**Program 1:**

#include<iostream>

using namespace std;

class students //single base class

{

protected: int roll\_no;

public:

void get\_roll(int a) {

roll\_no=a;

}

void display() {

cout<<"Roll No = "<<roll\_no<<endl;

}

};

class arts : public students //arts is derived from class base

{

protected: int h\_marks;

public:

void history\_marks(int b) {

h\_marks=b;

cout<<"History Marks = "<<h\_marks<<endl;

}

};

class engineering : public students //engineering is also derived from class base

{

protected: int m\_marks;

public:

void maths\_marks(int b) {

m\_marks=b;

cout<<"Maths Marks = "<<m\_marks<<endl;

}

};

class medical : public students //medical is also derived from class base

{

protected: int a\_marks;

public:

void anatomy\_marks(int c) {

a\_marks=c;

cout<<"Anatomy Marks = "<<a\_marks<<endl;

}

};

class mech : public engineering //mech is derived from class base engineering

{

protected: int t\_marks;

public:

void thermodynamics\_marks(int d) {

t\_marks=d;

cout<<"Thermodynamics Marks = "<<t\_marks<<endl;

}

};

class elec : public engineering //elec is also derived from class base engineering

{

protected: int e\_marks;

public:

void circuit\_marks(int e) {

e\_marks=e;

cout<<"Circuit Marks = "<<e\_marks<<endl;

}

};

class civil : public engineering //civil is also derived from class base engineering

{

protected: int c\_marks;

public:

void construction\_marks(int f) {

c\_marks=f;

cout<<"Construction Marks = "<<c\_marks<<endl;

}

};

int main()

{

arts s1;

medical s2;

mech s3;

elec s4;

civil s5;

s1.get\_roll(21);

s2.get\_roll(22);

s3.get\_roll(23);

s4.get\_roll(24);

s5.get\_roll(25);

s1.history\_marks(78);

s2.anatomy\_marks(98);

s3.maths\_marks(85);

s4.maths\_marks(92);

s5.maths\_marks(72);

s3.thermodynamics\_marks(66);

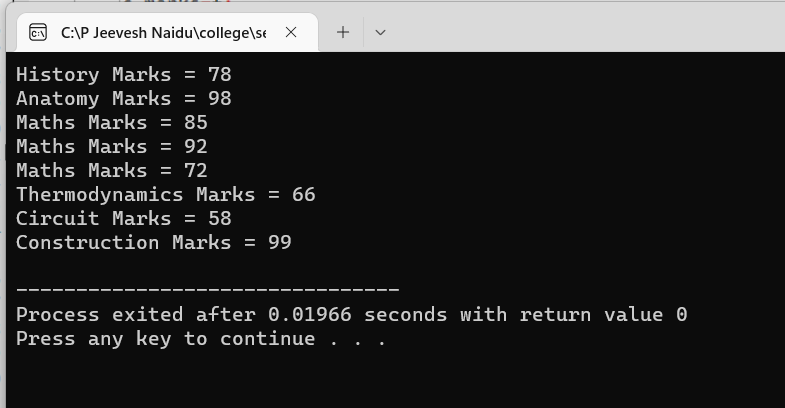
s4.circuit\_marks(58);

s5.construction\_marks(99);

return 0;

}

**Output:**



**Program 2:**

#include<iostream>

using namespace std;

class student {

int roll\_no;

public:

void get\_roll(int p) {

roll\_no=p;

cout<<"Roll No = "<<roll\_no<<endl;

}

};

class test: public virtual student {

protected:

int t1,t2;

public:

void get\_tmarks(int q, int r) {

t1=q;

t2=r;

cout<<"Marks 1 = "<<t1<<endl<<"Marks 2 = "<<t2<<endl;

}

};

class sports: public virtual student {

protected:

int s;

public:

void get\_smarks(int v) {

s=v;

cout<<"Sports Marks = "<<s<<endl;

}

};

class result: public test,public sports {

private:

int total;

public:

void display() {

total=t1+t2+s;

cout<<"Total Marks = "<<total<<endl;

}

};

int main() {

result r;

r.get\_roll(10);

r.get\_tmarks(100,92);

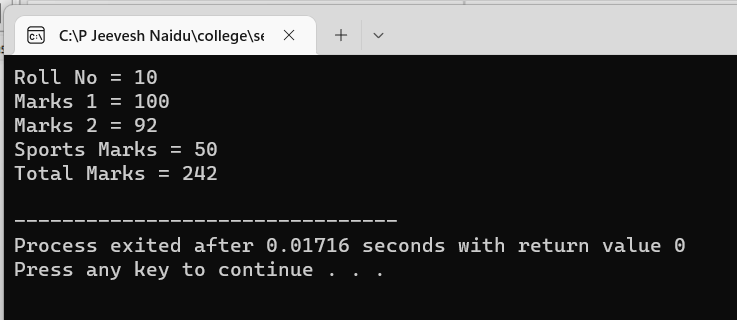
r.get\_smarks(50);

r.display();

return 0;

}

**Output:**



**Program 3:**

#include<iostream>

using namespace std;

class alpha {

int x;

public:

alpha(int i) {

x=i;

cout<<"Alpha Initialised "<<endl;

}

void show\_x() {

cout<<x<<endl;

}

};

class beta {

float y;

public:

beta(float j) {

y=j;

cout<<"Beta initialised "<<endl;

}

void show\_y() {

cout<<y<<endl;

}

};

class gamma: public beta, public alpha {

int m,n;

public:

gamma(int a, float b, int c, int d): alpha(a),beta(b) {

m=c;

n=d;

cout<<"Gamma initialised"<<endl;

}

void show\_mn() {

cout<<m<<" and "<<n<<endl;

}

};

int main() {

gamma g(5,10.5,20,30);

g.show\_x();

g.show\_y();

g.show\_mn();

return 0;

}

**Output:**

