National University

of Computer & Emerging Sciences Peshawar Campus

Name: _____ Section___ Roll No: _____

Program: CS
Semester: Fall – 2020
Time Allowed: 1 hour 30 Minutes
Course: Programming Fundamentals Lab (CL118)

Examination: Lab Exam
Total Marks: 50
Date: 09th February, 2020
Lab Instructor: Muhammad Hamza

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1. (DO NOT USE BUILT-IN FUNCTIONS)

Write a python function sec_max(l) that takes a list as a parameter and return the second maximum value.

2. (DO NOT USE BUILT-IN FUNCTIONS)

a. Write a python function that takes matrix 2x2 (nested list) as a parameter and return the transpose of matrix

(Hint Transpose of matrix is converted row in to column)
For example

$$\text{If } A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

$$\text{Then } A^T = \begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix}$$

b. Write a python function that takes matrix 2x2 (nested list) as a parameter it will calculate the Determinant of 2x2 matrix and return the value of determinant

$$A = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \quad |A| = ad - bc$$

Determinant of 2x2 matrix

3. You have store a record of students in a file record.txt.

To make a file:
Make a function to write in a file i-e write_data().Each record contains the student's name, and there marks in Maths, Physics and Chemistry out of 100(make sure the user is not allowed to enter marks greater than 100). The marks can be floating values. The user enters names and marks for students. You are required to save the record in a record.txt.

Once you are done with the making file. Make a function read_data(d) that takes empty dictionary as a parameter Read the data from record.txt and add it into dictionary as a name and percentage (percentage =sum of total marks all three subjects /300 *100)
The user then enters a student's name. Output the name, average percentage marks obtained by that student, correct to two decimal places and on the basis of marks display grades as well.

Weighted final score	Final grade
80 <= mark <= 100	A
70 <= mark < 80	B
60 <= mark < 70	C
50 <= mark < 60	D
mark < 50	E

4. (Baseball Team Performance)

Create the design for a program that keeps track of the hits, walks, and outs of a baseball team. Use **lists** to keep track of each player's statistics. The player number is the index of the list. Read the data from the file which contains data that includes the player number, hits, walks, and outs.

1. write a function that read the data from the file baseball.txt and store it in list

baseball.txt

Player	Hits	Walks	Outs	At Bats
1	4	4	4	12
2	3	12	15	30
3	6	8	10	24
4	5	5	8	18
5	2	2	2	6
6	6	0	0	6
7	0	0	6	6
8	6	10	2	18
9	6	4	2	12
10	6	6	6	18
11	14	2	2	18
12	0	0	0	0
13	8	1	3	12
14	2	4	6	12
15	0	0	0	0
16	0	0	0	0
17	4	2	6	12
18	9	8	1	18
19	3	2	1	6
20	0	10	14	24

2. write a function that find the player number with the highest Hits **(you are not allowed to use built-in functions)**

3. write a function that find the player number with the highest Walks **(you are not allowed to use built-in functions)**
4. write a function that find the player number with the highest **Outs (you are not allowed to use built-in functions)**
5. write a function that find the player number with the highest At bats **(you are not allowed to use built-in functions)**
6. write a function that will write and also print the player numbers who have highest hits, walks, Outs and At bats in a performance.txt

   performance.txt will be like this:

```
Player 11 had the most hits
Player 2 had the most walks
Player 2 had the most outs
Player 2 had the most at bats
```

For Submission

1. Create a .py file for each question and copy your code in it. Name the file with relevant question number.
2. Copy all .py files in a folder.
3. **Rename** your folder name as rollumber_Name_section e.g **p176001_Abc_SectionITC.docx**
4. You also need to submit a screenshot of your answer's output. Save the screenshot within the same folder you created in step 2 and rename it with the relevant question number.