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OOP LAB-9

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Lab-9

Topic: Dynamic Binding (Virtual Functions)

i.   Create a class shape. Derive three classes from it; Circle, Square and Triangle. Find area of each shape and display it, using virtual function.

ii. Create a class which stores employee name,id and salary Derive two classes from 'Employee' class: 'Regular' and 'Part-Time'. The 'Regular' class stores DA, HRA and basic salary. The 'Part-Time' class stores the number of hours and pay per hour. Calculate the salary of a regular employee and a par-time employee, using virtual function

iii. Create a class which stores account number, customer name and balance. Derive two classes from 'Account' class: 'Savings' and 'Current'. The 'Savings' class stores minimum balance. The 'Current' class stores the over-due amount. Include member functions in the appropriate class for
>   -deposit money
>   -withdraw [For saving account minimum balance should be checked.]
>   [For current account overdue amount should be calculated.]
>   -display balance
>   Display data from each class using virtual function.

iv. WAP to demonstrate use of pure virtual function and abstract base class.

1.

```cpp
#include<iostream>

#include<cstring>

using namespace std;

class Shape

{

    public:

    virtual void get_input()

    {

        cout<<"Shape's input fn called";

    }

    virtual void area()

    {

        cout<<"Shape's area";

    }

};

class Circle:public Shape

{

    int radius;

    public:

    void get_input()

    {

        cout<<"Enter radius of circle: ";

        cin>>radius;

    }

    void area()

    {

        cout<<"\nArea of Circle is:"<<3.14*radius*radius<<endl;

    }

};
```

```cpp
class Triangle:public Shape
{
    int b,h;
    public:
    void get_input()
    {
        cout<<"Enter base of triangle: ";
        cin>>b;
        cout<<"Enter height of triangle: ";
        cin>>h;
    }
    void area()
    {
        cout<<"Area of triangle is: "<<0.5*h*b<<endl;
    }
};
class square:public Shape
{
    int l;
    public:
    void get_input()
    {

        cout<<"Enter length of square ";
        cin>>l;
    }
    void area()
    {
        cout<<"Area of square is: "<<l*l<<endl;
    }
};
```

```
int main()

{

    Shape *p1,*p2,*p3;

    Circle c;

    Triangle t;

    square r;

    p1=&c;

    p2=&t;

    p3=&r;

    p1->get_input();

    p2->get_input();

    p3->get_input();

    p1->area();

    p2->area();

    p3->area();

}
```
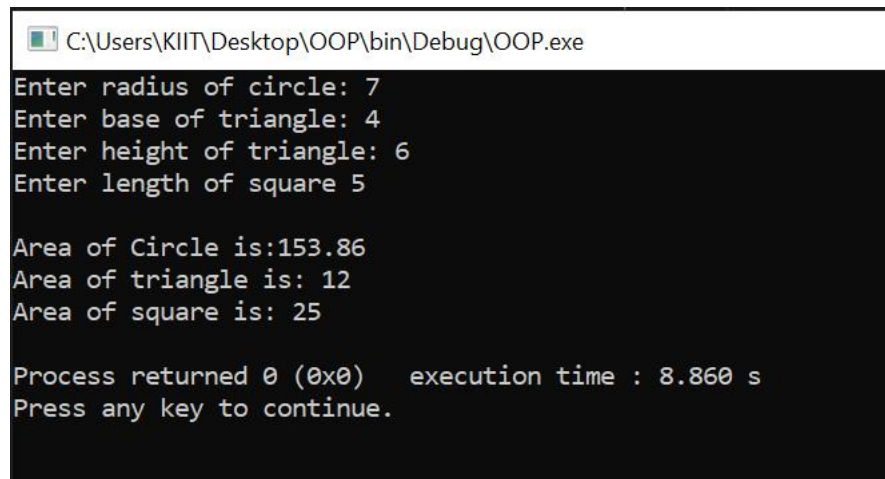
OUTPUT :


```
C:\Users\KIIT\Desktop\OOP\bin\Debug\OOP.exe
Enter radius of circle: 7
Enter base of triangle: 4
Enter height of triangle: 6
Enter length of square 5

Area of Circle is:153.86
Area of triangle is: 12
Area of square is: 25

Process returned 0 (0x0)   execution time : 8.860 s
Press any key to continue.
```

2.

```cpp
#include<iostream>

using namespace std;

class employee{

  public :

  char name[25];

  int id,salary,DA,HRA,hr,pph;

  void info()

{

  cout<<"Enter name : ";

  cin>>name;

  cout<<"Enter ID : ";

  cin>>id;

}

  void regular()

{

  cout<<"Enter salary : ";

  cin>>salary;

  cout<<"Enter DA : ";

  cin>>DA;

  cout<<"Enter HRA : ";

  cin>>HRA;

}

  void part()

{

  cout<<"Enter number of hours : ";

  cin>>hr;

  cout<<"Enter pay per hour : ";

  cin>>pph;

}

  virtual void sal() = 0;

};
```

```cpp
class regular : public employee
{
  public:
  void sal()
{
  cout<<"\nSalary of regular employee : "<<salary + DA + HRA<<endl;
}
};
class part : public employee
{
  public:
  void sal()
{
  cout<<"\nSalary of Part-time employee : "<<pph*hr*30<<endl;
}
};
int main()
{
  regular r;
  employee *er = &r;
  er->info();
  er->regular();
  er->sal();
  part p;
  employee *ep = &p;
  ep->info();
  ep->part();
  ep->sal();

  return 0;
}
```

OUTPUT :

```
C:\Users\KIIT\Desktop\OOP\bin\Debug\OOP.exe

Enter name : hamdan
Enter ID : 387
Enter salary : 1000000
Enter DA : 25
Enter HRA : 50

Salary of regular employee : 1000075
Enter name : ch
Enter ID : 783
Enter number of hours : 5
Enter pay per hour : 1000

Salary of Part-time employee : 150000

Process returned 0 (0x0)   execution time : 67.278 s
Press any key to continue.
```

3.

```cpp
#include<iostream>

using namespace std;

class account{

  public:

  int acn,balance,minbal,wd,dp,bal;

  char name[25];

  void info()

{

  cout<<"Enter account number : " ;

  cin>>acn;

  cout<<"Enter name : ";

  cin>>name;

  cout<<"Enter balance : ";

  cin>>balance;

  cout<<"Enter amount to withdraw : ";

  cin>>wd;

  cout<<"Enter amount to deposit : ";

  cin>>dp;

}

  void savings()

{

  minbal = 1000;

  bal=balance-wd+dp;

  cout<<"Minimum balance is : "<<minbal<<endl;

}
```

```cpp
    void current()

{

  bal = balance-wd+dp;

  cout<<"Current balance is : "<<bal<<endl;

}


virtual void data() = 0;

};

class savings : public account

{

  public:

  void data()

{

  cout<<"Account number : "<<acn<<endl;

  cout<<"Customer name : "<<name<<endl;

  if(bal<minbal)

  cout<<"You cannow withdraw below minimum balance, which is Rs. "<<minbal<<endl;

  else

  cout<<"Balance is : "<<bal<<endl;

}

};

class current : public account

{

  public:

  void data()

{

  cout<<"Account number : "<<acn<<endl;

  cout<<"Customer name : "<<name<<endl;

  if(bal<0)

{

  cout<<"Amount Overdued."<<endl;

}
```

```cpp
        else
        {
          cout<<"Balance is : "<<bal<<endl;
        }
      }
};


int main()
{
  int ch;
  savings s;
  account *as = &s;


  current c;
  account *ac = &c;


  while(1)
  {
    cout<<"1. Savings"<<endl;
    cout<<"2. Current"<<endl;
    cout<<"3. Exit"<<endl;


    cout<<"Enter choice : ";
    cin>>ch;


    switch(ch)
    {
      case 1 : cout<<"Savings Account."<<endl;
               as->info();
               as->savings();
               as->data();
               break;
```

```cpp
        case 2 : cout<<"Current Account."<<endl;

                ac->info();

                ac->current();

                ac->data();

                break;


        case 3 : return 0;

        default: cout<<"Wrong Choice!!"<<endl;


    }

}

}
```

OUTPUT :

```
C:\Users\KIIT\Desktop\OOP\bin\Debug\OOP.exe
1. Savings
2. Current
3. Exit
Enter choice : 1
Savings Account.
Enter account number : 387
Enter name : hamdan
Enter balance : 1000
Enter amount to withdraw : 387
Enter amount to deposit : 0
Minimum balance is : 1000
Account number : 387
Customer name : hamdan
You cannow withdraw below minimum balance, which is Rs. 1000
1. Savings
2. Current
3. Exit
Enter choice : 4
Wrong Choice!!
1. Savings
2. Current
3. Exit
Enter choice : 3

Process returned 0 (0x0)   execution time : 32.477 s
Press any key to continue.
```

4.

```cpp
#include <iostream>

using namespace std;


class Shape
{
    protected:
     float dimension;


    public:
     void Dimension()
     {
         cin >> dimension;
     }



     virtual float calculateArea() = 0;
};


class Square : public Shape
{
    public:
     float calculateArea()
     {
         return dimension * dimension;
     }
};


class Circle : public Shape
{
```

```cpp
    public:

    float calculateArea()

    {

        return 3.14 * dimension * dimension;

    }

};


int main()

{

    Square square;

    Circle circle;


    cout << "enter the th side of the square ";

    square.Dimension();

    cout << "\narea of square:"<<square.calculateArea()<< endl;


    cout << "enter the radius of the circle" ;

    circle.Dimension();

    cout << "\narea of circle:"<<circle.calculateArea() << endl;


    return 0;

}
```
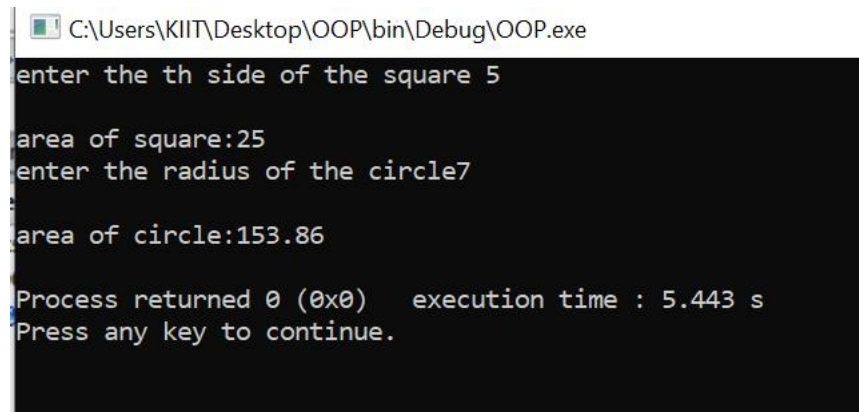
OUTPUT :


```
C:\Users\KIIT\Desktop\OOP\bin\Debug\OOP.exe
enter the th side of the square 5

area of square:25
enter the radius of the circle7

area of circle:153.86

Process returned 0 (0x0)   execution time : 5.443 s
Press any key to continue.
```