Programming Fundamentals LAB – BSDSF23
(Both Morning and Afternoon)
Lab 13 – 12-12-2023

Note: YOU may USE Command Prompt or *Mu Editor* to interpret and execute all the PYTHON programs. Use of any IDE, except *Mu Editor* is not allowed for this LAB, despite you are expert. Unless and until you convinced me of it personally.

Also note, if the computer systems are not equipped with python interpreter, you may use online compiler at the following URL highlighted in yellow. And in case it is also difficult to use for any reason, you need to do the paperwork within the LAB time for all tasks, as discussed in the class sessions. Thanks

https://www.programiz.com/python-programming/online-compiler/

Tasks set 1 (20 each)

1. Create and test a function describes as *def paddedStr(st, ln, ch, p)*. Here the *st* is string to be padded in total length *ln*, *ch* is the padding character as string, and *p* is the placement of *st* in the padded string. The possibilities of *p* are 'l'. 'r', and 'c' for the left, right and center placements respectively.

2. Create and test a function describes as *def runLengthEncode(st)*. The function takes a string parameter *st* and logically computes and prints the run length data as: it scans string *st* from 0th index to the last and prints a character in the string with its consecutive occurrences, followed by the same treatment up to the last character, termed as run length. E.g., if the parameter is as follows:

    aaaaabbbcaaaaaaaabbbbbbbbbbbbbbbbbbbbbbbbbbbbbbkk kkkkkkkkkkk.

The output of the function should be:

    a:5b:3c:1a:8b:30kkk:3 :1k:12.:1

3. Create and test a function describes as *def checkerBoard(size)*. The function takes an integer parameter *size* which must be one from the following perfect squares, 16, 25, 36, 49, 64, 81, 100, ..., and logically computes and prints the checker board. E.g., if sizes are 16 and 49, the following are the outputs.

Size	16	49
Checker Board	0000444400004444 0000444400004444 0000444400004444 0000444400004444 4444000044440000 4444000044440000 4444000044440000 4444000044440000 0000444400004444 0000444400004444 0000444400004444 0000444400004444 4444000044440000 4444000044440000 4444000044440000 4444000044440000	0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 7777777000000077777770000000777777700000007777777 7777777000000077777770000000777777700000007777777 7777777000000077777770000000777777700000007777777 7777777000000077777770000000777777700000007777777 7777777000000077777770000000777777700000007777777 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 7777777000000077777770000000777777700000007777777 7777777000000077777770000000777777700000007777777 7777777000000077777770000000777777700000007777777 7777777000000077777770000000777777700000007777777 7777777000000077777770000000777777700000007777777 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 7777777000000077777770000000777777700000007777777 7777777000000077777770000000777777700000007777777 7777777000000077777770000000777777700000007777777 7777777000000077777770000000777777700000007777777 7777777000000077777770000000777777700000007777777 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 7777777000000077777770000000777777700000007777777 7777777000000077777770000000777777700000007777777 7777777000000077777770000000777777700000007777777 7777777000000077777770000000777777700000007777777 7777777000000077777770000000777777700000007777777 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000 0000000777777700000007777777000000077777770000000

Tasks set 2 (20 each)

4. Write a program to create a file name ***contact.txt*** to save your contacts. The program takes your ***contact's name***, and his/her ***phone number*** and ***email address*** as input from user through keyboard and save the data in the file which in text editor looks like:

```
Bilawal Zaheer                  03990123456 bzhr@gmail.com
Akram Waseem                    03801122373 akramwaseem23@gmail.com
Abbu Jan                        03620723672 dearfather@live.com
Aapi                            03795554662 jahanur9@gmail.com
```

Note: white spaces in the file are just SPACE characters. You may use f-string or your own padding function created in task 1 to adjust the contact's name in a fixed number of characters.

Now, update the above program to save contacts in the following format.

```
Bilawal Zaheer,03990123456,bzhr@gmail.com
Akram Waseem,03801122373,akramwaseem23@gmail.com
Abbu Jan,03620723672,dearfather@live.com
Aapi,03795554662,jahanur9@gmail.com
```

5. Write a program to read a text file ***expenses.txt*** contains the expenses of the last 7 on 4 departments for an organization and generates the following output about the total weekly expense of each department.

Sale: 8000
IT: 5000
PRODUCTION: 40000
ADMIN: 6000

Note: Your program must take care of similar expenses of N departments, just not 4 as in above example. Add data for more departments in the text files through text editor and text your program again. One way is to ask the user about the number of departments in the file, before processing the data in the file.

Thanks, for your **patience**

If you got time, solve some pending tasks from previous labs