Complete the code below by filling in the blanks 1 to 5 so that the code can produce the given outputs.

Important note: Do not use space character in your answers. Otherwise, autograding would be a problem. For instance, "sum( )", "sum ( )", and "3 < 5" are all wrong inputs. Corrects forms would be "sum()" and "3<4".

In [1]:
```
import pandas as pd
import numpy as np
dict = {'A': [40, 60,     np.nan,    50],
        'B': [30, 40,     60,        np.nan],
        'C': [50, np.nan, 45,        np.nan],
        'D': [10, 10,     np.nan,    40]}

# create a dataframe from a dictionary
df = pd.DataFrame(dict)

# show the content of the dataframe
df
```

Out[1]:

	A	B	C	D
0	40.0	30.0	50.0	10.0
1	60.0	40.0	NaN	10.0
2	NaN	60.0	45.0	NaN
3	50.0	NaN	NaN	40.0

In [2]:
```
# Your code comes here to produce the output below.
df._____(1)______(df._____(2)______, inplace=True)
df
```

Out[2]:

	A	B	C	D
0	40.0	30.0	50.0	10.0
1	60.0	40.0	50.0	10.0
2	60.0	60.0	45.0	40.0
3	50.0	60.0	50.0	40.0

In [3]:
```
df["E"] = df._____(3)_____(axis = 1)
df
```

Out[3]:

	A	B	C	D	E
0	40.0	30.0	50.0	10.0	130.0
1	60.0	40.0	50.0	10.0	160.0
2	60.0	60.0	45.0	40.0	205.0
3	50.0	60.0	50.0	40.0	200.0

In [4]:
```
df[df _____(4)_____ 40] = np.nan
df
```

Out[4]:

	A	B	C	D	E
0	40.0	NaN	50.0	NaN	130.0
1	60.0	40.0	50.0	NaN	160.0
2	60.0	60.0	45.0	40.0	205.0
3	50.0	60.0	50.0	40.0	200.0

In [5]:
```
df._____(5)_____(axis=1, inplace=True)
df
```

Out[5]:

	A	C	E
0	40.0	50.0	130.0
1	60.0	50.0	160.0
2	60.0	45.0	205.0
3	50.0	50.0	200.0

Hint: You might want to try *dropna, fillna, max*, and/or *sum* functions in your answers.

Q4.1

2 Points

What should come to blank #1?

fillna

Q4.2

2 Points

What should come to blank #2?

max

Q4.3

2 Points

What should come to blank #3?

sum

Q4.4
2 Points

What should come to blank #4?

values

Q4.5
2 Points

What should come to blank #5?

dropna

Final Exam - Part 1

GRADED

STUDENT
MEHMET TAHA USTA

TOTAL POINTS
26 / 40 pts

QUESTION 1
Notes **0** / 0 pts

QUESTION 2
Exceptions **14** / 14 pts

QUESTION 3
File IO **4** / 16 pts

3.1	(no title)		**4** / 4 pts
3.2	(no title)		**0** / 4 pts
3.3	(no title)		**0** / 4 pts
3.4	(no title)		**0** / 4 pts

QUESTION 4

Data Science **8** / 10 pts

4.1	(no title)		**2** / 2 pts
4.2	(no title)	R	**2** / 2 pts
4.3	(no title)		**2** / 2 pts
4.4	(no title)		**0** / 2 pts
4.5	(no title)		**2** / 2 pts