



KALINGA INSTITUTE OF INDUSTRIAL TECHNOLOGY (KIIT)

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LAB 9

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```
//q1 Create a class shape. Derive three classes from it;  
Circle, Square and  
//Triangle. Find area of each shape and display it, using  
virtual function.  
#include <iostream>  
#include <math.h>  
using namespace std;  
  
class shape  
{
```

```
public:
    virtual void inp()
    {
    }
    virtual void area()
    {
    }
};

class circle : public shape
{
    int r;

public:
    void inp()
    {
        cout << "\nEnter the value of radius";
        cin >> r;
    }
    void area()
    {
        cout << "area of circle is " << 3.14 * r * r <<
endl;
    }
};

class square : public shape
{
    int a;

public:
    void inp()
    {
        cout << "\nEnter the value of side";
        cin >> a;
    }
    void area()
```

```

    {
        cout << "area of sqr is " << a * a << endl;
    }
};
class triangle : public shape
{
    int a, b, c;

public:
    void inp()
    {
        cout << "\nEnter the value of 3 sides";
        cin >> a >> b >> c;
    }
    void area()
    {
        float s = (a + b + c) / 2.0;
        float area = pow((s * (s - a) * (s - b) * (s -
c))), 1.0 / 2);
        cout << "area of triangle is " << area << "
squnit";
    }
};
int main()
{
    /* circle *c=new circle;

    square *sq=new square;
    triangle *tri=new triangle;
    shape *s[] = {c, sq, tri};
    for (int i = 0; i < 3; i++)
    {
        s[i]->inp();
        s[i]->area();
    }*/

    circle c;

```

```

square sq;
triangle tri;
shape *s[] = {&c, &sq, &tri};
for (int i = 0; i < 3; i++)
{
    s[i]->inp();
    s[i]->area();
}

return 0;
}

```

OUTPUT -1

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
Windows PowerShell
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PS D:\my codes\OOPS\LAB9_VIRTUAL_FUNCTION> cd "d:\my codes\OOPS\LAB9_VIRTUAL_FUNCTION\" ; if ($?) { g++ q1_SHAP.CPP -o q1_S
HAP } ; if ($?) { .\q1_SHAP }

Enter the value of radius5
area of circle is 78.5

Enter the value of side12
area of sqr is 144

Enter the value of 3 sides3
2
5
area of triangle is 0 squnit
PS D:\my codes\OOPS\LAB9_VIRTUAL_FUNCTION>

```

/*Q2 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*/

```
#include <bits/stdc++.h>

using namespace std;

class employee
{
protected:
    char name[20];

    int id;

    float salary;
public:
    employee(const char *n, int i)
    {

        strcpy(name, n);

        id = i;
    }

    virtual void calc()

    {
    }

    virtual void show()
```

```
    {  
    }  
};  
  
class reg_employee : public employee  
{  
  
    float da, hra, basic_sal;  
  
public:  
    reg_employee(const char *n, int i, float d, float h,  
float b) : employee(n, i)  
    {  
  
        da = d;  
  
        hra = h;  
  
        basic_sal = b;  
    }  
  
    void calc()  
  
    {  
  
        salary = basic_sal + da + hra;  
    }  
  
    void show()  
  
    {  
  
        cout << "\nname of employee: " << name;
```

```

        cout << "\nid of employee: " << id;

        cout << "\ntotal salary of employee: " << salary;
    }
};

class part_employee : public employee
{
    int n_hrs, p_hrs;

public:
    part_employee(const char *n, int i, int nh, int ph) :
    employee(n, i)

    {
        n_hrs = nh;
        p_hrs = ph;
    }

    void calc()

    {
        salary = n_hrs * p_hrs;
    }

    void show()

    {
        cout << "\n\nname of employee: " << name;
    }
};

```

```

        cout << "\nid of employee: " << id;

        cout << "\ntotal salary of employee: " << salary;
    }
};

int main()
{

    reg_employee r("RAHUL", 1001, 650, 80, 60);

    part_employee p("BABITA", 1003, 6, 150);

    employee *e[2] = {&r, &p};

    for (int i = 0; i < 2; ++i)
    {

        e[i]->calc();

        e[i]->show();
    }

    return 0;
}

```

OUTPUT -2


```

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PS D:\my codes\OOPS\LAB9_VIRTUAL_FUNCTION> cd "d:\my codes\OOPS\LAB9_VIRTUAL_FUNCTION\" ; if ($?) { g++ q2.cpp -o q2 } ; if ($?) { .\q2 }

name of employee: RAHUL
id of employee: 1001
total salary of employee: 790

name of employee: BABITA
id of employee: 1003
total salary of employee: 900
PS D:\my codes\OOPS\LAB9_VIRTUAL_FUNCTION>

```

```
/*Q3.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.*/
```

```
#include <bits/stdc++.h>
```

```
using namespace std;
```

```
class bank
{
public:
    int minbal, bal, wd, dp, s_bal, c_bal;

    char name[20];

    long int ac;

    void input(const char *n, int b, long int a)
    {
        strcpy(name, n);

        bal = b;

        ac = a;
    }

    void saving(int w, int d)
    {
        minbal = 1000;

        wd = w;

        dp = d;

        s_bal = bal + dp - wd;
    }
}
```

```

void current(int w, int d)
{
    wd = w;
    dp = d;
    c_bal = bal + dp - wd;
}

virtual void display()
{
}
};

class save : public bank
{
public:
    void display()
    {
        cout << "\naccount number: " << ac;
        cout << "\ncustomer name: " << name;
        cout << "\nminimum balance: " << minbal;
        if (s_bal < minbal)
        {

```

```

        cout << "\nyou can not withdraw
balance!!.\nyour balance is: " << s_bal;
    }

    else

        cout << "\nyou can withdraw balance.\nyour
balance is: " << s_bal;
    }
};

class curr : public bank
{
public:
    void display()

    {

        cout << "\naccount number: " << ac;

        cout << "\ncustomer name: " << name;

        if (c_bal < 0)

        {

            cout << "\noverdued ammount";
        }

        else

            cout << "\nyour current balance: " << c_bal;
    }
};

```

```
int main()
{
    save s;

    curr c;

    bank *b[2];

    b[0] = &s;

    b[1] = &c;

    cout << "\nfor saving account: ";

    b[0]->input("ABHI", 3000, 8392649);

    b[0]->saving(1000, 500);

    b[0]->display();

    cout << "\n\nfor current account: ";

    b[1]->input("MARTIN", 4000, 1723465);

    b[1]->current(2000, 1000);

    b[1]->display();

    return 0;
}
```

OUTPUT -3

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
Code + - [ ] [X] v X

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PS D:\my codes\OOPS\LAB9_VIRTUAL_FUNCTION> cd "d:\my codes\OOPS\LAB9_VIRTUAL_FUNCTION\" ; if ($?) { g++ q3.cpp -o q3 } ; if ($?) { .\q3 }

for saving account:
account number: 8392649
customer name: ABHI
minimum balance: 1000
you can withdraw balance.
your balance is: 2500

for current account:
account number: 1723465
customer name: MARTIN
your current balance: 3000
PS D:\my codes\OOPS\LAB9_VIRTUAL_FUNCTION> █
```

/*q4 WAP to demonstrate use of pure virtual function and abstract base class.[

May use the number class as base and hexadecimal , octal and decimal as

derived classes]*/

```
#include<iostream>
```

```
using namespace std;
```

```
class number
```

```
{
```

```
protected:
```

```
    int value;
```

```
public:
```

```
void input(int i)

{
    value = i;
}

virtual void show() = 0;
};

class deci_ : public number
{
public:
    void show()

    {
        cout << "\ndecimal number: " << value;
    }
};

class hexa : public number
{
public:
    void show()

    {
        cout << "\nhexadecimal number: " << hex << value;
    }
};
```

```
class octa : public number
{
public:
    void show()
    {
        cout << "\nocta number: " << oct << value;
    }
};

int main()
{
    number *ptr[3];

    deci_ d;

    hexa h;

    octa o;

    ptr[0] = &d;

    ptr[0]->input(12);

    ptr[0]->show();

    ptr[1] = &h;

    ptr[1]->input(12);

    ptr[1]->show();
```



```
ptr[2] = &o;  
  
ptr[2]->input(12);  
  
ptr[2]->show();  
  
return 0;  
}
```

OUTPUT -4



```
Windows PowerShell  
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PS D:\my codes\OOPS\LAB9_VIRTUAL_FUNCTION> cd "d:\my codes\OOPS\LAB9_VIRTUAL_FUNCTION\" ; if ($?) { g++ q4_pure_virtual.cpp  
-o q4_pure_virtual } ; if ($?) { .\q4_pure_virtual }  
  
decimal number: 12  
hexadecimal number: c  
octa number: 14  
PS D:\my codes\OOPS\LAB9_VIRTUAL_FUNCTION> █
```

//q5.Also do the media class as base class and book and
tape as derived class
//program too, as discussed in the theory class.
#include <bits/stdc++.h>

```
using namespace std;

class media
{
protected:
    char name[20];

    int price;

public:
    media(const char *n, int p)
    {
        strcpy(name, n);

        price = p;
    }

    virtual void display()
    {
    }
};

class book : public media
{
    int pages;

public:
    book(const char *n, int p, int pa) : media(n, p)
```

```

{
    pages = pa;
}

void display()
{
    cout << "\ntitle of book: " << name;

    cout << "\nprice of book: " << price;

    cout << "\npages of book: " << pages;
}
};

class tape : public media
{
    int time_;

public:
    tape(const char *n, int p, int t) : media(n, p)
    {
        time_ = t;
    }

    void display()
    {

```

```

        cout << "\n\ntitle of book: " << name;

        cout << "\nprice of book: " << price;

        cout << "\nplay time of book: " << time_ << "
minutes";
    }
};

int main()
{

    book b("C", 450, 700);

    tape t("C++", 485, 90);

    media *m[2];

    m[0] = &b;

    m[0]->display();

    m[1] = &t;

    m[1]->display();

    return 0;
}

```

OUTPUT -5

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```
PS D:\my codes\OOPS\LAB9_VIRTUAL_FUNCTION> cd "d:\my codes\OOPS\LAB9_VIRTUAL_FUNCTION\" ; if ($?) { g++ q5.cpp -o q5 } ; if ($?) { .\q5 }
```

title of book: C

price of book: 450

pages of book: 700

title of book: C++

price of book: 485

play time of book: 90 minutes

```
PS D:\my codes\OOPS\LAB9_VIRTUAL_FUNCTION> █
```

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