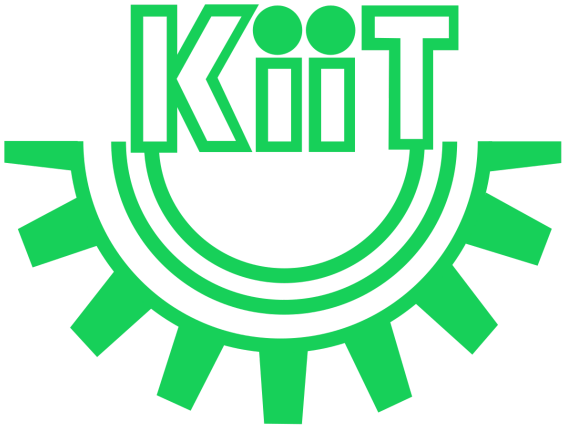
OBJECT ORIENTED PROGRAMMING SYSTEM

Lab Assignment - 2



Date: 27/07/2022

Submitted by:
Unik Dahal
21052959
CSE 36

1)WAP to add two numbers

Code:

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

int main(){
        int a,b;
        cout<<"Enter two numbers"<<endl;
        cin>>a>>b;
        int sum=a+b;
        cout<<"The sum is "<<sum<<endl;
        return 0;
}
```

Output

```
unik@unik:~/OOPS-Lab/02 Lab$ gedit HA21_add.cpp
unik@unik:~/OOPS-Lab/02 Lab$ sudo g++ HA21_add.cpp
unik@unik:~/OOPS-Lab/02 Lab$ ls
a.out  HA21_add.cpp
unik@unik:~/OOPS-Lab/02 Lab$ ./a.out
Enter two numbers
5 6
The sum is 11
unik@unik:~/OOPS-Lab/02 Lab$
```

2)WAP to check even or odd

Code:

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

int main(){
    int n;
    cout<<"Enter the number"<<endl;
    cin>>n;

    if (n%2==0)
    {
       cout<<"Even"<<endl;
    }
    else{
        cout<<"Odd"<<endl;
    }
    return 0;

}
```

Output

```
unik@unik:~/OOPS-Lab/02 Lab$ g++ HA22_evenorodd.cpp
unik@unik:~/OOPS-Lab/02 Lab$ ./a.out
Enter the number
5
Odd
unik@unik:~/OOPS-Lab/02 Lab$
```

3) WAP to find factorial of a number

Code:

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

int main(){
    int n;
    cout<<"Enter the number"<<endl;
    cin>>n;
    int fact=1;
    while(n!=0){
        fact=fact*n;
        n--;
    }
    cout<<fact;
    return 0;
}
```

Output

```
unik@unik:~/OOPS-Lab/02 Lab$ gedit HA23_factorial.cpp
unik@unik:~/OOPS-Lab/02 Lab$ g++ HA23_factorial.cpp
unik@unik:~/OOPS-Lab/02 Lab$ ./a.out
Enter the number
5
120unik@unik:~/OOPS-Lab/02 Lab$
```

4)WAP to swap two numbers(call by value ,call by reference and call b y address)

Call by Value

```cpp
// call by value
#include<iostream>
using namespace std;

void swap(int a, int b){
        int temp;
        temp=a;
        a=b;
        b=temp;
        cout<<"\nAfter Swapping: "<<a<<" "<<b<<endl;

}

int main(){
        int a,b;
        cout<<"Enter two numbers: ";
        cin>>a>>b;
        cout<<"Before Swapping: "<<a<<" "<<b;
        swap(a,b);
}
```

Output

```
unik@unik:~/OOPS-Lab/02 Lab$ g++ HA24_swap1.cpp
unik@unik:~/OOPS-Lab/02 Lab$ ./a.out
Enter two numbers: 1 2
Before Swapping: 1 2
After Swapping: 2 1
unik@unik:~/OOPS-Lab/02 Lab$
```

Call by Address

```cpp
// call by address

#include<iostream>
using namespace std;

void swap(int* a, int* b){
        int temp;
        temp = *a;
        *a = *b;
        *b = temp;

}

int main(){
        int a,b;
        cout<<"Enter two numbers: ";
        cin>>a>>b;
        cout<<"Before Swapping: "<<a<<" "<<b;
        swap(&a,&b);
        cout<<"\nAfter Swapping: "<<a<<" "<<b<<endl;
}
```

Output

```
unik@unik:~/OOPS-Lab/02 Lab$ g++ HA24_swap2.cpp
unik@unik:~/OOPS-Lab/02 Lab$ ./a.out
Enter two numbers: 2 3
Before Swapping: 2 3
After Swapping: 3 2
unik@unik:~/OOPS-Lab/02 Lab$
```

Call By Reference

```cpp
// call  by reference

#include<iostream>
using namespace std;

void swap(int &a, int &b){
        int temp;
        temp = a;
        a=b;
        b=temp;
}

int main(){
        int a,b;
        cout<<"Enter two numbers: ";
        cin>>a>>b;
        cout<<"Before Swapping: "<<a<<" "<<b;
        swap(a,b);
        cout<<"\nAfter Swapping: "<<a<<" "<<b<<endl;
}
```

Output

```
unik@unik:~/OOPS-Lab/02 Lab$ g++ HA24_swap3.cpp
unik@unik:~/OOPS-Lab/02 Lab$ ./a.out
Enter two numbers: 3 4
Before Swapping: 3 4
After Swapping: 4 3
unik@unik:~/OOPS-Lab/02 Lab$
```

5) WAP to calculate the area of a triangle using Heron's Formula.

Code:

```cpp
//WAP to calculate the area of a triangle using Heron's Formula.

#include<iostream>
#include<math.h>
using namespace std;

int main(){
    int a,b,c;
    cout<<"Enter the length of the sides of the triangle"<<endl;
    cin>>a>>b>>c;
    int s=(a+b+c)/2;
    float area=sqrt(s*(s-a)*(s-b)*(s-c));
    cout<<"The area of the triangle is "<<area<<endl;
    return 0;
}
```

Output

```
unik@unik:~/OOPS-Lab/02 Lab$ g++ HA25_areaoftriangle.cpp
unik@unik:~/OOPS-Lab/02 Lab$ ./a.out
Enter the length of the sides of the triangle
3 4 5
The area of the triangle is 6
unik@unik:~/OOPS-Lab/02 Lab$
```

6) Program to find average marks obtained by a class of 10 students in a test.

```cpp
//Program to find average marks obtained by a class of 10 students in a test.

#include<iostream>
using namespace std;

int main(){
    float marks[10];
    float sum=0;
    for(int i=0;i<10;i++){
        cout<<"Enter the marks of student "<<i+1<<endl;
        cin>>marks[i];
        sum=sum+marks[i];
    }
    float average=sum/10;
    cout<<"The average marks of the class is "<<average<<endl;
    return 0;
}
```

Output

```
unik@unik:~/OOPS-Lab/02 Lab$ gedit HA26_averagemarks.cpp
unik@unik:~/OOPS-Lab/02 Lab$ g++ HA26_averagemarks.cpp
unik@unik:~/OOPS-Lab/02 Lab$ ./a.out
Enter the marks of student 1
3
Enter the marks of student 2
4
Enter the marks of student 3
5
Enter the marks of student 4
6
Enter the marks of student 5
7
Enter the marks of student 6
8
Enter the marks of student 7
9
Enter the marks of student 8
1
Enter the marks of student 9
0
Enter the marks of student 10
2
The average marks of the class is 4.5
unik@unik:~/OOPS-Lab/02 Lab$
```

7) WAP to calculate the sum of digits of a given number

```cpp
//WAP to calculate the sum of digits of a given number.

#include<iostream>
using namespace std;

int main(){
    int n;
    cout<<"Enter the number"<<endl;
    cin>>n;
    int sum=0;
    while(n!=0){
        sum=sum+n%10;
        n=n/10;
    }
    cout<<"The sum of digits is "<<sum<<endl;
    return 0;
}
```

Output

```
unik@unik:~/OOPS-Lab/02 Lab$ gedit HA27_sumofdigits.cpp
unik@unik:~/OOPS-Lab/02 Lab$ g++ HA27_sumofdigits.cpp
unik@unik:~/OOPS-Lab/02 Lab$ ./a.out
Enter the number
123
The sum of digits is 6
unik@unik:~/OOPS-Lab/02 Lab$
```

8) WAP to find the GCD/HCF of two number

Code:

```cpp
//WAP to find the GCD/HCF of two numbers .

#include<iostream>
using namespace std;

int main(){
    int a,b;
    cout<<"Enter the two numbers"<<endl;
    cin>>a>>b;
    int gcd=1;
    for(int i=1;i<=a&&i<=b;i++){
        if(a%i==0&&b%i==0){
            gcd=i;
        }
    }
    cout<<"The GCD is "<<gcd<<endl;
    return 0;
}
```

Output

```
unik@unik:~/OOPS-Lab/02 Lab$ gedit HA28_GCD.cpp
unik@unik:~/OOPS-Lab/02 Lab$ g++ HA28_GCD.cpp
unik@unik:~/OOPS-Lab/02 Lab$ ./a.out
Enter the two numbers
15 18
The GCD is 3
unik@unik:~/OOPS-Lab/02 Lab$
```

9)WAP to check whether a given number is prime or not

Code:

```cpp
//9.WAP to check whether a number n is prime number or not.

#include<iostream>
using namespace std;

int main(){
    int n;
    cout<<"Enter the number"<<endl;
    cin>>n;
    int prime=0;
    for(int i=2;i<=n/2;i++){
        if(n%i==0){
            prime=1;
            break;
        }
    }
    if(prime==0){
        cout<<"Prime"<<endl;
    }
    else{
        cout<<"Not Prime"<<endl;
    }
    return 0;
}
```

Output

```
unik@unik:~/OOPS-Lab/02 Lab$ ./a.out
Enter the number
11
Prime
unik@unik:~/OOPS-Lab/02 Lab$
```

10) WAP to check whether an input integer is perfect number or not.

```cpp
//WAP to check whether an input integer is perfect number or not.

#include<iostream>
using namespace std;

int main(){
    int n;
    cout<<"Enter the number"<<endl;
    cin>>n;
    int sum=0;
    for(int i=1;i<n;i++){
        if(n%i==0){
            sum=sum+i;
        }
    }
    if(sum==n){
        cout<<"Perfect Number"<<endl;
    }
    else{
        cout<<"Not Perfect Number"<<endl;
    }
    return 0;
}
```

Output

```
unik@unik:~/OOPS-Lab/02 Lab$ ./a.out
Enter the number
6
Perfect Number
unik@unik:~/OOPS-Lab/02 Lab$
```

11) WAP to find the first n number of a fibonacci series

```cpp
//WAP to find the first n numbers of a Fibonacci sequence

#include<iostream>
using namespace std;

int main(){
    int n;
    cout<<"Enter the number"<<endl;
    cin>>n;
    int a=0,b=1,c;
    cout<<a<<" "<<b<<" ";
    for(int i=0;i<n-2;i++){
        c=a+b;
        a=b;
        b=c;
        cout<<c<<" ";
    }
    return 0;
}
```

Output

```
unik@unik:~/OOPS-Lab/02 Lab$ gedit HA2_11_fibonacci.cpp
unik@unik:~/OOPS-Lab/02 Lab$ g++ HA2_11_fibonacci.cpp
unik@unik:~/OOPS-Lab/02 Lab$ ./a.out
Enter the number
5
0 1 1 2 3 unik@unik:~/OOPS-Lab/02 Lab$
```