OOP LABORATORY 13

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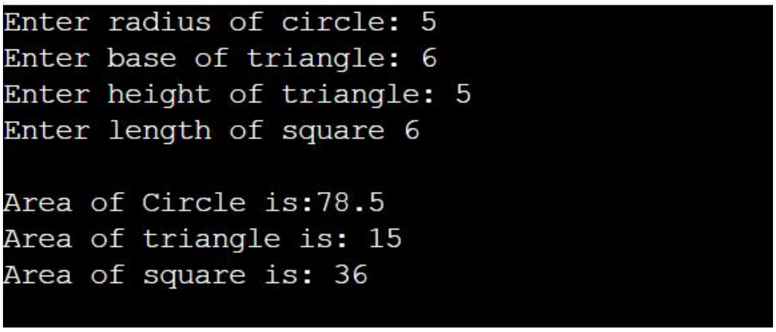
1. **Create a class shape. Derive three classes from it; Circle, Square and Triangle. Find area of each shape and display it, using virtual function.**

PROGRAM CODE:

```
#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;
    }
};


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();
    return 0;
}
```

OUTPUT:



```
Enter radius of circle: 5
Enter base of triangle: 6
Enter height of triangle: 5
Enter length of square 6

Area of Circle is:78.5
Area of triangle is: 15
Area of square is: 36
```

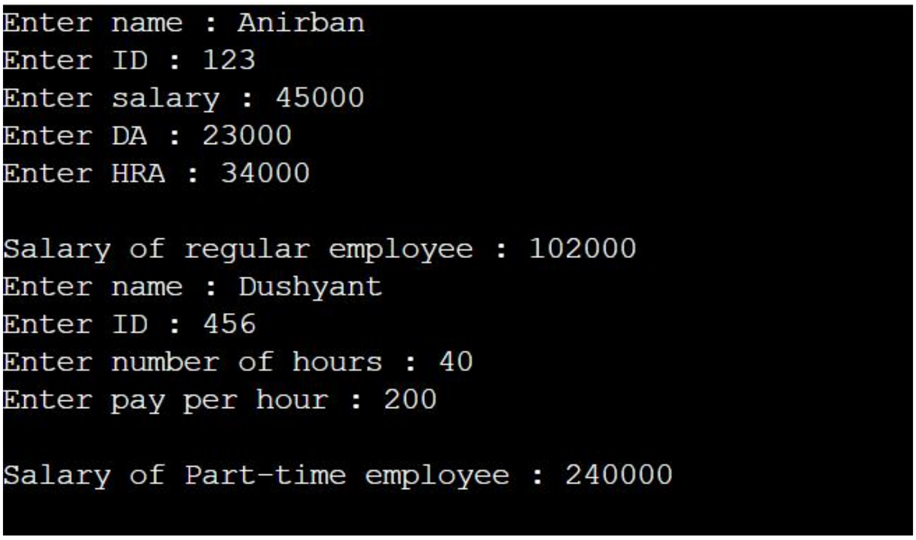
2. Create a class which stores employee name,id and salary Derive two classes from ‘Employee’ class: ‘Regular’ and ‘Part-Time’. The ‘Regular’ class stores DA, HRA and basic salary. The ‘Part-Time’ class stores the number of hours and pay per hour. Calculate the salary of a regular employee and a par-time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

PROGRAM CODE:

```
#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;
};
```

```
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:



```
Enter name : Anirban
Enter ID : 123
Enter salary : 45000
Enter DA : 23000
Enter HRA : 34000

Salary of regular employee : 102000
Enter name : Dushyant
Enter ID : 456
Enter number of hours : 40
Enter pay per hour : 200

Salary of Part-time employee : 240000
```

3. <u>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</u>
-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

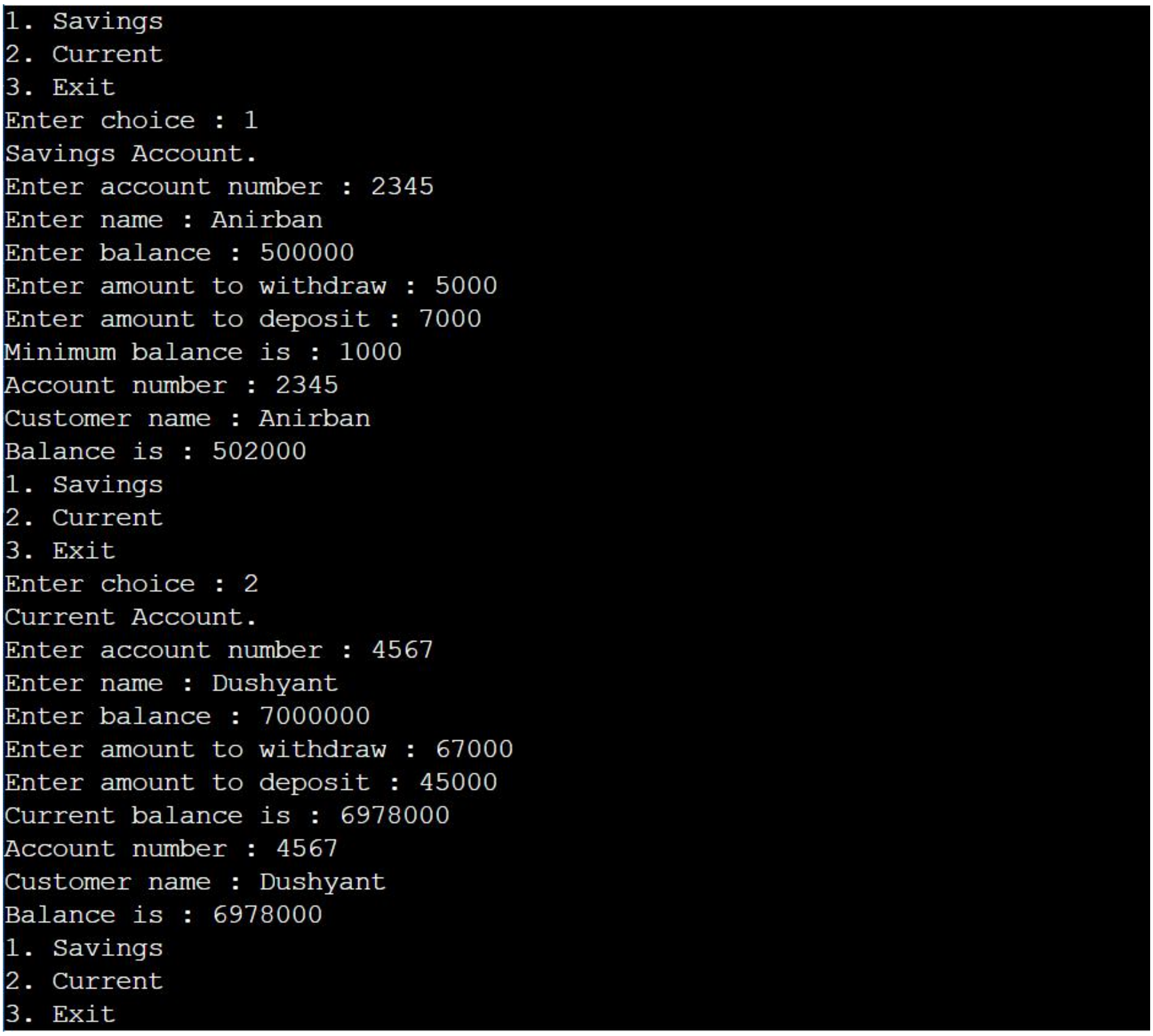
PROGRAM CODE:

```
#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;
}

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;
}
 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;

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

          ac->info();
          ac->current();
          ac->data();
          break;

 case 3 : return 0;
 default: cout<<"Wrong Choice!!"<<endl;

               }
        }
}
```

OUTPUT:



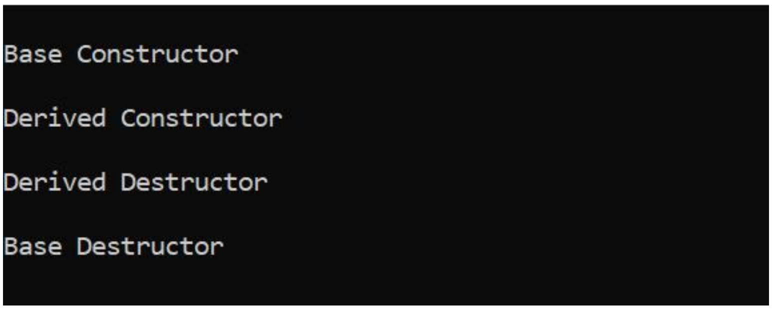
```
1. Savings
2. Current
3. Exit
Enter choice : 1
Savings Account.
Enter account number : 2345
Enter name : Anirban
Enter balance : 500000
Enter amount to withdraw : 5000
Enter amount to deposit : 7000
Minimum balance is : 1000
Account number : 2345
Customer name : Anirban
Balance is : 502000
1. Savings
2. Current
3. Exit
Enter choice : 2
Current Account.
Enter account number : 4567
Enter name : Dushyant
Enter balance : 7000000
Enter amount to withdraw : 67000
Enter amount to deposit : 45000
Current balance is : 6978000
Account number : 4567
Customer name : Dushyant
Balance is : 6978000
1. Savings
2. Current
3. Exit
```

4. Write a program to demonstrate the use of virtual destructors.

PROGRAM CODE:

```
#include<iostream>
using namespace std;
class a
{
public:
a() {printf("\nBase Constructor\n");}
virtual ~a(){printf("\nBase Destructor\n");}
};
class b : public a
{
public:
b(){printf("\nDerived Constructor\n");}
~b(){printf("\nDerived Destructor\n");}
};

int main()
{
a* obj=new b;
delete obj;
return 0;
}
```

OUTPUT:



```
Base Constructor

Derived Constructor

Derived Destructor

Base Destructor
```