

Day 24 In-Class Coding Exercise

Today you will be working on a coding exercise in which the development of one or more functions would be very beneficial.

Download the Excel spreadsheet named `grade_for_functions.xlsx` from the course web page.

It contains a large grade sheet for a freshman course. The number of columns on the spreadsheet is known, but the number of students (the number of rows in the spreadsheet) may vary. (Use MATLAB to determine the size of the sheet – do not hard code the information in the program.) The columns in the grade sheet can be summarized by the following table:

Column Number	Contents
1	Student ID number
2 – 10	Homework scores (percentage)
11 – 14	Exam scores (percentage)

According to the course policy, the total course grade is computed based on the following formula:

$$\text{Total course score} = 0.20 \times \text{Homework Average} + 0.80 \times \text{Exam Average}$$

where “average” represents the arithmetic mean of all reported scores in the respective category.

Write a MATLAB code to do the following:

- a) Read in the data stored in the Excel spreadsheet. Determine the total number of students recorded on the data sheet and print it to a file using the following format:

```
The total number of students in the course is xxxxx.
```

- b) Do not hard code your result for Part a) anywhere in your code. Write a function to compute the total course score for each student. The function call in the main code should be

```
student_scores = score_function(grade_sheet)
```

where `student_scores` is a single vector containing one (total course score) value for each student and `grade_sheet` is the array containing the spreadsheet data. To show that your function is working correctly, have the main program print the total course score for just the first student to the file (the same file as for part a) using the following format:

```
The total course score for the first student is xxx percent.
```

(over)

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- c) Based on the total course score computed in Part b), we wish to assign a grade to each student according to the following scheme:

Total Course Score x	Grade
$90\% \leq x \leq 100\%$	A
$80\% \leq x < 90\%$	B
$70\% \leq x < 80\%$	C
$60\% \leq x < 70\%$	D
$x < 60\%$	F

Write a function to assign a grade to each student and count the total number of students who received each letter grade. The function call in the main code should be

```
grade_count = grade_count_function(student_scores)
```

where `grade_count` is a column vector containing the number of students receiving A's, B's, C's, D's, and F's, and `student_scores` is the vector from Part b).

In the main script, print the number of students receiving each grade to the file (the same file as before) using the following format:

```
    A    B    C    D    F
  XXX  XXX  XXX  XXX  XXX
```