01.01.2016

CENG 113
Programming Basics
HOMEWORK #9

Write a python code. Please adapt your code scenario given below.

- 'student_grades.txt' file contains student names and their midterm1 exam grades, midterm2 exam grades, final exam grades and four homework grades in a format given below.

  student_grades.txt

  ```
  student_name: midterm1 midterm2; final; hw1 hw2 hw3 hw4 hw5
  .
  .
  .
  ```

- You should read student names and grades from file and then calculate their averages by using below weights.
  - Weight of midterm1 is 20%.
  - Weight of midterm2 is 20%.
  - Weight of final is 40%.
  - Weight of homework1 is 5%.
  - Weight of homework2 is 5%.
  - Weight of homework3 is 5%.
  - Weight of homework4 is 5%.

- After calculating their average grades. According to their grade averages, find letter grades for each student by using below rules.
  - 100 - 90 AA
  - 89 - 85 BA
  - 84 - 80 BB
  - 79 - 75 CB
  - 74 - 70 CC
  - 69 - 65 DC
  - 64 - 60 DD
  - 59 - 50 FD
  - 49 - 0 FF
- After finding letter grades, you should sort students by their average grades. Then you should write back **SORTED** list to the same file **ONLY STUDENT NAMES, AVERAGE GRADES AND LETTER GRADES** in a format given below.

  student_grades.txt

  ```
  student_name: average grade; letter grade
  .
  .
  .
  ```

In this homework you are expected to write at least 5 functions. The functions jobs are given below.

Function #1: Your first function is responsible for **reading** student names and grades from file.

Function #2: This function is responsible for **calculating average grades** with previously defined weights. It must be implemented in a **RECURSIVE** way.

Function #3: Your third function is responsible for **finding letter grades** with previously defined rules. It must be implemented in a **RECURSIVE** way.

Function #4: This function is responsible for **sorting students** by considering **ONLY AVERAGE GRADES.** It must be implemented in a **RECURSIVE** way.

Function #5: This function is responsible for **WRITING** **sorted students** with their names, their average grades and letter grades to the 'student_grades.txt' .

HINT: For Function 4, you can use more than one RECURSIVE functions.

Example:

Content of 'student_grades.txt' **before running.**

```
Adam: 2.5 45; 24; 76 79 80 13
Charles: 91 33; 86; 29.5 78 56
62
David: 93 50; 80; 43 95 10.5 86
John: 63 92; 74; 72.5 84 87 58
Leo: 7 100; 48; 80 86 56 32
Peter: 90 92; 79; 94 86 90 89
Susan: 73 64; 70; 8 95 19 30
.
.
.
```

Content of 'student_grades.txt' **after running**

```
Peter: 85.95; BA
John: 75.675; CB
David: 72.325; CC
Charles: 70.475; CC
Susan: 63.0; DD
Leo: 53.3; FD
Adam: 31.5; FF
.
.
.
```

Due Date:06.01.16, 23:55

Submission Rules:

1. You should submit your codes through CMS.
2. Your homework should be named as **HW9_StudentID.py.** Students who do NOT follow these rules **WILL BE GRADED AS 0.**
3. Use comments in your code, otherwise you will lose some points.
4. Write your Name, Surname and Student ID as a comment in your code.