

• Static Data member and static function member

Static members are common for the entire class and not for each object of the class. We can have static data members as well as static function members.

- Q. Write a program to define a class having data members principal, duration & rate of interest declared rate of interest as static member variable. Calculate the simple interest & display it.

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

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

```
class interest
```

```
{
```

```
public :
```

```
int p, d;
```

```
float SI;
```

```
static float r;
```

```
void accept()
```

```
{
```

```
cout << "Enter principal duration";
```

```
cin >> p >> d;
```

```
}
```

```
void calculate()
```

```
{
```

$$SI = \frac{P \times d \times r}{100};$$

```

void display() {
    cout << "simple interest:" << s;
}
};
    
```

Float interest :: r = 15;

void main()

```

{
    interest i;
    i.accept();
    i.calculate();
    i.display();
}
    
```

* Compare static and non-static data members.

- | | |
|---|--|
| <p>① It is declared using static keyword.</p> <p>② static data member is automatically initialize with zero</p> <p>③ All object of a class share same copy of static data members</p> | <p>① It is declared without using static keyword.</p> <p>② Non-static data member can be initialize with zero or non-zero</p> <p>③ Each object of a class get its own copy of non-static data members.</p> |
|---|--|

⑭ It can be access Static member Function as well as Non static member Function of the class

⑮ It can be access only the non-static member function of the class.

⑯ Syntax :
Static datatype
Variable name ;

⑰ Syntax :
datatype Variable-name

⇒ Array of object
When multiple objects of a class are to be made we can use array of object.

Syntax :
class name object name [size];

Q. write a program to declare class staff having data members as name, dept, accept this data for 5 staff & display name and department of the staff.

```
#include <iostream.h>
#include <conio.h>
class staff
{
public:
char name[20], dept[20];
void accept()
{
```

```

cout << "Enter name & dept" ;
cin >> name >> dept ;
}

```

```

void display ()
{
cout << name << "\t" << dept ;
}
}

```

```

void main ()
{
Staff s[10];
int i;
for (i=0; i<=9; i++)
{
s[i].accept ();
}
for (i=0; i<=9; i++)
{
s[i].display ();
}
}
}

```

Q. Write a program to declare a class account having data member as account-no & balance accept and display data for 5 object using array of object.

```

-> #include <iostream.h>
#include <conio.h>
class Account
{

```

```
public :  
int account_no;  
float balance;
```

```
void accept()  
{  
cout << "Enter account no";  
cin >> account_no;  
cout << "Enter balance";  
cin >> balance;  
}
```

```
void display()  
{  
cout << "Account No:" << account_no;  
cout << "Balance:" << balance;  
}
```

```
void main()  
{  
Account a [5];  
int i;  
for (i=0; i<=4; i++)  
{  
a[i].accept();  
for (i=0; i<=4; i++)  
{  
a[i].display();  
}}
```

Q. write a program to declare class mobile having data members are price & model accept & display this data for 10 object.

```
#include <iostream.h>
#include <conio.h>
class mobile
{ public:
  char model [20];
  float price;
```

```
void accept()
{
  cout << "Enter model";
  cin >> model;
  cout << "Enter price";
  cin >> price;
}
```

```
void display()
{
  cout << "model is:" << model;
  cout << "price is:" << price;
}
};
```

```
void main()
{
  mobile m[10];
  int i;
```

```

for (i=0; i<=9; i++)
{
    m[i].accept();
}
for (i=0; i<=9; i++)
{
    m[i].display();
}
}

```

Q. Write a program to declare a class account with data members as account_no, name, and balance accept this data for 8 accounts & display details of account having balance less than 10,000

```

-> #include <iostream.h>
#include <conio.h>
class account
{
public:
    int account_no;
    char name[20];
    float balance;
    void accept()
    {
        cout << "Enter account_no";
        cin >> account_no;
        cout << "Enter name";
        cin >> name;
        cout << "Enter balance";
    }
}

```

```

for (i=0; i<=9; i++)
{
    m[i]. accept();
}
for (i=0; i<=9; i++)
{
    m[i]. display();
}
}

```

Q. Write a program to declare a class 'account' with data members as account_no, name, and balance accept this data for 8 accounts & display details of account having balance less than 10,000

```

-> #include <iostream.h>
#include <conio.h>
class account
{
public:
    int account_no;
    char name[20];
    float balance;
    void accept()
    {
        cout << "Enter account_no";
        cin >> account_no;
        cout << "Enter name";
        cin >> name;
        cout << "Enter balance";
        cin >> balance;
    }
}

```


Q. Write a program to declare a class staff having data members as name and department accept this data for file 5 staff; & display name of a staff that are in Computer department.

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

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

```
class staff
```

```
{
```

```
public:
```

```
char name[50];
```

```
char dept[20];
```

```
void accept()
```

```
{
```

```
cout << "Enter name:";
```

```
cin >> name;
```

```
cout << "Enter department:";
```

```
cin >> dept;
```

```
void display()
```

```
{
```

```
if (dept == "C")
```

```
{
```

```
cout << "Name : " << name;
```

```
cout << "Department : " << dept;
```

```
}
```

```
}
```

```
};
```

```

void main ()
{
    Staff s[5];
    int i;
    for (i=0; i<=4; i++)
    {
        s[i].accept();
        cout << "Display data of staff c0";
    }
    for (i=0; i<=4; i++)
    {
        s[i].display();
    }
}

```

Q. Write a program to create a class 'student' having data members as student name, roll no, marks accept data for five students and display the student name & roll no who got distinction (marks > 80) and distinction.

```

#include <iostream.h>
#include <conio.h>
class student
{
public:
    char name[20];
    int roll no, marks;
}

```

```
void accept ()
```

```
{
    cout << "Enter Name:";
    cin >> name;
    cout << "Enter Roll no:";
    cin >> roll-no;
    cout << "Enter marks:";
    cin >> marks;
}
```

```
void display ()
```

```
{
    if (marks > 80)
    {
        cout << "Student Name:" << name;
        cout << "Student Roll no:" << roll-no;
    }
}
```

```
}
```

```
}
```

```
}
```

```
void main ()
```

```
{
    student s[5];
    int i;
    for (i=0; i<=4; i++)
    {
        s[i].accept ();
    }
    for (i=0; i<=4; i++)
    {
        s[i].display ();
    }
}
```

Q. write a program to declare a class College with data member as name and College Code derive a new class student from the class College with data member as student name & Roll no. accept & display details of one student with College data.

```

→
#include <stdio.h>
#include <conio.h>
class College
{
protected :
char name [20];
int code ;
};
class student
{
public :
char sname [20];
int Roll no;

void accept()
{
cout << " Enter data " ;
cin >> name >> code >> sname >> Roll no;
}

void display()
{
cout << " College & student data are " << name << code << endl;
cout << sname << Roll no ;
}
}
    
```

```

void main()
{
    student s;
    s.accept();
    s.display();
}
    
```

Q. Write a program to Find & display smallest no of an array

```

#include <iostream.h>
#include <conio.h>
void main()
{
    cout << "Enter the size of an array" << endl;
    int a[10];
    int n, s, i;
    cin >> n;
    cout << "Enter array elements : " << endl;
    for (i=0; i<n; i++)
    {
        cin >> a[i];
    }
    s = a[0];
    for (i=0; i<n; i++)
    {
        if (a[i] < s)
        {
            s = a[i];
        }
    }
}
    
```

```

    cout << " smaller no : " << s ;
}

```

Q. Write a program to find out largest no of an array.

```

-> #include <iostream.h>
#include <conio.h>
void main()
{
    int a[10];
    int n, l, i;

    cout << " Enter the size of an array ";
    cin >> n;
    for (i=0; i < n; i++)
    {
        cin >> a[i];
    }

    l = a[0];
    for (i=0; i < n; i++)
    {
        if ( a[i] > l )
        {
            l = a[i];
        }
    }

    cout << " largest no is : " << l;
}

```



Q. Write a program to declare structure book with members as book_id, name, accept & display data of 5 books using array of structure.

```

→ #include <iostream.h>
#include <conio.h>
struct book
{
    int book_id;
    char name[50];
};

void main()
{
    struct book b[5];
    int i;
    for (i=0; i<=4; i++)
    {
        cout << "Enter book_id:";
        cin >> b[i].book_id;
        cout << "Enter name:";
        cin >> b[i].name;
    }

    cout << "Details of book";
    for (i=0; i<=4; i++)
    {
        cout << "Book name:" << b[i].name;
        cout << "Book id:" << b[i].book_id;
    }
    getch();
}

```

Q. Write a C++ program to declare class book with member as Book name, and price accept this data for 5 books and display the Book name which has price more than 150.

```

→ #include <iostream.h>
#include <conio.h>
class book
{ public:
  char name [50];
  int price;

```

```

  void accept ()
  {
    cout << "Enter Book name ";
    cin >> name;
    cout << "Enter price : ";
    cin >> price;
  }

```

```

  void display ()
  {
    if (price > 150)
    {
      cout << "Book name : " << name;
    }
  }

```

```

}
int main ()
{
  book b;
  b.accept ();
  b.display ();
}

```



```
void main()
```

```
{
```

```
bank b[5];
```

```
int i;
```

```
for (i=0; i<5; i++)
```

```
{
```

```
    b[i].accept();
```

```
for (i=0; i<4; i++)
```

```
{
```

```
    b[i].display();
```

```
}
```

```
getch();
```

```
}
```

Array Programs

Q.1 Write a program to accept n integers from users into an array and display them one in each line.

```

→ #include <iostream.h>
#include <conio.h>
void main()
{
    int a[20];
    int n, i;
    cout << "Enter size of an array";
    cin >> n;
    cout << "Enter array elements";
    for (i = 0; i < n; i++)
    {
        cin >> a[i];
    }

```

```

    cout << "array elements are";
    for (i = 0; i < n; i++)
    {
        cout << a[i] << endl;
    }
}

```

Q.2 Write a program to accept n integers from user into an array and display them in reverse order.

```

→ #include <iostream.h>
#include <conio.h>
void main()
{

```

```

int a[20];
int n, i;
cout << "enter size of an array";
cin >> n;
cout << "enter elements in the array";
for (i = 0; i < n; i++)
{
    cin >> a[i];
}
cout << "array elements are";
for (i = n - 1; i >= 0; i--)
{
    cout << a[i] << endl;
}
}

```

Q3. Write a program to count the number of digit in user entered number.

```

-> #include <iostream.h>
#include <conio.h>
void main()
{
    int n, count = 0;
    cout << "Enter digit";
    cin >> n;
    while (n > 0)
    {
        n = n / 10;
        count++;
    }
}

```

```

cout << "no of digits: " << endl << count;
getch();
}

```

- Q4. Write a program to find the sum & product of all the digits of user entered number using do while loop.

→

```

#include <iostream.h>
#include <conio.h>
void main()
{
    int n, s=0, p=1, d;
    cout << "Enter n";
    cin >> n;
    do
    {
        d = n % 10;
        s = s + d;
        p = p * d;
        n = n / 10;
    } while (n > 0);
    cout << "Sum = " << s << " Product = " << p;
}

```

- Q5. Write a program to calculate the value of the following series:

$$\frac{1}{1!} + \frac{2}{2!} + \frac{3}{3!} + \dots + \frac{n}{n!}$$

```

→ #include <iostream.h>
#include <conio.h>
void main()
{
    int n, i, s=1, f=1;
    cout << "Enter the elements: ";
    cin >> n;
    for(i=1; i<=n; i++)
    {
        f = f * i;
        s = s + 1/f;
    }
    cout << "Sum of series is: " << s;
    getch();
}

```

Q. write a program to accept 10 elements in an array and find out how many elements are even

```

→ #include <stdio.h>
#include <conio.h>
void main()
{
    int a[10];
    int i, count = 0;
    cout << "Enter elements in array: ";
    for(i=0; i<10; i++)
    {
        cin >> a[i];
    }
}

```

```

for (i = 0; i < 10; i++)
{
    if (a[i] % 2 == 0)
    {
        count++;
    }
}
cout << "no of even is : " << count;

```

Q. Write a program to accept 20 elements in array & find out how many elements are positive negative & zero.

→

```

#include <stdio.h>
#include <conio.h>
void main()
{
    int a[20], i, count = 0, n = 0, z = 0;
    cout << "Enter Elements";
    for (i = 0; i < 20; i++)
    {
        cin >> a[i];
    }
    for (i = 0; i < 20; i++)
    {
        if (a[i] > 0)
        {

```

```

Count ++;
}
else if ( a[i] < 0 )
{
Count ++; z++;
}
else
{
z++;
}
}

```

```

cout << "positive element: " << count;
cout << "Negative element: " << count z;
cout << " zero element : " << z;
}

```

2. Write a program to accept 10 elements in an array & print even number from that array.

```

#include <stdio.h>
#include <conio.h>
void main()
{
int a[10], i;
cout << "Enter elements ";
for (i=0; i<10; i++)
{
cin >> a[i];
}
}

```

```

for (i=0; i<10; i++)
{
    if (a[i] % 2 == 0)
    {
        cout << "Even no is : " << a[i] << endl;
    }
}
getch();
}

```

Q. write a program to accept 10 elements in array and then find out sum & mean value.

```

-> #include <stdio.h>
#include <conio.h>
void main()
{
    int a[10], i, sum=0, mean;
    cout << "Enter elements in array : ";
    for (i=0; i<10; i++)
    {
        cin >> a[i];
    }

    for (i=0; i<10; i++)
    {
        sum = sum + a[i];
    }
    mean = sum / 10;

    cout << "sum : " << sum;
    cout << "mean : " << mean;
}

```


Q. Write a program to input 10 elements in array and print the given array in ascending order.

→

```
#include <stdio.h>
#include <conio.h>
void main()
```

```
{
    int a[10], i, j, x;
    cout << "Enter array elements : ";
```

```
for (i=0; i<10; i++)
{
    cin >> a[i];
}
```

```
for (i=0; i<10; i++)
{
```

```
    for (j=i+1; j<5; j++)
```

```
    {
        if (a[i] > a[j])
        {
```

```
            x = a[i];
```

```
            a[i] = a[j];
```

```
            a[j] = x;
        }
    }
```

```
for (i=0; i<10; i++)
```

```
{
    cout << "ascending array is : " << a[i];
}
```