LAB EXERCISE 3

TOPIC: FUNCTIONS

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QUESTION 1

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

Predifined function

- come with compiler
- the definition of predefined functions does not appear in program
- to use predefined functions, simply need to include the proper header file and know the name of function that wish to use

Programmer-defined function

- created by programmer
- normally used to break a problem down into small manageable pieces

QUESTION 2

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

a) Square root of y.

```
a=sqrt(y);
```

b) x to the power of y.

```
a=pow(x.y);
```

c) cos x.

```
a=cos(x);
```

d) Change character to uppercase.

```
a=toupper(y);
```

e) Copy the string of x into string y.

```
strcpy(str y, str x);
```

QUESTION 3

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

Local variable

- Hidden from the statements in other functions, which normally cannot access them
- Variables defined inside a function
- Exist only while the function is executing
- Not automatically initialized

Global variable

- Any variable defined outside all the functions in a program
- Can be accessed by all function
- Automatically initialized to 0 (numeric) or NULL (character) when the variable is defined

Global constant

- Values that do not change throughout the program's execution
- Constants are then used for those values throughout the program

Static local variable

- Retain local variable contents between function calls
- Defined and initialized only the first time the function is executed
- Default initialization value is 0

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); //function call
      cout << "The average of the given three numbers is: " <<
     avrg << endl;
      return 0;
}
int average(int a, int b, int c) //function definition
{
      int sum, avrg2;
      sum = a + b + c;
      avrg2 = sum / 3;
      return avrg2; //value being returned
}
```

QUESTION 5

Find the errors in the following given code.

```
#include <iostream>
#include <cmath> //error1
using namespace std;
int average(int, int, int); //error2
int power (float); //error3
int main()
{
 int x, y, z, avrg, powerOf;
 cout << "Please enter three numbers:" << endl;
 cin >> x >> y >> z;
 avrg = average (x, y, z); //error4
 cout << "The average of the given three numbers is: " << avrg
<<  endl;
 powerOf=power (avrg); //error5
 cout << "The average number to the power of two is: " << powerOf<<
endl; //error6
return 0;
}
int average(int a, int b, int c)
{
 int sum, avrg2;
 sum = a + b + c;
 avrg2 = sum / 3;
return avrg2; //error7
}
int power (float p) //error8
{
 int pOf;
 pOf = pow(p,2);
```

```
 return pOf; //error9
}
```

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.