Week 4: Assignment 4
Generate Report Card for the Class

[*Last Updated on:* ***26th April, 2021, 16:00 Hrs***]

- Aim
- Given
- Procedure
  - `readMarkSheet()`
  - `generateGradeCard()`
- Expected Output
- Grading and Submission Instructions
- References

Aim

You are TA (Teaching Assistant) under a Professor in an academic institution. The end semester exams have been conducted for 5 subjects. Now the crucial task of gathering the data is to be done.

Professor has given you a CSV file with 6 columns, where the first column contains the name of student and the subsequent 5 columns contain the marks of that particular student gained in 5 subjects.

- Read the given CSV file and store the data in a Python dictionary. You need to then calculate the percentage of each student and give them a grade accordingly.

- The grades are to be given by following the below rule:

  - Percentage **equal to or above 90%** is given the grade **'O'**
  - Percentage **equal to or above 70%** is given the grade **'A'**
  - Percentage **equal to or above 60%** is given the grade **'B'**
  - Percentage **equal to or above 50%** is given the grade **'C'**
  - Percentage **equal to or above 40%** is given the grade **'D'**
  - Percentage **below 40%** is given the grade **'Fail'**

- Generate the Grade Card for all in the form of Python dictionary in the following manner:

```
{
    'name_of_the_student': {
        'subject_wise_marks': [subject1_marks, subject2_marks, subject3_marks,
                               subject4_marks, subject5_marks],
        'grade_received': 'A'
    }
}
```

- The skeleton code stub provided is to be used. It calls the functions `readMarkSheet()` and `generateGradeCard()` . Your task is to modify and complete these functions.

Given

Two files are provided to solve this assigment.

- Skeleton program file: `assignment4.py`
    - The skeleton consists of three functions which you have to modify:
        - `readMarkSheet()`
        - `generateGradeCard()`
- Sample CSV file: `week4_assignment4_sample.csv`
    - The CSV file has 6 columns: `name` , `subject_1` , `subject_2` , `subject_3` , `subject_4` and `subject_5` .

Procedure

- Open the skeleton program file, `assignment4.py` .

- You will notice pre-written comments included in skeleton program for your assistance to solve the assignment.

- Two functions to modify are:

    - ### `readMarkSheet()`

Function Name	`readMarkSheet()`
Purpose	Reads the input CSV file of Mark Sheet and creates a mapping of student name with his/her marks for each subject.
Input Arguments	`file_name` : [***str***] CSV file name of Mark Sheet
Output Arguments	`name_marks_mapping` : [***dict***] Mapping of each student's name and his/her marks for each subject as { Key : Value } pair
Example Call	***name_marks_mapping = readMarkSheet(csv_file_name)***

    - ### `generateGradeCard()`

Function Name	`generateGradeCard()`
Purpose	Generate the Grade Card for all students in the given mapping of student and their scores in all subjects with the grade each one has received.
Input Arguments	`mapping_dict` : [***dict***] Mapping of each student's name and his/her marks for each subject as { Key : Value } pair
Output Arguments	`grade_card` : [***dict***] Grade Card for all students with their scores in all subjects and the grade each one has received
Example Call	***grade_card = generateGradeCard(name_marks_mapping)***

- To run and debug your solution, type the below command in Terminal:

```
$ python3 assignment4.py
```

This command will run the shell script `assignment4.py` .

- Refer the **Expected Output** section below and debug your code to get the correct output.

Expected Output

- The provided sample CSV file, `week4_assignment4_sample.csv` consists data with fields ***name***, ***subject_1***, ***subject_2***, ***subject_3***, ***subject_4*** and ***subject_5***.
- The content of this CSV file is shown below:

```
name,subject_1,subject_2,subject_3,subject_4,subject_5
Artus Syne,43,71,55,16,51
Evey Reburn,49,7,53,50,63
Giff Wickmann,63,37,21,87,9
Garrot Casetta,22,3,91,75,52
Roselle Maes,71,90,96,79,48
Torin Ziehms,71,31,83,1,25
Jaye Etock,92,9,2,78,55
Thomasina Tinkham,25,78,46,46,90
Adolphus Biernat,91,96,98,94,100
Rex Aspinell,34,75,51,38,99
```

- The expected output of program `assignment4.py` i.e., to generate the Grade Card for each student is shown below:

```
{
    'Artus Syne': {'marks': [43.0, 71.0, 55.0, 16.0, 51.0]},
    'Evey Reburn': {'marks': [49.0, 7.0, 53.0, 50.0, 63.0]},
    'Giff Wickmann': {'marks': [63.0, 37.0, 21.0, 87.0, 9.0]},
    'Garrot Casetta': {'marks': [22.0, 3.0, 91.0, 75.0, 52.0]},
    'Roselle Maes': {'marks': [71.0, 90.0, 96.0, 79.0, 48.0]},
    'Torin Ziehms': {'marks': [71.0, 31.0, 83.0, 1.0, 25.0]},
    'Jaye Etock': {'marks': [92.0, 9.0, 2.0, 78.0, 55.0]},
    'Thomasina Tinkham': {'marks': [25.0, 78.0, 46.0, 46.0, 90.0]},
    'Adolphus Biernat': {'marks': [91.0, 96.0, 98.0, 94.0, 100.0]},
    'Rex Aspinell': {'marks': [34.0, 75.0, 51.0, 38.0, 99.0]}
}
{
    'Artus Syne': {'subject_wise_marks': [43.0, 71.0, 55.0, 16.0, 51.0], 'grade_rece
    'Evey Reburn': {'subject_wise_marks': [49.0, 7.0, 53.0, 50.0, 63.0], 'grade_rece
    'Giff Wickmann': {'subject_wise_marks': [63.0, 37.0, 21.0, 87.0, 9.0], 'grade_re
    'Garrot Casetta': {'subject_wise_marks': [22.0, 3.0, 91.0, 75.0, 52.0], 'grade_r
    'Roselle Maes': {'subject_wise_marks': [71.0, 90.0, 96.0, 79.0, 48.0], 'grade_re
    'Torin Ziehms': {'subject_wise_marks': [71.0, 31.0, 83.0, 1.0, 25.0], 'grade_rec
    'Jaye Etock': {'subject_wise_marks': [92.0, 9.0, 2.0, 78.0, 55.0], 'grade_receiv
    'Thomasina Tinkham': {'subject_wise_marks': [25.0, 78.0, 46.0, 46.0, 90.0], 'gra
    'Adolphus Biernat': {'subject_wise_marks': [91.0, 96.0, 98.0, 94.0, 100.0], 'gra
    'Rex Aspinell': {'subject_wise_marks': [34.0, 75.0, 51.0, 38.0, 99.0], 'grade_re
}
```

- The first twelve lines above are the output of `readMarkSheet` function i.e. variable `name_marks_mapping` and,

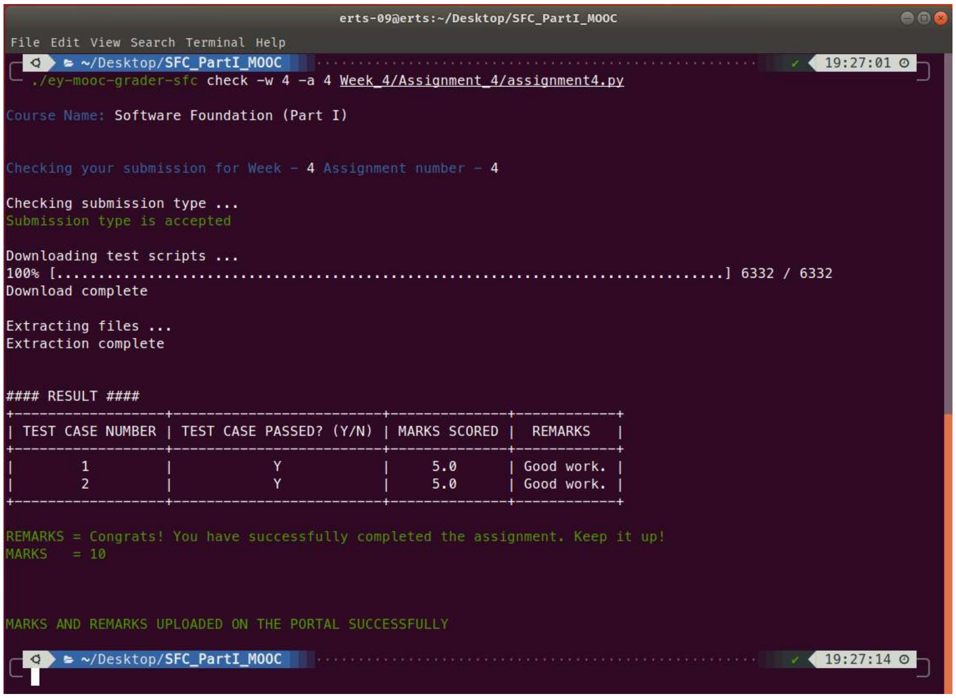
  the lines 13 to 24 are the output of `generateGradeCard` function i.e. variable `grade_card` .

Grading and Submission Instructions

- Navigate to the folder where the ***ey-mooc-grader-sfc*** application resides.
- To grade your solution, run the **`check`** command of the application as follows:

```
$ ./ey-mooc-grader-sfc check -w 4 -a 4 Week_4/Assignment_4/assignment4.py
```

- This will run your program **`assignment4.py`** against random test cases and grade it. Marks and appropriate remarks will be provided as shown in Figure 1.
- Your program file **`assignment4.py`** , marks scored and remarks will get uploaded to the MOOC portal.



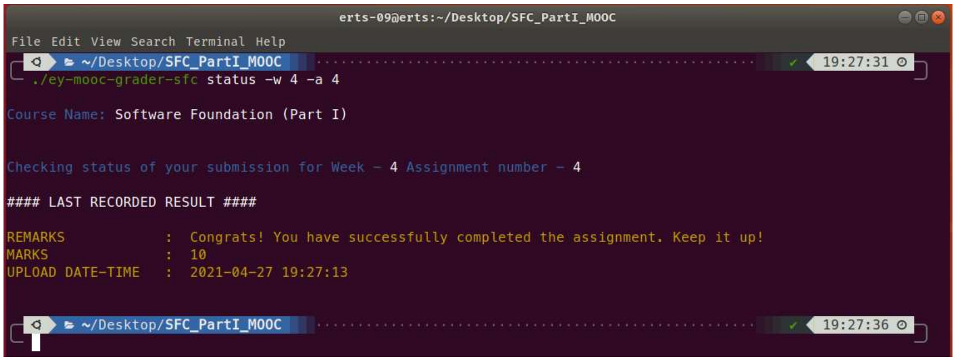
erts-09@erts:~/Desktop/SFC_PartI_MOOC
File Edit View Search Terminal Help

```
 ~/Desktop/SFC_PartI_MOOC                                        ✓ 19:27:01
  ./ey-mooc-grader-sfc check -w 4 -a 4 Week_4/Assignment_4/assignment4.py

Course Name: Software Foundation (Part I)


Checking your submission for Week - 4 Assignment number - 4

Checking submission type ...
Submission type is accepted

Downloading test scripts ...
100% [..........................................................................] 6332 / 6332
Download complete

Extracting files ...
Extraction complete


#### RESULT ####
+------------------+--------------------------+--------------+------------+
| TEST CASE NUMBER | TEST CASE PASSED? (Y/N) | MARKS SCORED |  REMARKS   |
+------------------+--------------------------+--------------+------------+
|        1         |            Y            |     5.0      | Good work. |
|        2         |            Y            |     5.0      | Good work. |
+------------------+--------------------------+--------------+------------+

REMARKS = Congrats! You have successfully completed the assignment. Keep it up!
MARKS   = 10



MARKS AND REMARKS UPLOADED ON THE PORTAL SUCCESSFULLY

 ~/Desktop/SFC_PartI_MOOC                                        ✓ 19:27:14
```

Figure 1: Output of running check command for Week 4 Assignment 4

- You can verify this by running the **`status`** command of the application as given below, refer Figure 2.

```
$ ./ey-mooc-grader-sfc status -w 4 -a 4
```



erts-09@erts:~/Desktop/SFC_PartI_MOOC
File Edit View Search Terminal Help

```
 ~/Desktop/SFC_PartI_MOOC                                        ✓ 19:27:31
  ./ey-mooc-grader-sfc status -w 4 -a 4

Course Name: Software Foundation (Part I)


Checking status of your submission for Week - 4 Assignment number - 4

#### LAST RECORDED RESULT ####

REMARKS            :  Congrats! You have successfully completed the assignment. Keep it up!
MARKS              :  10
UPLOAD DATE-TIME   :  2021-04-27 19:27:13


 ~/Desktop/SFC_PartI_MOOC                                        ✓ 19:27:36
```

Figure 2: Output of running status command for Week 4 Assignment 4

References

- Official Python documentation of CSV module
- Blog on Python CSV Module by RealPython

- Blog on For Loops by RealPython
- Blog on Python Dictionary by Programiz
- Blog on Python Dictionary by RealPython
- Blog on Python Tuples by RealPython

All The Best!