

Preparation for In-class Coding Assignment 3 Scheduled for Week 11

Practice Coding Assignment

MarkBook Application

The following program allows a professor (the user) to get statistics about his/her class grades. The program can take in students' data for a class size up to 100 students. The program is a prototype and contains placeholders for students' names.

1. Prompt the professor to enter a class size, which will be an integer between 1 and 100. Validate that the input is within the range and allow the user to re-enter. **Do not validate the input type.**

2. Declare constants to store three test marks' values:

- Test 1 marks are out of 50
- Test 2 marks are out of 33
- Test 3 marks are out of 45

3. Create multiple arrays that can operate synchronously, where each array has a length of the class size. Populate each array as described below:

- **A student names array**
 - Populate the student names array with generic student names, which act as placeholder names
- **Three test marks arrays**
 - Populate each marks arrays with random marks between a 1 and the test score (see tests' values above)
- **An averages array**
 - Populate the averages array by calculating each test mark as a percentage, then finding the average of the three percentages
 - To find a test mark as a percentage:
 - $\text{Test1_Mark} * 100 / \text{Test1_Out_of_Value}$

See Sample Debugger View shown opposite.

4. Print the averages array (see sample output next page).

5. Next, calculate some statistics about the students' results, using the averages array. Print the statistics (see sample output next page):

- Class average
- Highest average (both the student's name and the average)
- Lowest average (both the student's name and the average)
- Class median

6. The application should generate an automated email to the students who have a failing average, that is, any grade below 49.5% (see sample output next page).

7. The application should generate a warning message to the professor, if the count of failing students is greater than half the class (see sample output next page).

Figure 1 – Sample Debugger View

>	input	Scanner (id=22)
⌚	TEST_ONE_VALUE	50
⌚	TEST_TWO_VALUE	33
⌚	TEST_THREE_VALUE	45
⌚	size	3
>	names	String[3] (id=28)
▼	marks1	(id=29)
▲	[0]	39
▲	[1]	8
▲	[2]	21
▼	marks2	(id=30)
▲	[0]	7
▲	[1]	29
▲	[2]	15
▼	marks3	(id=31)
▲	[0]	20
▲	[1]	10
▲	[2]	36
▼	averages	(id=32)
▲	[0]	47.88552188552188
▲	[1]	42.033670033670035
▲	[2]	55.81818181818181
⌚	sum	145.73737373737373
⌚	classAverage	48.579124579124574
⌚	max	55.81818181818181
⌚	min	42.033670033670035
⌚	maxIndex	2
⌚	minIndex	1
>	copy	(id=33)
⌚	median	47.88552188552188

Sample Output 1

```
***** Welcome to the MarkBook Application ****
Enter a class size (1-100): 10
-----
Student Name    Average
-----
Student 1       23.41
Student 2       66.40
Student 3       42.66
Student 4       34.33
Student 5       37.47
Student 6       55.04
Student 7       49.64
Student 8       47.68
Student 9        6.96
Student 10      58.68
-----
Class Averages Statistics
-----
Class Average:           42.23
Highest is Student 2:    66.40
Lowest is Student 9:     6.96
Class Median:           45.17
-----
Student 1 you have a failing average of 23.41. See your professor.
Student 3 you have a failing average of 42.66. See your professor.
Student 4 you have a failing average of 34.33. See your professor.
Student 5 you have a failing average of 37.47. See your professor.
Student 8 you have a failing average of 47.68. See your professor.
Student 9 you have a failing average of 6.96. See your professor.
-----
Warning professor: 6 of 10 students have a failing average
```

Sample Output 2

```
***** Welcome to the MarkBook Application ****
Enter a class size (1-100): 0
Error, enter a size between 1-100: 101
Error, enter a size between 1-100: 8
-----
Student Name    Average
-----
Student 1       51.62
Student 2       35.85
Student 3       51.61
Student 4       67.47
Student 5       37.16
Student 6       44.12
Student 7       20.91
Student 8       75.05
-----
Class Averages Statistics
-----
Class Average:           47.97
Highest is Student 8:    75.05
Lowest is Student 7:     20.91
Class Median:           47.87
-----
Student 2 you have a failing average of 35.85. See your professor.
Student 5 you have a failing average of 37.16. See your professor.
Student 6 you have a failing average of 44.12. See your professor.
Student 7 you have a failing average of 20.91. See your professor.
```