



Department of Computer Science and Engineering PES
University, Bangalore, India
Python for Computational Problem Solving - UE24CS151A

Problem Statement: Level-1 (Banana)

Prepared by:

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Date: 8th November, 2024
Timing: 1:45 PM to 4:00 PM

Problem Statement: Student Course Enrollment

Given the details of student course enrollment in a file containing four columns – Student Name, Course Name, Grade, and Score find the solution for the following questions:

1. Find the total number of students enrolled and unique courses offered.
2. Display the list of students enrolled in each course.
3. For each student, count and list the courses they have enrolled in.
4. Determine the average score for each course.
5. Add two new student enrollments to the existing data with all required details.
 - a) Jack, Physics, A-, 90
 - b) Jill, Biology, B+, 89
6. Remove all entries of a specified student from the dataset.

Percentage	Letter Grade
98-100	A+
93-97	A
90-92	A-
87-89	B+
83-86	B
80-82	B-
77-79	C+
73-76	C
70-72	C-
67-69	D+
63-66	D

60-62	D-
<60	F

Optional tasks:

7. For each course, determine the maximum score among all the students.
8. Find the average score of each student across all courses.

Dataset 2: Student Course Enrollment (enrollments.txt)

```
Alice, Mathematics, A, 95
Bob, Mathematics, B, 84
Alice, Physics, A-, 91
Charlie, Biology, B+, 88
Alice, Chemistry, A, 94
Bob, Physics, B+, 87
Charlie, Mathematics, A-, 90
David, Mathematics, C+, 77
David, Physics, B-, 80
Eve, Biology, A, 96
```

Methodology:

Load the Dataset- Load the dataset from a file into a variable for easier manipulation.

Data Exploration- Explore the dataset.

Detailed Analysis- Make sure you know the significance of each column and a row in a given dataset.

Implementation:

- Language: Python 3.10 or above.
- Use data structures such as lists, sets and dicts to store and organize the data.
- Use/write appropriate functions- Specific to Data structures and also user defined functions for each functionality.
- Make use of operators, loops and conditionals

Expected Output for all sub-problems:

Menu:

1. Find the total number of students enrolled and unique courses offered
2. Display the list of students enrolled in each course
3. For each student, count and list the courses they have enrolled in
4. Determine the average score for each course
5. Add new student enrollment to the existing data with all required details
6. Remove all entries of a specified student from the dataset

7. For each course, determine the maximum score among all students
8. Find the average score of each student across all courses
9. Exit

Subproblem1

Enter your choice: 1
Total number of students: 5
Unique courses: {'Physics', 'Biology', 'Chemistry', 'Mathematics'}

Subproblem2

Enter your choice: 2
Students enrolled in Mathematics course
 Alice
 Bob
 Charlie
 David
Students enrolled in Biology course
 Charlie
 Eve
Students enrolled in Physics course
 Alice
 Bob
 David
Students enrolled in Chemistry course
 Alice

Subproblem3

Enter your choice: 3
Student: Alice
Total number of courses: 3
List of courses taken:
['Mathematics', 'Physics', 'Chemistry']
Student: Bob
Total number of courses: 2
List of courses taken:
['Mathematics', 'Physics']
Student: Charlie
Total number of courses: 2
List of courses taken:

```
['Biology', 'Mathematics']  
Student: David  
Total number of courses: 2  
List of courses taken:  
['Mathematics', 'Physics']  
Student: Eve  
Total number of courses: 1  
List of courses taken:  
['Biology']
```

Subproblem4

```
Enter your choice: 4  
Average score in Mathematics course is: 86.50  
Average score in Biology course is: 92.00  
Average score in Physics course is: 86.00  
Average score in Chemistry course is: 94.00
```

Subproblem5

```
Enter your choice: 5  
Enter student name: Jill  
Enter course name: Mathematics  
Enter the grade: A-  
Enter the score: 91  
['Jill', 'Mathematics', 'A-', '91'] Student entry added successfully.
```

Open enrollments.txt to check the new added entry:

```
Alice, Mathematics, A, 95  
Bob, Mathematics, B, 84  
Alice, Physics, A-, 91  
Charlie, Biology, B+, 88  
Alice, Chemistry, A, 94  
Bob, Physics, B+, 87  
Charlie, Mathematics, A-, 90  
David, Mathematics, C+, 77  
David, Physics, B-, 80  
Eve, Biology, A, 96  
Jill, Mathematics, A-, 91
```

Subproblem6

```
Enter your choice: 6  
Enter the student name: bob  
All student entries by 'bob' have been removed successfully.
```

Open enrollments.txt to check the deleted entry:

```
Alice, Mathematics, A, 95
Alice, Physics, A-, 91
Charlie, Biology, B+, 88
Alice, Chemistry, A, 94
Charlie, Mathematics, A-, 90
David, Mathematics, C+, 77
David, Physics, B-, 80
Eve, Biology, A, 96
Jill, Mathematics, A-, 91
```

Subproblem7

Enter your choice: 7

Max score in the Mathematics is 95.00

Max score in the Biology is 96.00

Max score in the Physics is 91.00

Max score in the Chemistry is 94.00

Subproblem8

Enter your choice: 8

Average score of Alice is: 93.33

Average score of Charlie is: 89.00

Average score of Jill is: 91.00

Average score of David is: 78.50

Average score of Eve is: 96.00

Enter your choice: 9

Process finished with exit code 0

Submission Mode:

Link is shared by Faculty members for a set of students in each venue. Choose the correct section you belong to in the current semester.

-END-