National University of Computer and Emerging Sciences



Lab Manual

for

Programming Fundamentals

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# Lab Manual 03

# Introduction

## Objectives

In this lab we will mainly perform three types of activities

1. Understanding of basic header files, main() function, output of visual studio.
2. Variable Declaration and initialization.
3. Input and Output on console.

**Variable Declarations:**

A variable is declared as: type variable\_name

Examples:

**int** population;

**double** distance;

**string** my\_name;

Several variables can be declared together:

**int** age, children, cars;

**Expression**:

An expression is a combination of literals, variables, operators and functions that is evaluated

and returns a value.

**Examples**:

variable = a + 3(i - 1)

## Task 1

**Activity 1**

Write a C++ program that prints your name.

# Activity 2 (Calculate area of Rectangle)

Take two inputs from user (keyboard) length and breadth of rectangle. Compute the area of rectangle given by: area = length\*breadth

| **Step-1**: Create a console application. | **Open Visual studio and create a console application** |
| --- | --- |
| **Step-2**: Declare int variables length, breath and area. | int length; int breadth; int area; |
| **Step-3**: Print a message for user to input length. | cout << "Please enter length of rectangle: "; |
| **Step-4**: Take input from user/keyboard length. | cin >> length; |
| **Step-5**: Print a message for user to input breadth. | cout << "Please enter breadth of rectangle: "; |
| **Step-6**: Take input from user/keyboard breadth. | cin >> breadth; |
| **Step-7**: Calculate area according to formula by multiplying length and breadth, and store the result in “area” variable. | area = length \* breadth; |
| **Step-8**: Print appropriate message and area. | cout << "Area of rectangle is " << area; |

## Task 2:

Write a code to calculate the area of triangle, your code must declare and initialize the required variables and ask the user to enter base and height on console and then display the result on the Console window.

DECLARE and initialize Base, Height and Area

INPUT Height, Base

Calculate Area as Area = 0.5 \* Height \* Base

Print Area

## Task 3:

Write a program that inputs 4 numbers and calculates the sum, average and product of all the numbers.

Output:

Enter first number:1

Enter second number: 2

Enter the third number:5

Enter the fourth number: 7

Sum of all numbers: 15

product of all numbers: 70

Average of all numbers: 3

**Task 4:**

Take a character as input and display its ASCII value on screen.

## Task 5:

Write a program that gets a three-digit number from the user and displays it in reverse order. for example, if the user enters 123, it displays 321.

Output example:

Enter 3-digit number:512

Number in reverse order:215

## Task 6:

Write a C++ program that takes two integers as input, stores these in two different variables and

then

swap the values of these two variables.

Input: a=5 b=10

Output: a=10 b=5

Hint: Use an additional variable.

## Bonus Task:

Solve problem 6 without using an additional variable for swap.