LAB EXERCISE 3

TOPIC: FUNCTIONS

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QUESTION 1

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

- Programming-defined function is a function that created by the programmer itself which commonly used to break problem down into specific tasks while predefined function is a built-in function that has been provided by the programming language itself where proper header file should be included.

QUESTION 2

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

a) Square root of y.
   Answer: sqrt(y);
b) x to the power of y.
   Answer: pow(x,y);
c) cos x.
   Answer: cos (x);
d) Change character to uppercase.
   Answer: toupper();
e) Copy the string of x into string y.
   Answer: strycpy(y,x);

QUESTION 3

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

- Local variable is the variables that are defined inside the function where the other function cannot access to them. In other hand, global variable is any variable that defined outside from all the functions and this variable can be used or access by all functions throughout the program.
- Global constant is defined for values that are constant throughout the program's execution but static local variables retain their contents between function calls and initialized only first-time function is executed.

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 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>
using namespace std;
int average(int, int);
int power (float p);
int main()
{
 int x, y, z, avrg, powerOf;
 cout << "Please enter three numbers:" << endl;
 cin >> x >> y >> z;
 avrg = average ();
 cout << "The average of the given three numbers is: " << avrg <<
endl;
 power ();
 cout << "The average number to the power of two is: " << power ()
<< endl;
return 0;
}
int average(int a, int b, int c)
{
 int sum, avrg2;
 sum = a + b + c;
 avrg2 = sum / 3;
```

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

ERROR	CORRECTION
1. Library function which is compiler directive is not exist	#include <cmath>
2. There are too few arguments list	int average(int,int,int);
3. Different declaration of data type for function prototype and function header	int power (int p);
4. There's no argument list	avrg = average (x,y,z);
5. There's no argument list	powerOf = power(avrg);
6. There's no argument list that match with function	cout << "The average number to the power of two is: " << powerOf << endl;
7. There's no return statement in function returning non-void	return avrg2;
8. Different return statement in function returning non-void	return pOf;

AFTER CORRECTION

```
#include <iostream>
#include <cmath> //error 1
using namespace std;

int average(int, int, int); //error 2
int power(int p); //error 3

int main()
{
 int x, y, z, avrg, powerOf;
 cout << "Please enter three numbers:" << endl;
 cin >> x >> y >> z;
 avrg = average (x,y,z); //error 4
 cout << "The average of the given three numbers is: " << avrg <<  endl;
 powerOf = power (avrg); //error 5
 cout << "The average number to the power of two is: " << powerOf << endl; //error 6
return 0;
}

int average(int a, int b, int c)
{
 int sum, avrg2;
 sum = a + b + c;
 avrg2 = sum / 3;
 return avrg2; //error 7
}

int power (int p)
{
 int pOf;
 pOf = pow(p,2);
 return pOf; //error 8
}
```

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.