

### **LAB EXERCISE 3**

#### **TOPIC: FUNCTIONS**

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#### **QUESTION 1**

Describe the difference between predefined function and programmer-defined function?

- Predefined function is a built-in function that come with the compiler, its source code (definition) does not appear in your program. It cannot be modify nor changed.
- On the other hand, programmer-defined function is a function created by the programmer in which the source code will appear in the program and it can be modified and changed up to the programmer.

#### **QUESTION 2**

Write a statement to calculate the equation or to convert the statement below using function from library.

- Square root of y. => `sqrt(y)`
- x to the power of y. => `pow (x,y)`
- cos x. => `cos (x)`
- Change character to uppercase. => `toupper (char)`
- Copy the string of x into string y. => `strcpy (y, x )`

#### **QUESTION 3**

What is the difference between local variable, global variable, global constant and static local variable?

- A local variable is a variable declared inside a function and can only be accessed within that function.
- A global variable is declared outside of all functions and can be accessed by any function in the program or program that start after its declaration.

- A global constant is a constant declared globally in which its value cannot be changed once it is initialized but it can still be accessed by all functions.
- A static local variable is declared inside a function with static term and accessible within the function used to declare it only but retains its value between function calls throughout program execution.

#### **QUESTION 4**

Given the following coding, fill in the blank with the “terms” of function as a comment.

```
#include <iostream>
using namespace std;
int average(int, int, int); //function prototype
int main()
{
    int x, y, z, avrg;
    cout << "Please enter three numbers:" << endl;
    cin >> x >> y >> z;
    avrg = average (x, y, z); //calling the average function
    cout << "The average of the given three numbers is: " <<
    avrg << endl;
    return 0;
}
int average(int a, int b, int c) // average function definition
header
{
    int sum, avrg2;
    sum = a + b + c;
    avrg2 = sum / 3;
    return avrg2; //return statement
}
```

## **QUESTION 5**

Find the errors in the following given code.

```
#include <iostream>
#include <cmath> // error1: library <cmath>
using namespace std;
int average(int, int); //error2 : lack 1 data type for input
int power (int); // error3: float change to int and remove p
int main()
{
    int x, y, z, avrg, powerOf;
    cout << "Please enter three numbers:" << endl;
    cin >> x >> y >> z;
    avrg = average (x, y, z); //error4: no x,y,z as arguments
    cout << "The average of the given three numbers is: " << avrg <<
endl;
    power (avrg); //error5: no argument
    cout << "The average number to the power of two is: " << power
(avrg) << endl; //error6
return 0;
}
int average(int a, int b, int c)
{
    int sum, avrg2;
    sum = a + b + c;
    avrg2 = sum / 3;
return avrg2; //error 7: return statement
}
```

```
int power (int p)
{
    int pOf;
    pOf = pow(p,2);
    return pOf; } //error8 : return 0 to return pOf
```

### **QUESTION 6**

Write a C++ program to calculate a rectangle's area. The program consists of the following function:

- `getLength` – This function should ask the user to enter the rectangle's length, and then returns that value as a double
- `getWidth` – This function should ask the user to enter the rectangle's width, and then returns that value as a double.
- `getArea` – This function should accept the rectangle's length and width as arguments and return the rectangle's area.
- `displayData` – This function should accept the rectangle's length, width and area as arguments, and display them in an appropriate message on the screen.
- `main` – This function consists of calls to the above functions.

For Question 6, provide the answer in .cpp file,

```

#include <iostream>
using namespace std;

double getLength ();
double getWidth ();
double getArea (double, double);
void displayData(double, double, double);

double getLength(){
    double Length;
    cout << "Enter the length of the rectangle: ";
    cin >> Length;
    return Length;
}

double getWidth(){
    double Width;
    cout << "Enter the width of the rectangle: ";
    cin >> Width;
    return Width;
}

double getArea (double L, double W){
    double area;
    area = L * W;
    return area;
}

void displayData (double Length, double Width, double area){
    cout << "\n\n";
    cout << "The length of the rectangle is: " << Length<< endl;
    cout << "The width of the rectangle is: " << Width << endl;
    cout << "The area of the rectangle is: " << area << endl;
}

int main(){
    double Length, Width, area;
    Length = getLength();
    Width = getWidth();
    area = getArea (Length, Width);
    displayData( Length, Width, area);

    return 0;
}

```

```
Enter the length of the rectangle: 5  
Enter the width of the rectangle: 9
```

```
The length of the rectangle is: 5  
The width of the rectangle is: 9  
The area of the rectangle is: 45
```

```
-----  
Process exited after 2.941 seconds with return value 0  
Press any key to continue . . . |
```