OOP LABORATORY 3

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1) WAP to find area of a circle, a rectangle and a triangle, using concept of function overloading.

PROGRAM CODE:-

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

float area(int r)
{
return (3.14*r*r);
}

float area(int a,int b, int c)
{
    float p=a+b+c,s;
    s=p/2;
    return sqrt(s*(s-a)*(s-b)*(s-c));
}

float area(int length, int width)
{
  return length*width;

}

int main()
{
int rad,a,b,c,length,width,ch;
cout<<"Area of which shape do you want?\n 1.Circle\n 2.Triangle\n 3.Rectangle\n
        Enter your choice:\n ";
cin>>ch;
```

```cpp
switch (ch)
    {   case 1 : cout<< "Enter Radius of Circle\n";
            cin>>rad;
            cout<<"Area of Circle is "<<area(rad)<<endl;
            break;
        case 2 : cout<< "Enter sides of triangle\n";
            cin>>a>>b>>c;
            cout<<"Area of the triangle is "<<area(a,b,c)<<endl;
            break;
        case 3 : cout<< "Enter length and width of Rectangle\n";
            cin>>length>>width;
            cout<<"Area of rectangle is "<<area(length,width);
            break;
        default: cout<<"Wrong input"<<endl;
    }
}
```

OUTPUT:-

```
Area of which shape do you want?
1.Circle
2.Triangle
3.Rectangle
Enter your choice:
2
Enter sides of triangle
5
6
7
Area of the triangle is 14.6969
```

2)   WAP to find volume of a sphere, a cylinder and a cuboid, using function overloading.

PROGRAM CODE:-

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

float vol (float r)                    //sphere
{
    return (4 * 3.14 * r * r * r) / 3;
}
```

```cpp
float vol (float r, float h)                //Cylinder
{
        return (3.14 * r * r * h);
}

float vol (float l, float b, float h)      //Cuboid
{
        return (l * b * h);
}


int main ()
{
        float r, l, b, h, t;
         cout << "Enter the Radius of Sphere:" << endl;
        cin >> r;
        cout << "Volume of Sphere :" << vol (r) << endl;

        cout << "Enter the Radius & Height of Cylinder: " << endl;
        cin >> r >> h;
        cout << "Volume of Cylinder: " << vol (r, h) << endl;

        cout << "Enter the Length,Breadth & Height of Cuboid: " << endl;
        cin >> l >> b >> h;
        cout << "Volume of Cuboid: " << vol (l, b, h) << endl;

}
```

OUTPUT:-

```
Enter the Radius of Sphere:
3
Volume of Sphere :113.04
Enter the Radius & Height of Cylinder:
4
5
Volume of Cylinder: 251.2
Enter the Length,Breadth & Height of Cuboid:
6
7
8
Volume of Cuboid: 336
```

3) WAP which displays a given character, n number of times, using a function. When the n value is not provided, it should print the given character 80 times. When both the character and n value is not provided, it should print '*' character 80 times.
[Write the above program in two ways:-
-using function overloading. -using default arguments.]

PROGRAM CODE:-

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


void print(char x='*', int n=80)
{
        for(int i=0;i<n;i++){
    cout<<x<<" ";
  }
  cout<<endl;
}

int main(){
   int n,op;
   bool flag=true;
   char a;
   while(flag){
      cout<<"1.Enter number and char."<<endl;
      cout<<"2.Enter only char."<<endl;
      cout<<"3.No input."<<endl;
      cout<<"Enter your options: "<<endl;
      cin>>op;
      if(op==1){
         cout<<"Enter the number: "<<endl;
         cin>>n;
         cout<<"Enter the char: "<<endl;
         cin>>a;
         print(a,n);
      }
      else if(op==2){
         cout<<"Enter the char: "<<endl;
         cin>>a;
         print(a);
      }
      else if(op==3){
         print();
      }
      else{flag=false;}
   }
   return 0;

}
```

OUTPUT:-

```
1.Enter number and char.
2.Enter only char.
3.No input.
Enter your options:
3
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
* * * * * * * * * * * * * * * * * * * *
1.Enter number and char.
2.Enter only char.
3.No input.
Enter your options:
1
Enter the number:
6
Enter the char:
A
A A A A A A
1.Enter number and char.
2.Enter only char.
3.No input.
Enter your options:
2
Enter the char:
B
B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B
B B B B B B B B B B B B B B B B B B B B B
1.Enter number and char.
2.Enter only char.
3.No input.
Enter your options:
4
```

4) WAP to find square and cube of a number using inline function.

PROGRAM CODE:-

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

class lab
{
public:
  inline int square (int n)
  {
        return n * n;
  }
  inline int cube (int n)
  {
        return n * n * n;
  }
};
int main ()
{
        lab num;
        int n;
        cout << "Enter the Number: " << endl;
        cin >> n;
        cout << "Square of " << n << " = " << num.square (n) << endl;
        cout << "Cube of " << n << " = " << num.cube (n) << endl;
        return 0;
}
```

OUTPUT:-

```
Enter the Number:
6
Square of 6 = 36
Cube of 6 = 216
```

5) WAP to swap two variables using pass by reference.

PROGRAM CODE:-

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

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

}

int main ()
{
  int a, b;
  cout << "Enter Two values" << endl;
  cin >> a >> b;
  cout << "Before swap, value of a :" << a << endl;
  cout << "Before swap, value of b :" << b << endl;
  swap (a, b);
  cout << "After swap, value of a :" << a << endl;
  cout << "After swap, value of b :" << b << endl;
  return 0;
}
```

OUTPUT:-

```
Enter Two values
5
6
Before swap, value of a :5
Before swap, value of b :6
After swap, value of a :6
After swap, value of b :5
```

6) WAP to swap the data members in two objects, using pass by reference for objects.

PROGRAM CODE:-

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

class test
{
        int x;
        public:
                void input()
                {
                        cin>>x;
                }
                void display()
                {
                        cout<<x;
                }
                void swap(test &T)
                {
                        int t;
                        t=x;
                        x=T.x;
                        T.x=t;
                }
};

int main()
{
        test T1,T2;
        cout<<"\nEnter 1st Number:";
        T1.input();

        cout<<"\nEnter 2nd Number:";
        T2.input();

        T1.swap(T2);

        cout<<"\nNow 1st Number is:";
        T1.display();

        cout<<"\nNow 2nd Number is:";
        T2.display();

        return 0;
}
```

OUTPUT:-

```
Enter 1st Number:5

Enter 2nd Number:6

Now 1st Number is:6
Now 2nd Number is:5
---------------------------------
```