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| OPPs Sem-II  Assignment-III  5/30/2021  Sandeep Bhatt |

**Q1 : Write a program to implement the usage of static data members and**

**static member functions of a class**.

#include <iostream>

using namespace std;

class first

{

int x;

public:

First() { cout << "First's constructor called " << endl; }

};

class second

{

static first a;

public:

B() { cout << "second's constructor called " << endl; }

static first getfirst() { return first; }

};

first second::first; // definition of first

int main()

{

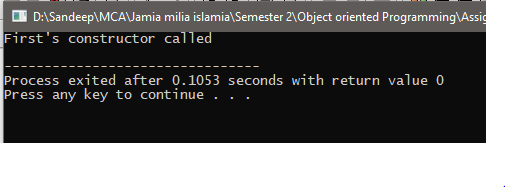
// static member 'first' is accessed without any object of second

first a = second::getfirst();

return 0;

}

Output:



**2. Write a program to generate results for 10 students using two classesStudent and Exam. Student class contains- stud\_roll, stud\_name, course\_name, dob as data members and getrec(), modifyrec(), printrec() as member functions. Exam class contains- exam\_name, paper\_name,paper\_code, marks\_obtained, total marks, grades as data members and getmarks(), modifymarks(),printresult() as member functions.**

#include<iostream>

#include<stdio.h>

using namespace std;

class student{

char stud\_name, course\_name;

int stud\_rollno,dob;

public:

void getrec(int);

void modifyrec();

char printrec(){ return stud\_name; }

};

class exam:public student{

int paper\_code,marks\_obtained,total\_marks;

char exam\_name, paper\_name,grades;

public:

void getmarks();

void modifymarks();

void printresult();

};

void student::getrec(int i)

{

char buffer[255];

bool isvalid;

fgets(buffer, sizeof(buffer), stdin); // clearing standard input stream

do{

cout << endl << "Enter name of student no " << i << " : ";

getline(cin, name);

isvalid = isValidName(name);

if(!isvalid) cout << "Invalid Name...! Try Again." << endl;

}while(!isvalid);

do{

cout << "Enter " << stud\_name << "'s rollno : ";

cin >> rollno;

if(rollno < 1) cout << "Invalid input...! Try again" << endl;

}while(rollno < 1);

fgets(buffer, sizeof(buffer), stdin); // clearing standard input stream

do{

cout << "Enter " << stud\_name << "'s course : ";

getline(cin, course);

isvalid = isValidName(course);

if(!isvalid) cout << "Invalid Name...! Try Again." << endl;

}while(!isvalid);

}

void student::printrec()

{

cout << endl << "Name = " << stud\_name

<< endl << "Roll no = " << rollno

<< endl << "Course = " << course;

}

void exam::getmarks()

{

do{

cout << "Enter " << getname() << "'s marks in History ( 0 <= M <= 100 ): ";

cin >> marks1;

if(marks1 < 0 || marks1 > 100) cout << "Invalid input...! Try again" << endl;

}while(marks1 < 0 || marks1 > 100);

do{

cout << "Enter " << getname() << "'s marks in Political Science ( 0 <= M <= 100 ): ";

cin >> marks2;

if(marks2 < 0 || marks2 > 100) cout << "Invalid input...! Try again" << endl;

}while(marks2 < 0 || marks2 > 100);

do{

cout << "Enter " << getname() << "'s marks in Urdu ( 0 <= M <= 100 ): ";

cin >> marks3;

if(marks3 < 0 || marks3 > 100) cout << "Invalid input...! Try again" << endl;

}while(marks3 < 0 || marks3 > 100);

}

void exam::printresult()

{

cout << endl << "OPPS Marks : " << marks1

<< endl << "DBMS Marks : " << marks2

<< endl << "Advance data structure marks : " << marks3;

}

int main()

{

int n;

do{

cout << endl << "Enter no. of students : ";

cin >> n;

if( n < 1) cout << "Invalid input...! Try again." << endl;

}while(n < 1);

exam s[n];

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

{

s[i].input\_student(i + 1 );

s[i].input\_marks();

cout << endl;

}

cout << endl << "Student Details :";

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

{

s[i].display\_student();

s[i].display\_marks();

cout << endl;

}

return 0;

}

**3. Write a program to implement the member functions of a Class Shape having the same name, calculate\_area() for calculating the area of a Triangle, Rectangle and Circle using the concept of Function overloading.**

#include<iostream>

using namespace std;

class shape{

public:

virtual void area(){};

virtual void display(){};

};

class circle:public shape{

double radius;

public:

void getdata();

void display();

void area();

};

class rectangle:public shape{

double width, length;

public:

void getdata();

void display();

void area();

};

class triangle:public shape{

double base, height;

public:

void getdata();

void display();

void area();

};

void circle::getdata()

{

cout << endl << "Enter radius of circle : ";

cin >> radius;

}

void circle::display()

{

cout << endl << endl << "Shape : Circle" << endl << "Radius: " << radius;

}

void circle::area()

{

cout << endl << "Area : " << 3.14159 \* radius \* radius;

}

void rectangle::getdata()

{

cout << endl << "Enter width of Rectangle : ";

cin >> width;

cout << "Enter lenght of Rectangle : ";

cin >> length;

}

void rectangle::display()

{

cout << endl << endl << "Shape : Rectangle" << endl << "Width : " << width << endl << "Lenght: " << length;

}

void rectangle::area()

{

cout << endl << "Area : " << width \* length;

}

void triangle::getdata()

{

cout << endl << "Enter triangle base : : ";

cin >> base;

cout << "Enter height : ";

cin >> height;

}

void triangle::display()

{

cout << endl << "Shape : Trianlge" << endl << "Base : " << base << endl << "Height :"<< height <<endl;

}

void triangle::area()

{

cout << endl << "Area : " << ((base \*height) / 2);

}

int main()

{

shape\* p;

circle c;

rectangle r;

triangle t;

p = &c;

c.getdata();

p = &r;

r.getdata();

p = &t;

t.getdata();

p = &c;

p->display();

p->area();

p = &r;

p->display();

p->area();

p = &t;

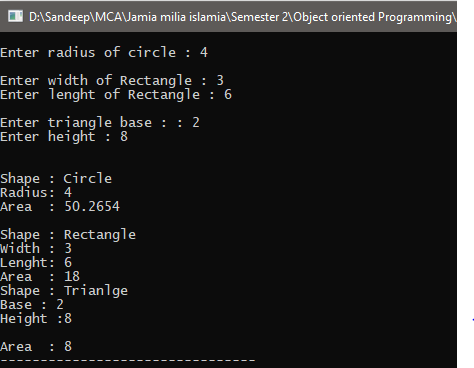
p->display();

p->area();

return 0;

}

**OUTPUT:**



**4. Write a program to convert a distance entered in Feet and Inches to Meters using class to basic data type conversion.**

#include<iostream>

#include<iomanip>

using namespace std;

class dist{

int inches;

int feets;

public:

void getdata();

float getInches(){ return inches; };

float getFeets(){ return feets; }

operator float()

{

float totalFeets;

totalFeets = feets + inches\*1/12;

return totalFeets\*1/3.28;

}

};

void dist::getdata()

{

cout << endl << "Enter distance in inches : ";

cin >> inches;

cout << "Enter distance in feets : ";

cin >> feets;

}

int main()

{

dist d;

float m;

d.getdata();

m = d;

cout << endl << "Meters(" << d.getFeets() << " F + " << d.getInches() << " I) = " << m;

return 0;

}

OUTPUT:

