Lab 3: Function, Function Overloading, Inline Function

Theory:

- Define function, function declaration, function definition, function call and returning a value in function.
- Define function overloading. List down its pros.
- Define inline functions. What things needs to be considered while defining inline function.
- Differentiate between pass by value and pass by reference in brief.

Question: 1

WAP to add two numbers using *function in C++*.

```
#include<iostream>
using namespace std;
int add(int, int); // Function Declaration
int main()
{
     int a, b, sum;
     cout << "Enter two numbers:"<< endl;
     cin>>a>>b;
     sum = add(a, b); //Function call
     cout<<"The sum is: "<< sum<<endl;
     return 0;
}
int add(int x, int y) //Function definition
{
     int s;
     s = x + y;
     return s;
}
```

Output:

Question: 2

WAP to multiply three numbers using *function in C++*.

Question: 3

WAP to find the volume of a cube, cuboid and cylinder using the concept of *function overloading*

```
#include<iostream>
using namespace std;
void volume(float l)
{
    cout<<"The volume of the cube is:"<<l*l*l<<endl;
}
void volume(float l,float b,float h)
{
    cout<<"The volume of the cuboid is:"<<l*b*h<<endl;
}
void volume(float r, float h)
{
    cout<<"The volume of the cylinder is:"<<3.14*r*r*h;
}

int main( )
{
    volume(3.5);
    volume(3.5,6.5,9.5);
    volume(3.5,5.5);
    return 0;
}
```

Output:

Question: 4

WAP to find the cube of a integer , float and double number using the concept of *function overloading(passing single argument to the function)*

```
#include<iostream>
using namespace std;
void findcube(int a){
   cout<<"The cube of the integer number is:"<<a*a*a<<endl;
}
void findcube(float b)
{
   cout<<"The cube of the float number is:"<<b*b*b<<endl;
}
void findcube(double c)
{
   cout<<"The cube of the double number is:"<<c*c*c;
}

int main( )
{
   int x;
   float y;
   double z;
   cout<<"Enter values for int, float double type variables
respectively:";
   cin>>x>>y>>z;
   findcube(x);
   findcube(y);
   findcube(z);
   return 0;
}
```

Output:

Question: 5

WAP to create a function findarea( ) to find area of rectangle, square and cube on the basis of parameters passed to it.

```
#include<iostream>
using namespace std;
void findarea(float l,float b)
{
   cout<<"The area of the rectangle="<<l*b<<endl;
}
void findarea(float l)
```

```
{
   cout<<"The area of the square="<<l*l<<endl;
}
void findarea(double l)
{
   cout<<"The area of the cube="<<6*l*l<<endl;
}
int main( )
{
   findarea(5.5,6.5);
   findarea(7.5f); //f after a number (like 7.5f) indicates that the literal is of type float
   findarea(8.5); //findarea(9); error
   return 0;
}
```

Output:

Question: 6

WAP to show an example of inline function:

```
#include <iostream>
using namespace std;
inline double cube(double s)
{
    return s * s * s;
}
int main()
{
    cout << "The cube of 3 is: " << cube(3.0) << "\n";
    cout << "The cube of 4 is: " << cube(2.5 + 1.5) << "\n";
    return 0;
}
```

Output:

Question: 7

Volume of Ellipsoid = (4/3) × pi × radius1 × radius2 × radius3. Write a program having function volume () which takes three float arguments: radius1, radius 2 and radius3 and returns the volume of an Ellipsoid. Use default argument of 2 for radius1, 3 for radius2 and 4 for radius3 so that if arguments are omitted then the

volume of Ellipsoid is always 100.48. WAP with a main ( ) function that gets values from the user to test this function.

```
#include <iostream>
using namespace std;

float volume(float radius1 = 2, float radius2 = 3, float radius3 = 4) {
    const float pi = 3.14;
    return (4.0f / 3.0f) * pi * radius1 * radius2 * radius3;
}

int main() {
    float r1, r2, r3;
    char choice;

    cout << "Do you want to enter custom radii? (y/n): ";
    cin >> choice;

    if (choice == 'y' || choice == 'Y') {
        cout << "Enter radius1: ";
        cin >> r1;
        cout << "Enter radius2: ";
        cin >> r2;
        cout << "Enter radius3: ";
        cin >> r3;

        cout << "Volume of ellipsoid is: " << volume(r1, r2, r3) << endl;
    } else {
        cout << "Using default values (2, 3, 4)" << endl;
        cout << "Volume of ellipsoid is: " << volume() << endl;
    }

    return 0;
}
```

Output:

Question: 8

WAP to show call by reference in C++.

```
#include<iostream>
using namespace std;
void swap(int &x, int &y)
{
  int temp;
  temp=x;
  x=y;
  y=temp;
}

int main( )
{
   int a=5,b=9;
   cout<<"Before swapping"<<endl;
   cout<<"Value of a="<<a;
   cout<<"\tValue of b="<<b<<endl;
   swap(a,b);
   cout<<"After swapping"<<endl;
   cout<<"Value of a="<<a;
   cout<<"\tValue of b="<<b;
return 0;
}
```

Output:

Conclusion:

- What did you learn from the lab?