**Virtual functions**

**Q no.1:**

**Previously:**

#include <iostream>

using namespace std;

class parent

{

public:

void showdata()

{

cout<<"Parent class"<<endl;

}

};

class child:public parent

{

void showdata()

{

cout<<"Child 1 Class"<<endl;

}

};

class child1:public parent

{

void showdata()

{

cout<<"Child 2 class"<<endl;

}

};

void main()

{

parent \*p;

child c1;

child1 c2;

p=&c1;

p->showdata();

p=&c2;

p->showdata();

}

**After:**

#include <iostream>

using namespace std;

class parent

{

public:

virtual void showdata()

{

cout<<"Parent class"<<endl;

}

};

class child:public parent

{

void showdata()

{

cout<<"Child 1 Class"<<endl;

}

};

class child1:public parent

{

void showdata()

{

cout<<"Child 2 class"<<endl;

}

};

void main()

{

parent \*p;

child c1;

child1 c2;

p=&c1;

p->showdata();

p=&c2;

p->showdata();

}

Abstract class:

#include <iostream>

#include <string>

using namespace std;

class person

{

int nic;

char gender;

string address;

public:

void getdata()

{

cout<<"NIC:"<<endl;

cin>>nic;

cout<<"GENDER:"<<endl;

cin>>gender;

cout<<"Address:"<<address<<endl;

}

void showdata()

{

cout<<"NIC: "<<nic<<endl;

cout<<"GENDER: "<<gender<<endl;

cout<<"ADDRESS: "<<address<<endl;

}

virtual bool IsOutstanding()=0;

};

void main()

{

person p;

}

Q no.3

#include <iostream>

#include <string>

using namespace std;

class person

{

int nic;

char gender;

string address;

public:

void getdata()

{

cout<<"NIC:"<<endl;

cin>>nic;

cout<<"GENDER:"<<endl;

cin>>gender;

cout<<"Address:"<<address<<endl;

cin>>address;

}

void showdata()

{

cout<<"NIC: "<<nic<<endl;

cout<<"GENDER: "<<gender<<endl;

cout<<"ADDRESS: "<<address<<endl;

}

virtual bool IsOutstanding()=0;

};

class student :public person

{

private:

float gpa;

public:

void getdata()

{

person::getdata();

cout<<"GPA: "<<endl;

cin>>gpa;

}

void showdata()

{

person::showdata();

cout<<"GPA: "<<gpa<<endl;

}

bool IsOutstanding()

{

if(gpa>=3.67)

return true;

return false;

}

};

class professor:public person

{

private:

int pub;

public:

void getdata()

{

person::getdata();

cout<<"NUMBER OF PUBLICATIONS :"<<endl;

cin>>pub;

}

void showdata()

{

person::showdata();

cout<<"NUMBER OF PUBLICATIONS :"<<pub<<endl;

}

bool IsOutstanding()

{

if(pub>=50)

return true;

return false;

}

};

void main()

{

student s;

s.getdata();

s.showdata();

if(s.IsOutstanding())

{

cout<<"OUTSTANDING: "<<endl;

}

else

cout<<"AVERAGE!"<<endl;

}

Q NO.4

#include <iostream>

#include <string>

using namespace std;

class person

{

int nic;

char gender;

string address;

public:

virtual void getdata()

{

cout<<"NIC:"<<endl;

cin>>nic;

cout<<"GENDER:"<<endl;

cin>>gender;

cout<<"Address:"<<address<<endl;

cin>>address;

}

virtual void showdata()

{

cout<<"NIC: "<<nic<<endl;

cout<<"GENDER: "<<gender<<endl;

cout<<"ADDRESS: "<<address<<endl;

}

virtual bool IsOutstanding()=0;

};

class student :public person

{

private:

float gpa;

public:

virtual void getdata()

{

cout<<"Enter STUDENT'S INFO :"<<endl;

person::getdata();

cout<<"GPA: "<<endl;

cin>>gpa;

}

virtual void showdata()

{

cout<<"STUDENT'S INFO :"<<endl;

person::showdata();

cout<<"GPA: "<<gpa<<endl;

}

bool IsOutstanding()

{

if(gpa>=3.67)

return true;

return false;

}

};

class professor:public person

{

private:

int pub;

public:

virtual void getdata()

{

cout<<"ENTER PROFESSOR'S INFO :"<<endl;

person::getdata();

cout<<"NUMBER OF PUBLICATIONS :"<<endl;

cin>>pub;

}

virtual void showdata()

{

cout<<"PROFESSOR'S INFO :"<<endl;

person::showdata();

cout<<"NUMBER OF PUBLICATIONS :"<<pub<<endl;

}

bool IsOutstanding()

{

if(pub>=50)

return true;

return false;

}

};

void main()

{

person \*p[2]={new student(),new professor()};

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

{

cout<<"Please Enter a person's info:"<<endl;

cout<<"PERSON:"<<i+1<<endl;

p[i]->getdata();

}

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

{

cout<<"Person's Info"<<endl;

p[i]->showdata();

}

}

Q NO.5

#include <iostream>

#include <string>

#include <Windows.h>

#include <conio.h>

#include <stdlib.h>

using namespace std;

class person

{

int nic;

char gender;

string address;

public:

virtual void getdata()

{

cout<<"NIC:"<<endl;

cin>>nic;

cout<<"GENDER:"<<endl;

cin>>gender;

cout<<"Address:"<<address<<endl;

cin>>address;

}

virtual void showdata()

{

cout<<"NIC: "<<nic<<endl;

cout<<"GENDER: "<<gender<<endl;

cout<<"ADDRESS: "<<address<<endl;

}

virtual bool IsOutstanding()=0;

};

class student :public person

{

private:

float gpa;

public:

virtual void getdata()

{

cout<<"Enter STUDENT'S INFO :"<<endl;

person::getdata();

cout<<"GPA: "<<endl;

cin>>gpa;

}

virtual void showdata()

{

cout<<"STUDENT'S INFO :"<<endl;

person::showdata();

cout<<"GPA: "<<gpa<<endl;

}

bool IsOutstanding()

{

if(gpa>=3.67)

return true;

return false;

}

};

class professor:public person

{

private:

int pub;

public:

virtual void getdata()

{

cout<<"ENTER PROFESSOR'S INFO :"<<endl;

person::getdata();

cout<<"NUMBER OF PUBLICATIONS :"<<endl;

cin>>pub;

}

virtual void showdata()

{

cout<<"PROFESSOR'S INFO :"<<endl;

person::showdata();

cout<<"NUMBER OF PUBLICATIONS :"<<pub<<endl;

}

bool IsOutstanding()

{

if(pub>=50)

return true;

return false;

}

};

void main()

{

person \*p[50];

int n=0;

char choice;

do

{

int c;

cout<<"Enter Info,press 1 for professor and 2 for student: "<<endl;

cin>>c;

system ("cls");

if(c==1)

{

p[n++]=new professor();

}

else

p[n++]=new student();

p[n-1]->getdata();

cout<<"Enter ANother (?) (Y/N):"<<endl;

cin>>choice;

system ("cls");

}

while (choice =='y'||choice=='Y');

for (int i=0;i<n;i++)

{

p[i]->showdata();

if (p[i]->IsOutstanding())

cout<<"OUTSTANDING: "<<endl;

else

cout<<"average"<<endl;

}

system ("cls");

system ("PAUSE");

}