Practical-1

- **Write a cpp program which explains the use of a scope resolution operator.**

```
#include<conio.h>
#include<iostream.h>
int a=30,b=40;

int main()
{
        int a=10,b=20;
        clrscr();

        cout<<"The ans is==>"<<::a+::b;
        getch();
}
```

Practical-2

- **Write a cpp program which explains the use of a manipulators operator.**

```
#include<conio.h>
#include<iostream.h>
#include<iomanip.h>

main()
{
        int a=25;
        clrscr();
        cout<<"Hello....."<<endl;
        cout<<"World"<<setw(10)<<a;
```

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```
        getch();
        return 0;
}
```

Practical-3

- **Write a cpp program which explain the use of reference variable.**

```
#include<conio.h>
#include<stdio.h>
#include<iostream.h>

main()
{
        clrscr();

        int a=20,*c;
        int &b=a;
        c=&a;

        cout<<a<<endl;
        cout<<b<<endl;
        cout<<c<<endl;

        a=a+30;

        cout<<a<<endl;
        cout<<b<<endl;
        cout<<c;

        getch();
```

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```
        return 0;
}
```

Practical-4

- **Write a cpp program which explains the feature of a inline function.**

```
#include<conio.h>
#include<iostream.h>

inline int temp(int a,int b)
{
        return(a*b);
}

main()
{
        int a=30,b=30;
        clrscr();
        cout<<"\n a*b="<<temp(a,b);

        getch();
        return 0;
}
```

Practical-5

- **Write a cpp program which explains the concept of default arguments.**

```
#include<conio.h>
#include<iostream.h>
```

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```
int temp(int a,int b=15);
int main()
{
        clrscr();

        temp(10);

        getch();
        return 0;
}
int temp(int a,int b)
{
        cout<<"A ="<<a<<endl;
        cout<<"B ="<<b;
}
```

Practical-6

- **Write a cpp program for function overloading.**

```
#include<conio.h>
#include<iostream.h>

int volume(int a,int b);
int volume(int a,int b,int c);

main()
{
        int x,y;

        clrscr();

        x=volume(10,20);
        y=volume(10,20,30);
```

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```
        cout<<"\n\n multipliction="<<x;
        cout<<"\n\n sum="<<y;

        getch();
        return 0;
}
int volume(int a,int b)
{
        return(a*b);
}
int volume(int a, int b, int c)
{
        return(a+b+c);
}
```

Practical-7

- **Write a cpp program for arrays within a class. (How to use a array in a class).**

```
#include<conio.h>
#include<iostream.h>

class student
{
        int a[10];
    public:
        void getdata();
        void putdata();
};
void student :: getdata()
{
        for(int i=0;i<5;i++)
        {
                cout<<"enter value:"<<i+1<<"=";
```

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```
                cin>>a[i];
        }
}
void student :: putdata()
{
        for(int i=0;i<5;i++)
        {
                cout<<"\n"<<a[i];
        }
}
int main()
{
        clrscr();

        student d;
        d.getdata();
        d.putdata();

        getch();
        return 0;
}
```

Practical-8

- **Write a cpp program for static class member. (Class member should be a static variable)**

```
#include<conio.h>
#include<iostream.h>

class item
{
        static int count;
        int number;
    public:
```

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```
        void getdata(int a)
        {
                number=a;
                count ++;
        }
        void getcount(void)
        {
                cout<<"count:";
                cout<<count<<endl;
        }
};
int item :: count;
int main()
{
        clrscr();
        item a,b,c;

        a.getcount();
        b.getcount();
        c.getcount();

        a.getdata(100);
        b.getdata(200);
        c.getdata(300);

        cout<<"\n AFTER READING DATA\n"<<endl;

        a.getcount();
        b.getcount();
        c.getcount();

        getch();
        return 0;
}
```

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Practical-9

- **Write a cpp program which shows use of "static member function".**

```
#include<conio.h>
#include<iostream.h>

class test
{
        int code;
        static int count;
    public:
        void setcode(void)
        {
                code=++count;
        }
        void showcode(void)
        {
                cout<<"object number="<<code<<endl;
        }
        static void showcount(void)
        {
                cout<<"count="<<count<<endl;
        }
};
int test :: count;
int main()
{
        test t1,t2;
        clrscr();

        t1.setcode();
        t2.setcode();

        test :: showcount();
```

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```
        test t3;
        t3.setcode();

        test :: showcount();

        t1.showcode();
        t2.showcode();

        t3.showcode();

        getch();
        return 0;
}
```

Practical-10

- **Write a cpp program which explain concept of a "array of object".**

```
#include<conio.h>
#include<iostream.h>

class employee
{
        char name[20];
        float age;
    public:
        void getdata(void);
        void putdata(void);
};
void employee :: getdata(void)
{
        cout<<"enter name==>";
        cin>>name;
```

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```
        cout<<"enter age==>";
        cin>>age;
}
void employee :: putdata(void)
{
        cout<<"\tname=:"<<name<<endl;
        cout<<"\tage=:"<<age<endl;
}
const int size=2;
int main()
{
        int i;
        clrscr();
        employee manager[size];
        for(i=0;i<size;i++)
        {
                cout<<"details of manager:"<<i+1<<endl;
                manager[i].getdata();
        }
        cout<<"\n";
        for(i=0;i<size;i++)
        {
                cout<<"\n\n\tmanager:"<<i+1<<endl;
                manager[i].putdata();
        }
        getch();
        return 0;
}
```

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Practical-11

- **Write a cpp program which explain concept of "object as a arguments".**

```
#include<conio.h>
#include<iostream.h>

class sum
{
        int n1,n2;
    public:
        void getdata(int a,int b)
        {
                n1=a;
                n2=b;
        }
        void putdata()
        {
                cout<<"Number-1:"<<n1;
                cout<<"  Number-2:"<<n2;
        }
        void add(sum,sum);
};
void sum :: add(sum s1,sum s2)
{
        n1=s1.n1+s2.n1;
        n2=s1.n2+s2.n2;
}
int main()
{
        sum s1,s2,s3;
        clrscr();

        s1.getdata(10,20);
        s2.getdata(30,40);
```

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```
        s3.add(s1,s2);

        cout<<"\n\n s1=";
        s1.putdata();
        cout<<"\n\n s2=";
        s2.putdata();
        cout<<"\n\n s3=";
        s3.putdata();

        getch();
        return 0;
}
```

Practical-12

- **Write a cpp program for a friend function.**

```
#include<conio.h>
#include<iostream.h>

class sample
{
        int a,b;
  public:
        void getdata()
        {
                a=10;
                b=20;
        }
        friend float mean(sample s);
};
float mean(sample s)
{
        return float(s.a+s.b)/2.0;
```

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```
}
int main()
{
        sample x;
        clrscr();
        x.getdata();
        cout<<"mean value:"<<mean(x)<<"\n";
        getch();
        return 0;
}
```

Practical-13

- **Write a cpp program for a function friendly to two classes.**

```
#include<conio.h>
#include<iostream.h>

class abc;
class xyz
{
        int x;
    public:
        void setvalue(int i)
        {
                x=i;
        }
        friend void max(xyz,abc);
};
class abc
{
        int a;
```

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```
    public:
        void setvalue(int i)
        {
                a=i;
        }
        friend void max(xyz,abc);
};
void max(xyz m,abc n)
{
        if(m.x>=n.a)
          cout<<"max value-m.x:"<<m.x;
        else
          cout<<"max value-n.a:"<<n.a;
}
int main()
{
        clrscr();

        abc p;
        p.setvalue(10);
        xyz q;
        q.setvalue(20);
        max(q,p);

        getch();
        return 0;
}
```

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Practical-14

- **Write a cpp program of a swapping private data of classes.**

```
#include<conio.h>
#include<iostream.h>
```


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```
class  class_2;
class class_1
{
        int value1;
    public:
        void indata(int a)
        {
                value1=a;
        }
        void display()
        {
                cout<<value1<<"\n";
        }
        friend void exchange(class_1 &,class_2 &);
};
class class_2
{
        int value2;
    public:
        void indata(int a)
        {
                value2=a;
        }
        void display()
        {
                cout<<value2<<"\n";
        }
        friend void exchange(class_1 &,class_2 &);
};
void exchange(class_1 &x,class_2 &y)
{
        int temp=x.value1;
        x.value1=y.value2;
        y.value2=temp;
```

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```
}
int main()
{
        clrscr();
        class_1 c1;
        class_2 c2;

        c1.indata(100);
        c2.indata(200);

        cout<<"-----value before exchange-----"<<"\n";

        c1.display();
        c2.display();

        exchange(c1,c2);

        cout<<"-----value after exchange-----"<<"\n";

        c1.display();
        c2.display();

        getch();
        return 0;
}
```

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Practical-15

- **Write a cpp program which explain concept of a returning objects.**

```
#include<conio.h>
#include<iostream.h>
```


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```
class complex
{
        float x,y;
    public:
        void input(float real,float image)
        {
                x=real;
                y=image;
        }
        friend complex sum(complex,complex);
        void show(complex);
};
complex sum(complex c1,complex c2)
{
        complex c3;
        c3.x=c1.x+c2.x;
        c3.y=c1.y+c2.y;
        return (c3);
}
void complex :: show(complex d)
{
        cout<<d.x<<" "<<d.y<<endl;
}
int main()
{
        complex p,q,r;
        clrscr();

        p.input(3.1,5.65);
        q.input(2.75,1.2);
        r=sum(p,q);

        cout<<"p= ";
        p.show(p);
```

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```
        cout<<"q= ";
        q.show(q);

        cout<<"r= ";
        r.show(r);

        getch();
        return 0;
}
```

Practical-16

- **Write a cpp program for class with constructors.**

```
#include<conio.h>
#include<iostream.h>

class add
{
        int a,d,p;
    public:
        void display()
        {
                cout<<"\n\n A:"<<a<<"\n";
                cout<<"\n\n D:"<<d<<"\n";
                cout<<"\n\n SUM:"<<p<<"\n";
        }
        add(int,int);
};
add :: add(int x,int y)
{
        a=x;
        d=y;
        p=a+d;
```

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```
}
int main()
{
        clrscr();
        add c(10,5);
        c.display();

        getch();
        return 0;
}
```

Practical-17

- **Write a cpp program for overloaded constructors.**

```
#include<conio.h>
#include<iostream.h>

class add
{
        int a,b,p,n;
    public:
        void display()
        {
                cout<<"\n A:"<<a<<"\n";
                cout<<"\n B:"<<b<<"\n";
                cout<<"\n SUM:"<<p<<"\n";
        }
        add(int,int);
        add(int);
};
add :: add(int x,int y)
{
        a=x;
        b=y;
        p=a+b;
```

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```
}
add :: add(int n)
{
        a=n;
        p=n+10;
}
int main()
{
        clrscr();
        add d(10,10);
        add k(25);

        cout<<"\n*****-| for object of A |-*****\n"<<"\n";
        d.display();
        cout<<"\n*****-| for object of B |-*****\n"<<"\n";
        k.display();

        getch();
        return 0;
}
```

Practical-18

- **Write a cpp program of copy constructors.**

```
#include<conio.h>
#include<iostream.h>

class add
{
        int a,b,c;
    public:
        void display()
        {
```

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```
                cout<<"\n\n  SUM:"<<c<<"\n";
        }
        add(int,int);
        add(add &p)
        {
                c=5+p.a+p.b;
        }
};
add :: add(int x,int y)
{
        a=x;
        b=y;
        c=a+b;
}
int main()
{
        clrscr();
        add p(5,20);
        add q(p);

        cout<<"\n\n*****-| for object of A |-*****\n"<<"\n";
        p.display();
        cout<<"\n\n*****-| for object of B |-*****\n"<<"\n";
        q.display();

        getch();
        return 0;
}
```

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Practical-19

- **Write a cpp program of a constructing matrix objects.**

```
#include<conio.h>
#include<iostream.h>

class matrix
{
        int **p;
        int d1,d2;
        public:
        matrix(int x,int y)
        {
                d1=x;
                d2=y;
                p=new int *[d1];
                for(int i=0;i<d1;i++)
                {
                        p[i]=new int[d2];
                }
        }
        void getele(int i,int j,int val)
        {
                p[i][j]=val;
        }
        int &putele(int i,int j)
        {
                return p[i][j];
        }
};
int main()
{
        int m,n,i,j,value;
        clrscr();
```

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```
        cout<<"enter the size of matrix";
        cin>>m;
        cin>>n;

        matrix a(m,n);

        cout<<"\n enter element row by row : ";

        for(i=0;i<m;i++)
                for(j=0;j<n;j++)
                {
                        cin>>value;
                        a.getele(i,j,value);
                }
                cout<<"\n";
        for(i=0;i<m;i++)
        {
                for(j=0;j<n;j++)
                {
                        cout<<a.putele(i,j)<<" ";
                }
                cout<<"\n";
        }
        getch();
        return 0;
}
```

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Practical-20

❖ **Write a cpp program of implementation of destructors.**

```
#include<conio.h>
#include<iostream.h>

int count=0;
class test
{
    public:
       test()
       {
              count++;
              cout<<"\n no of object created....."<<count;
       }
       ~test()
       {
              cout<<"\n no of object destroyed....."<<count;
              count--;
       }
};
int main()
{
       clrscr();

       cout<<"\n\n enter in main section.....\n";
       test t1,t2;
       {
        cout<<"\n\n enter in Block-2\n";
        test t3,t4;
       }
       {
        cout<<"\n\n Re-enter in Block-2\n";
        test t5;
```

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```
        }
         cout<<"\n\n Back inside the main Block\n";

         getch();
         return 0;
}
```

Practical-21

- **Write a cpp program for implementation of unary minus operator.**

```
#include<conio.h>
#include<iostream.h>

class space
{
        int x,y,z;
    public:
        void getdata(int p,int q,int r)
        {
                x=p;
                y=q;
                z=r;
        }
        void display()
        {
                cout<<"\n A:"<<x<<endl;
                cout<<"\n B:"<<y<<endl;
                cout<<"\n C:"<<z<<endl;
        }
        void operator-();
};
void space :: operator-()
{
```

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```
        x=-x;
        y=-y;
        z=-z;
}
int main()
{
        clrscr();

        space r;
        r.getdata(10,5,-3);
        cout<<"\n\n Original value : "<<endl;
        r.display();

        -r;
        cout<<"\n\n After change : "<<endl;
        r.display();

        getch();
        return 0;
}
```

Practical-22

- **Write a cpp program for implementation of binary plus (+) operator.**

```
#include<conio.h>
#include<iostream.h>

class complex
{
        int a,b;
    public:
        complex()
```

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```
        {
        }
        complex(int x,int y)
        {
         a=x;
         b=y;
        }
        complex operator+(complex);
        void display()
        {
         cout<<a<<"+"<<b<<endl;
        }
};
complex complex :: operator+ (complex c)
{
        complex temp;
        temp.a=a+c.a;
        temp.b=b+c.b;
        return(temp);
}
int main()
{
        clrscr();

        complex c1(10,5);
        complex c2(15,12);
        complex c3=c1+c2;

        cout<<"\n\n c1: ";
        c1.display();

        cout<<"\n\n c2: ";
        c2.display();

        cout<<"\n\n c3: ";
```

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```
        c3.display();

        getch();
        return 0;
}
```

Practical-23

- **Write a cpp program for implementation of overloading operators using friends function.**

```
#include<conio.h>
#include<iostream.h>

class vector
{
        int v[size];
        public:
        vector();
        vector(int *x);
        friend vector operator *(int a,vector b);
        friend vector operator *(vector b,int a);
        friend istream & operator >>(istream &,vector &);
        friend ostream & operator <<(ostream &,vector &);
};
vector :: vector()
{
        for(int i=0;i<size;i++)
        v[i]=0;
}
vector :: vector(int *x)
{
        for(int i=0;i<size;i++)
        v[i]=x[i];
```

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```
}
vector operator *(int a,vector b)
{
        vector c;
        for(int i=0;i<size;i++)
        c.v[i]=a*b.v[i];
        return c;
}
vector operator *(vector b,int a)
{
        vector c;
        for(int i=0;i<size;i++)
        c.v[i]=b.v[i]*a;
        return c;
}
istream & operator >>(istream &din,vector &b)
{
        for(int i=0;i<size;i++)
        din>>b.v[i];
        return(din);
}
ostream & operator <<(ostream &dout,vector &b)
{
        dout<<"c"<<b.v[0];
        for(int i=1;i<size;i++)
        dout<<","<<b.v[i];
        dout<<",";
        return(dout);
}
int x[size]={2,4,6};
int main()
{
        clrscr();
        vector m;
        vector n=x;
```

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```
        cout<<"enter elements of vector m"<<"\n";
        cin>>m;
        cout<<"\n";
        cout<<"m="<<m<<"\n";

        vector p,q;

        p=2*m;
        q=n*2;

        cout<<"\n";
        cout<<"p="<<p<<"\n";
        cout<<"q="<<q<<"\n";

        return 0;
}
```

Practical-24

- **Write a cpp program for implementation of mathematical operations on strings. {Overloads two operators + and <=}**

```
#include<conio.h>
#include<iostream.h>
#include<string.h>

class string
{
        char *p;
        int len;
```

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```
        public:
        string()
        {
                len=0;
                p=0;
        }
        string(const char *s);
        string(const string &s);
        ~string()
        {
                delete p;
        }
        friend string operator +(const string &s,const string &t);
        friend int operator <=(const string &s,const string &t);
        friend void show(const string s);
};
string :: string(const char *s)
{
        len=strlen(s);
        p=new char[len+1];
        strcpy(p,s);
}
string :: string(const string &s)
{
        len=s.len;
        p=new char[len+1];
        strcpy(p,s.p);
}
string operator +(const string &s,const string &t)
{
        string temp;
        temp.len=s.len+t.len;
        temp.p=new char[temp.len+1];
        strcpy(temp.p,s.p);
        strcat(temp.p,t.p);
```

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```
        return(temp);
}
int operator <=(const string &s,const string &t)
{
        int m=strlen(s.p);
        int n=strlen(t.p);

        if(m<=n)
                return(1);
        else
                return(0);
}
void show(const string s)
{
        cout<<s.p;
}
int main()
{
        clrscr();

        string s1="New";
        string s2="York";
        string s3="Delhi";

        string t1,t2,t3;
        t1=s1;
        t2=s2;
        t3=s1+s3;

        cout<<"\n T1=";
        show(t1);
        cout<<"\n T2=";
        show(t2);
        cout<<"\n T3=";
```

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```
        show(t3);
        cout<<"\n\n";

        if(t1<=t3)
        {
                show(t1);
                cout<<" Smaller Than ";
                show(t3);
                cout<<"\n";
        }
        else
        {
                show(t3);
                cout<<" Smaller Than ";
                show(t1);
                cout<<"\n";
        }
         getch();
         return 0;
}
```

Practical-25

- **Write a cpp program for implementation of a single inheritance of public data member.**

```
#include<conio.h>
#include<iostream.h>

class B
{
        int a;
    public:
        int b;
```

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```
        void set_ab();
        int get_a();
        void show_a();
};
class D : public B
{
        int c;
    public:
        void mul();
        void display();
};
void B :: set_ab()
{
        a=5;
        b=10;
}
int B :: get_a()
{
        return a;
}
void B :: show_a()
{
        cout<<"A="<<a<<"\n";
}
void D :: mul()
{
        c=b*get_a();
}
void D :: display()
{
        cout<<"A="<<get_a()<<"\n";
        cout<<"B="<<b<<"\n";
        cout<<"C="<<c<<"\n\n";
}
int main()
```

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```
{
        clrscr();

        D d;

        d.set_ab();
        d.mul();
        d.show_a();
        d.display();

        d.b=20;
        d.mul();
        d.display();

        return 0;
        getch();
}
```

Practical-26

- **Write a cpp program for implementation of a single inheritance of private data member.**

```
#include<conio.h>
#include<iostream.h>

class B
{
        int a;
    public:
        int b;
```

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```
        void get_ab();
        int get_a();
        void show_a();
};
class D : private B
{
        int c;
    public:
        void mul(void);
        void display(void);
};
void B :: get_ab(void)
{
        cout<<"enter values for a and b : ";
        cin>>a>>b;
}
int B :: get_a()
{
        return a;
}
void B :: show_a()
{
        cout<<"A="<<a<<"\n";
}
void D :: mul()
{
        get_ab();
        c=b*get_a();
}
void D :: display()
{
        show_a();
        cout<<"B="<<b<<"\n"<<"C="<<c<<"\n\n";
}
int main()
```

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```
{
        clrscr();

        D d;

        d.mul();
        d.display();

        d.mul();
        d.display();

        return 0;
        getch();
}
```

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Practical-27

- **Write a cpp program of multilevel inheritance.**

```
#include<conio.h>
#include<iostream.h>

class student
{
        protected:
         int roll_num;
        public:
         void get_num(int);
```


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```
        void put_num(void);
};
void student :: get_num(int a)
{
        roll_num=a;
}
void student :: put_num()
{
        cout<<"Roll Number : "<<roll_num<<"\n";
}
class test : public student
{
        protected:
         float sub1;
         float sub2;
        public:
         void get_marks(float,float);
         void put_marks(void);
};
void test :: get_marks(float x,float y)
{
        sub1=x;
        sub2=y;
}
void test :: put_marks()
{
    cout<<"Marks in sub1 = "<<sub1<<"\n";
        cout<<"Marks in sub2 = "<<sub2<<"\n";
}
class result : public test
{
         float total;
        public:
         void display(void);
};
```

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```
void result :: display(void)
{
        total=sub1+sub2;
        put_num();
        put_marks();
        cout<<"Total = "<<total<<"\n";
}
int main()
{
        clrscr();

        result student1;

        student1.get_num(40);

        student1.get_marks(75.0,59.5);

        student1.display();

        return 0;
}
```

Practical-28

- **Write a cpp program of multiple inheritances.**

```
#include<conio.h>
#include<iostream.h>

class M
{
        protected:
         int m;
        public:
         void get_m(int);
```

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```
};
class N
{
        protected:
         int n;
        public:
         void get_n(int);
};
class P : public M,public N
{
        public:
         void display(void);
};
void M :: get_m(int x)
{
        m=x;
}
void N :: get_n(int y)
{
        n=y;
}
void P :: display(void)
{
        cout<<"M = "<<m<<"\n";
        cout<<"N = "<<n<<"\n";
        cout<<"M*N = "<<m*n<<"\n";
}
int main()
{
        clrscr();

        P p;

        p.get_m(10);
        p.get_n(15);
```

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```
        p.display();

        return 0;
}
```

Practical-28

- **Write a cpp program of multiple inheritances.**

```
#include<conio.h>
#include<iostream.h>

class M
{
        protected:
         int m;
        public:
         void get_m(int);
};
class N
{
        protected:
         int n;
        public:
         void get_n(int);
};
class P : public M,public N
{
        public:
         void display(void);
};
void M :: get_m(int x)
{
        m=x;
```

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```
}
void N :: get_n(int y)
{
        n=y;
}
void P :: display(void)
{
        cout<<"M = "<<m<<"\n";
        cout<<"N = "<<n<<"\n";
        cout<<"M*N = "<<m*n<<"\n";
}
int main()
{
        clrscr();

        P p;

        p.get_m(10);
        p.get_n(15);
        p.display();

        return 0;
}
```

Practical-29

- **Write a cpp program of hybrid inheritance.**

```
#include<conio.h>
#include<iostream.h>

class student
{
        protected:
```

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```
        int roll_num;
       public:
        void get_num(int a)
        {
         roll_num=a;
        }
        void put_num(void)
        {
         cout<<"Roll No:"<<roll_num<<"\n";
        }
};
class test : public student
{
       protected:
        float part1,part2;
       public:
        void get_marks(float x,float y)
        {
         part1=x;
         part2=y;
        }
        void put_marks(void)
        {
         cout<<"Marks obtained: "<<"\n";
         cout<<"part1= "<<part1<<"\n";
         cout<<"part2= "<<part2<<"\n";
        }
};
class sports
{
       protected:
        float score;
       public:
       void get_score(float s)
       {
```

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```
                score=s;
        }
        void put_score(void)
        {
                cout<<"Sports wt= "<<score<<"\n\n";
        }
};
class result : public test,public sports
{
         float total;
        public:
         void display(void);
};
void result :: display(void)
{
        total=part1+part2+score;

        put_num();
        put_marks();
        put_score();

        cout<<"Total Score= "<<total<<"\n";
}
int main()
{
        clrscr();

        result student1;

        student1.get_num(40);
        student1.get_marks(27.5,33.0);
        student1.get_score(6.0);
        student1.display();

        return 0;
```

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```
}
```

Practical-30

- **Write a cpp program of virtual base class.**

```
#include<conio.h>
#include<iostream.h>

class student
{
        protected:
         int roll_num;
        public:
         void get_num(int a)
         {
          roll_num=a;
         }
         void put_num(void)
         {
          cout<<"Roll No: "<<roll_num<<"\n";
         }
};
class test : virtual public student
{
        protected:
         float part1,part2;
        public:
         void get_marks(float x,float y)
         {
          part1=x;
          part2=y;
         }
         void put_marks(void)
```

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```
        {
         cout<<"Marks obtained: "<<"\n";
         cout<<"part1= "<<part1<<"\n";
         cout<<"part2= "<<part2<<"\n";
        }
};
class sports : public virtual student
{
        protected:
         float score;
        public:
        void get_score(float s)
        {
                score=s;
        }
        void put_score(void)
        {
                cout<<"Sports wt= "<<score<<"\n\n";
        }
};
class result : public test,public sports
{
         float total;
        public:
         void display(void);
};
void result :: display(void)
{
        total=part1+part2+score;

        put_num();
        put_marks();
        put_score();

        cout<<"Total Score= "<<total<<"\n";
```

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```
}
int main()
{
        clrscr();

        result student1;

        student1.get_num(40);
        student1.get_marks(30.5,25.5);
        student1.get_score(7.0);
        student1.display();

        return 0;
}
```

Practical-31

- **Write a cpp program in which use constructors in derived class.**

```
#include<conio.h>
#include<iostream.h>

class alpha
{
        int x;
        public:
        alpha(int i)
```

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```
        {
                x=i;
        }
        void show_x(void)
        {
                cout<<"X="<<x<<"\n";
        }
};
class beta
{
        float y;
       public:
        beta(float j)
        {
                y=j;
        }
        void show_y(void)
        {
                cout<<"Y="<<y<<"\n";
        }
};
class gama : public beta,public alpha
{
        int m,n;
       public:
        gama(int a,float b,int c,int d):alpha(a),beta(b)
        {
                m=c;
                n=d;
        }
        void show_mn(void)
        {
                cout<<"M="<<m<<"\n";
                cout<<"N="<<n<<"\n";
        }
```

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```
};
int main()
{
        clrscr();

        gama g(15,12.25,7,25);
        cout<<"\n";

        g.show_x();
        g.show_y();
        g.show_mn();

        return 0;
}
```

Practical-32

- **Write a cpp program of initialization list in constructors.**

```
#include<conio.h>
#include<iostream.h>

class alpha
{
        int x;
        public:
        alpha(int i)
        {
```

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```
                x=i;
                cout<<"\n alpha constructor";
        }
        void show_alpha(void)
        {
                cout<<"X="<<x<<"\n";
        }
};
class beta
{
        float p,q;
        public:
        beta(float a,float b):p(a),q(b+p)
        {
                cout<<"\n beta constructor";
        }
        void show_beta(void)
        {
                cout<<"P="<<p<<"\n";
                cout<<"Q="<<q<<"\n";
        }
};
class gama : public beta,public alpha
{
        int m,n;
        public:
        gama(int a,int b,float c):alpha(a*2),beta(c,c),m(a)
        {
                n=b;
                cout<<"\n gama constructor";
        }
        void show_gama(void)
        {
                cout<<"M="<<m<<"\n";
                cout<<"N="<<n<<"\n";
```

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```
        }
};
int main()
{
        gama g(2,4,2.5);

        clrscr();

        cout<<"\n\n Display member values"<<"\n\n";

        g.show_alpha();
        g.show_beta();
        g.show_gama();

        return 0;
}
```

Practical-33

- **Write a cpp program for implementation of pointers to objects.**

```
#include<conio.h>
#include<iostream.h>

class item
{
        int code;
        float price;
        public:
```

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```
        void getdata(int a,float b)
        {
                code=a;
                price=b;
        }
        void show(void)
        {
                cout<<"code :"<<code<<"\n";
                cout<<"price :"<<price<<"\n";
        }
};
const int size=2;

int main()
{
        clrscr();
        item *p=new item[size];
        item *d=p;
        int x,i;
        float y;

        for(i=0;i<size;i++)
        {
                cout<<"Input code and price for item "<<i+1<<":";
                cin>>x>>y;
                p->getdata(x,y);
                p++;
        }
        for(i=0;i<size;i++)
        {
                cout<<"\n Item :"<<i+1<<"\n";
                d->show();
                d++;
        }
```

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```
        return 0;
}
```

Practical-34

- **Write a cpp program for implementation of array of pointer to objects.**

```
#include<conio.h>
#include<iostream.h>
#include<string.h>

class city
{
        protected:
        char *name;
        int len;
        public:
        city()
        {
                len=0;
                name=new char[len+1];
        }
        void getname(void)
        {
                char *s;
                s=new char[30];

                cout<<"\nenter city name : ";
                cin>>s;
                len=strlen(s);
                name=new char[len+1];
                strcpy(name,s);
        }
```

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```
        void printname(void)
        {
                cout<<name<<"\n";
        }
};
int main()
{
        city *cptr[10];
        int n=1;
        int option;
        clrscr();

        do
        {
                cptr[n]=new city;
                cptr[n]->getname();
                n++;
                cout<<"Do you want to enter one more name !\n";
                cout<<"(enter 1 for yes 0 for no):";
                cin>>option;
        }
        while(option);

        cout<<"\n\n";
        for(int i=1;i<=n;i++)
        {
                cptr[i]->printname();
        }

        return 0;
}
```

Practical-35

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❖ **Write a cpp program for implementation of this pointer.**

```
#include<conio.h>
#include<iostream.h>
#include<string.h>

class person
{
        char name[20];
        float age;
        public:
        person(char *s,float a)
        {
                strcpy(name,s);
                age=a;
        }
        person & person :: greater(person &x)
        {
                if(x.age>=age)
                        return x;
                else
                        return *this;
        }
        void display(void)
        {
                cout<<"Name : "<<name<<"\n";
                cout<<"Age : "<<age<<"\n";
        }
};
int main()
{
        person p1("Divya",37.50);
        person p2("Ahemdabad",29.0);
        person p3("Deepu",40.25);
```

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```
        clrscr();

        person p=p1.greater(p3);

        cout<<"\nElder person is :\n";
        p.display();

        p=p1.greater(p2);

        cout<<"\nElder person is :\n";
        p.display();

        return 0;
}
```

Practical-36

- **Write a cpp program for implementation of virtual function.**

```
#include<conio.h>
#include<iostream.h>

class base
{
        public:
        void display()
        {
```

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```
                cout<<"\n Display base ";
        }
        virtual void show()
        {
                cout<<"\n Show base ";
        }
};
class derived : public base
{
        public:
        void display()
        {
                cout<<"\n Display derived ";
        }
        void show()
        {
                cout<<"\n Show derived ";
        }
};
int main()
{
        clrscr();
        base b;
        derived d;
        base *bptr;

        cout<<"\n Bptr points to derived \n ";
        bptr=&b;
        bptr->display();
        bptr->show();

        cout<<"\n\n Bptr points to derived \n";
        bptr=&d;
        bptr->display();
        bptr->show();
```

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```
        return 0;
}
```

Practical-37

- **Write a cpp program which explains a concept of runtime polymorphism.**

```
#include<conio.h>
#include<iostream.h>
#include<string.h>

class media
{
        protected:
        char title[50];
        float price;
        public:
        media(char *s,float a)
        {
                strcpy(title,s);
                price=a;
        }
        virtual void display()
        {
        }
};
class book : public media
{
        int pages;
        public:
        book(char *s,float a,int p) : media(s,a)
        {
```

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```
                pages=p;
        }
        void display();
};
class tape : public media
{
        float time;
        public:
        tape(char *s,float a,float t) : media(s,a)
        {
                time=t;
        }
        void display();
};
void book :: display()
{
        cout<<"\n Title : "<<title;
        cout<<"\n Pages : "<<pages;
        cout<<"\n Price : "<<price;
}
void tape :: display()
{
        cout<<"\n Title : "<<title;
        cout<<"\n Play time : "<<time<<"mins";
        cout<<"\n Price : "<<price;
}
int main()
{
        clrscr();

        char *title=new char[30];
        float price,time;
        int pages;

        cout<<"\nEnter book details \n";
```

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```
        cout<<"Title :";
        cin>>title;
        cout<<"Price :";
        cin>>price;
        cout<<"Pages :";
        cin>>pages;

        book book1(title,price,pages);

        cout<<"\nEnter book details \n";
        cout<<"Title :";
        cin>>title;
        cout<<"Price :";
        cin>>price;
        cout<<"Play time (mins):";
        cin>>time;

        tape tape1(title,price,time);

        media *list[2];
        list[0]=&book1;
        list[1]=&tape1;

        cout<<"\nMedia Details \n";

        cout<<"\n.....Book.....\n";
        list[0]->display();

        cout<<"\n\n.....Tape.....\n";
        list[1]->display();

        return 0;
}
```

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