Topic: 2D array and Strings

Question 1

Marks scored by ten students in two tests and UE for a certain course at CoICT is given in `Table Q1`. All marks are out of 100. Test 1 and Test2 contributes 40% to CA and UE contributes 60%. Weight of Test 1 is 15% and Weight of test 2 is 25% of CA. finalMark=0.4*CA+0.6*UE where CA and UE each is out of 100%.

Table Q1

Std#	Test1	Test2	UE	finalMark	Grade
1	23	47.5	55		
2	56.5	72.5	68		
3	66.5	77.5	88.5		
4	87.5	43	25.5		
5	67.5	45	43.5		
6	78	89	87.5		
7	45	56	77		
8	23	24	32		
9	45	67	89		
10	12	56	65.5		

To save you time from typing the marks, the above marks are stored in the 2D array called **scores** in the following format:

```
double[][]={{23,   47.5, 55},
          {56.5, 72.5, 68},
          {66.5, 77.5, 88.5},
          ………………..
          {12,   56,   65.5}};
```

Where ….. have to be filled with the marks from the Table Q1.

Write a menu driven driven program (using a single class) to perform following services:
1. Display the marks of all students and corresponding finalMark and Grade(A, B+, B, etc) for each student in Tabular form as shown in Table Q1.
2. Display the CA (out of 40%) and UE (out of 60%) and corresponding finalMark (out of 100) for all students as shown in Table below:

Std#	CA	UE	finalMark
1			
2			
…	..	..	…
10			

   From the display check (by eyes) if CA+UE=finalMark (note in this case CA is out of 40% and UE is out of 60%. Display values for CA, UE and finalMark to 2 decimal places
3. Calculate and display the average for CA, UE and finalMark (out of 100%)
4. Calculate and display Statistical summary of the grades (using finalMark) as follows (Using UDSM grading system):

Grade	No. of students
A	X
B+	X
..	…
E	X

5. Display number of students failed and how many passed. Countercheck if the sum of passed and failed totals to 10.
6. Terminate the program.

Note: Each service (except number 6) should be serviced by a method. Use following method names for services (1-5) respectively**: dispAllData, dispCAUEfinalMark, dispAverages, statSummary** and **passedFailed**.

Question 2

Write a program which will prompt the user to enter his three names (surname middle name and first name) in that order and store it into a variable **fullName**. Make sure fullName contains three names (remember to trim leading and trailing blanks using **trim** method) and also characters entered must be letters only (no digits are allowed). If it does not meet these conditions, then an error message should be displayed and the user should re-enter the fullName.
Make sure that a single space separates the surname and middlename also middlename and firstname.

Using fullName variable, display the name using surname and initials of middle name and first name. That means , if the names entered are **Jumanne Hassan John** then display should be: **Jumanne, H.J.   Note: Use only one class**

Question 3

Write a program which is menu driven and **uses only one class** to perform the following services:
   1. Enter a sentence
   2. Display entered sentence in reverse order
   3. Display words from a sentence (one word per line) and total number of words in a sentence
   4. Count the number of vowels in a sentence and display the total number
   5. Display sentence in capital letters and in small letters
   6. Terminate the program.

Note: After entering a sentence **trim** it to remove leading and trailing blanks using **trim** method. **Each service (except service 6 should be handled by a method).** If the user chooses option 2-5 before option 1 then method for option 1 should be called automatically. Vowels means a, e, i, o, u (either small letters or capital letters). Option number 5 should not affect the original sentence. **Hint**: Options 2 up to 5 will be receiving entered sentence as a parameter in the method's header.
Use following Sample sentence to test your program:

```
CS175 Programming in Java
```

==END==