

# Lab 2: Data types, operators, if else statements

*9:00 am to 12:00 pm*

**Total marks: 25**

## General instructions

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- No compensation or makeup lab
- Don't discuss with peers.
- Cheating cases will be given ZERO.
- You can ask only relevant queries from TAs between 9 am – 12pm.
- Submission must be done before ending time i.e. 12 pm. Even a few seconds late submission will be discarded

## submission protocol

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- Submit your file in a .zip or .rar format using the submission link that will be shared by TAs. Name your file with your Roll number (e.g. BCSF20M001.zip or BCSF20M001.rar)
- Make a separate folder for each lab task (e.g. task1, task2...). The.cpp files must be in respective folder with a screenshot of the output of a program of the respective task.
- The algorithm design task must be submitted in format (.docx or PDF or jpeg or PNG). This file must be added to your zipped submission as instructed in previous steps
- Every Cpp file must contain your name and roll number(In comments) at the top of each program
- Don't enclose your code in comments otherwise it will not be evaluated.

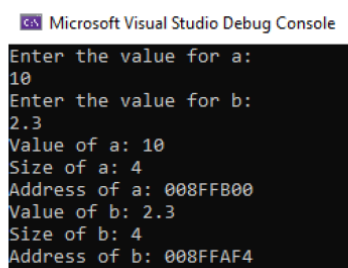
### Question 1:

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Write a program in c++ that do the following tasks:

1. Declare an integer variable named "a" and float variable named "b".
2. Take input from user in these declared variables.
3. Print the following for each variable
  - a. Its value
  - b. Size of variable (in bytes)
  - c. Its address (address of memory location allocated to that variable)

**Expected output:**



```
Microsoft Visual Studio Debug Console
Enter the value for a:
10
Enter the value for b:
2.3
Value of a: 10
Size of a: 4
Address of a: 008FFB00
Value of b: 2.3
Size of b: 4
Address of b: 008FFAF4
```

## Question 2:

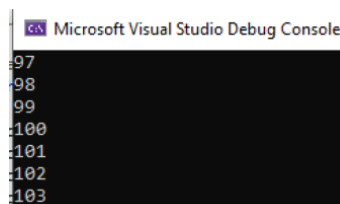
Write a program in c++ that do the following tasks:

1. Declare a character variable.
2. Initialize it with character 'a'.
3. Print the ASCIs of characters (a,b,c,d,e,f, and g) using series of cout statements, each for one character. You cout statement **should only have** variable c involved in it (with + operator obviously to make it handle ASCIs). You cannot explicitly specify any character. That is, you cannot use do the following:

`Cout<<'b'+0; //to print ASCII of 'b'` NOT ALLOWED

`Cout<<'b'+1 //to print ASCII of 'c'` NOT ALLOWED

**Expected output:**



```
Microsoft Visual Studio Debug Console
97
98
99
100
101
102
103
```

## Question 3:

Write a program in c++ that do the following tasks:

1. Declare character variable and take input in it from the user
2. Using *if*, *else if*, and *else* statements, find if the given character is a
  - a. Lower case alphabet i.e. if it lies inside a range 'a' to 'z'
  - b. Upper case alphabet i.e. if it lied inside a range 'A' to 'Z'
  - c. Any character, other than upper and lower case alphabets

Your if else structure would be like:

```
If( )//insert appropriate condition to check for lower case
{
    Display appropriate message
}
Else if( ) //insert appropriate condition to check for upper case
{
    Display appropriate message
}
Else //insert appropriate condition to check for "any other character"
{
    Display appropriate message
}
```

Inside range conditions, you might need to check the correctness of two possibilities. For example, for lower case alphabet you need to check two things:

1. If character is greater than equal to ASCII of character 'a'
2. If character is less than equals to ASCII of character 'z'

#### Question 4:

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Write a program that reads in five integers from user and determines and prints the largest and the smallest integers in the group using relational operators.

#### Question 5:

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Write a program that reads in two integers and determines and prints if the first is a multiple of the second. (Hint: Use the modulus operator. For multiple, one number must be divisible to the other number.). You might need to use simple *if else* statement to print if the number is a multiple or not.