

Shiv Nadar Institution of Eminence, Delhi, NCR

Lab sheet for CSD101 (Introduction to computing and Programming)

Semester of Implementation: Monsoon, 2024

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Instructions:

1. Once you complete the assignment, please show it to the TA.
2. Students must come to the lab and must show the assignments in the designated lab hours. Day-to-day lab performances will be recorded and will carry 15% weightage in internal assessment.
3. Lab will start in exact time. Students should enter the lab and take a seat 5 minutes before.
4. It is recommended to use LINUX platform for execution of the program.
5. Batch change to show the assignments WILL NOT be allowed.
6. Malpractice (in ANY form) will attract heavy penalties.
7. A useful link: <https://www.w3schools.com/c/index.php>

Lab Assignment 6

Deadline: 06-10-2024 (11:55 PM) for Monday batch

06-10-2024 (11:55 PM) for Wednesday batch

06-10-2024 (11:55 PM) for Thursday batch

06-10-2024 (11:55 PM) for Friday batch

Total Marks: 100

Objective: Programs based on Arrays

Steps to run C program

Step 1: gedit filename.c

Step 2: Compiling using GCC compiler

We use the following command in the terminal for compiling our filename.c source file

```
$ gcc filename.c -o filename
```

Step 3: Executing the program

After compilation executable is generated and we run the generated executable using the below command.

```
$ ./filename
```

Q1. Previously you computed BMI for all the students in the class using a loop. However, now you must not only compute the BMI's but also store them. Such that later you can print the BMI of i -th student as and when requested. To this end, write a program which takes as input the number of students n in the class [assume that $n \leq 100$]. Input the height (in meters) and weight (in kilograms) of each student in two different arrays. Compute each student's BMI and store it in a third array.

[a] Enter the student number i as an input and print their height, weight, BMI-value, and BMI-category respectively, wherein $BMI = \left(\frac{weight}{height^2}\right)$.

Use the following table for categorization.

Category	BMI range - kg/m ²
Mild Thinness	17 - 18.5
Normal	18.5 - 25
Overweight	> 25

If none of the condition matched, then print "Inhuman Status".

Input and Output

Enter the number of students in class: 4 //Input

Enter details for student 1 //Input

Weight: 35 //Input

Height: 1.45 //Input

Enter details for student 2 //Input

Weight: 70 //Input

Height: 2 //Input

Enter details for student 3 //Input

Weight: 90 //Input

Height: 2 //Input

Enter details for student 4 //Input

Weight: 79 //Input

Height: 1.8 //Input

You would like to see the details for which student: 2

Weight: 70 Height: 2 BMI-value: 17.5 BMI-category: Mild Thinness //Output

[b] Extend the above program so that it prints the details (of weight, height, BMI-value, and BMI-categorization) for those students where the BMI-category is “Normal”.

Output:

Student 3 BMI is normal, and the details are as follows:

Weight: 90 Height: 2 BMI-value: 22.5

Student 4 BMI is normal, and the details are as follows:

Weight: 79 Height: 1.8 BMI-value: 17.5

Q2. The class quiz for all your courses is over and now you would like to analyse your scores.

[a] Write a program that takes as input your scores for 7 courses and stores them in an array. It should then output your “highest” and “lowest” scores respectively, and your final grade based on the average score. The grading system is as follows:

- A: Average score ≥ 85
- B: Average score ≥ 75 and < 85
- C: Average score ≥ 65 and < 75
- D: Average score ≥ 50 and < 65
- E: Average score ≥ 30 and < 50
- F: Average score < 30

Input

Marks for course 1: 70
Marks for course 2: 80
Marks for course 3: 55
Marks for course 4: 60
Marks for course 5: 85
Marks for course 6: 36
Marks for course 7: 59

Output

Your highest score is: 85
Your lowest score is: 36

Your average score is: 63.57
Your grade is: D

[b] Extend the above program so that it can also print the number of subjects for which the individual subject score is less than or equal to a threshold value.

Input

Enter the threshold value: 60

Output

Number of courses for which score is less than or equal to the threshold value is: 4

Complementary Assignment for self-practice

Q3. You can further extend the previous question to do the following,

[a] Check if you have scored a particular number for any of the courses. If yes, print the subject number.

Input → The particular score which you are searching for: 36

Output → Yes, you have scored that in course 6

Input → The particular score which you are searching for: 43

Output → Nope, you have not scored that in any of the courses

[b] Create another array where you can similarly store scores for the next set of quiz. You know that only the best of the two quizzes would be counted for your final score. Write a program that stores the best of the two arrays in the third array and prints its values.

Input

Enter marks for quiz 1:

Marks for course 1: 70
Marks for course 2: 80
Marks for course 3: 55
Marks for course 4: 60
Marks for course 5: 85
Marks for course 6: 36
Marks for course 7: 59

Enter marks for quiz 2:

Marks for course 1: 65
Marks for course 2: 83
Marks for course 3: 64
Marks for course 4: 58
Marks for course 5: 82
Marks for course 6: 45
Marks for course 7: 71

Output

The best of the two quizzes is:

Marks for course 1: 70
Marks for course 2: 83

Marks for course 3: 64
Marks for course 4: 60
Marks for course 5: 85
Marks for course 6: 45
Marks for course 7: 71

Submission Format:- You have to upload: (1) The source code in the following format in a zipped folder: Assgn6_RollNo.zip. Inside the zipped folder save each program with Assgn6_task#_RollNo.c

Note: Please follow this naming convention mentioned above.

Grading Policy:- The policy for grading this assignment will be - (1) show to TA 66 marks
(2) Code submission with indentation: 34 marks.

- All submissions are subject to plagiarism checks. Any case of plagiarism will be dealt with severely.