Array

- Offers a simple way of grouping like variables for easy access
- It is a group of elements having same data type
- An array is a collective name given to a group of ‘similar quantities’
- Arrays in C share a few common attributes
    - Variables in an array share the same name
    - Variables in an array share the same data type
    - Individual variables in an array are called *elements*
    - Elements in an array are accessed with an index number

Cont.

```
main( )
{
    int x ;
    x = 5 ;
    x = 10 ;
    printf ( "\nx = %d", x );
}
```

- Ordinary variables are capable of holding only one value at a time
- There are situations in which we would want to store more than one value at a time in a single variable

Cont.

- For example, suppose we want to arrange the percentage marks obtained by 100 students in ascending order
- In such a case we have two options to store these marks in memory:
    - Declare 100 variables to store percentage marks obtained by 100 different students, i.e. each variable containing marks of single student

      int m1, m2, m3 …… m100;
    - Declare one variable (called array or subscripted variable) capable of storing or holding all the hundred values

Array declaration

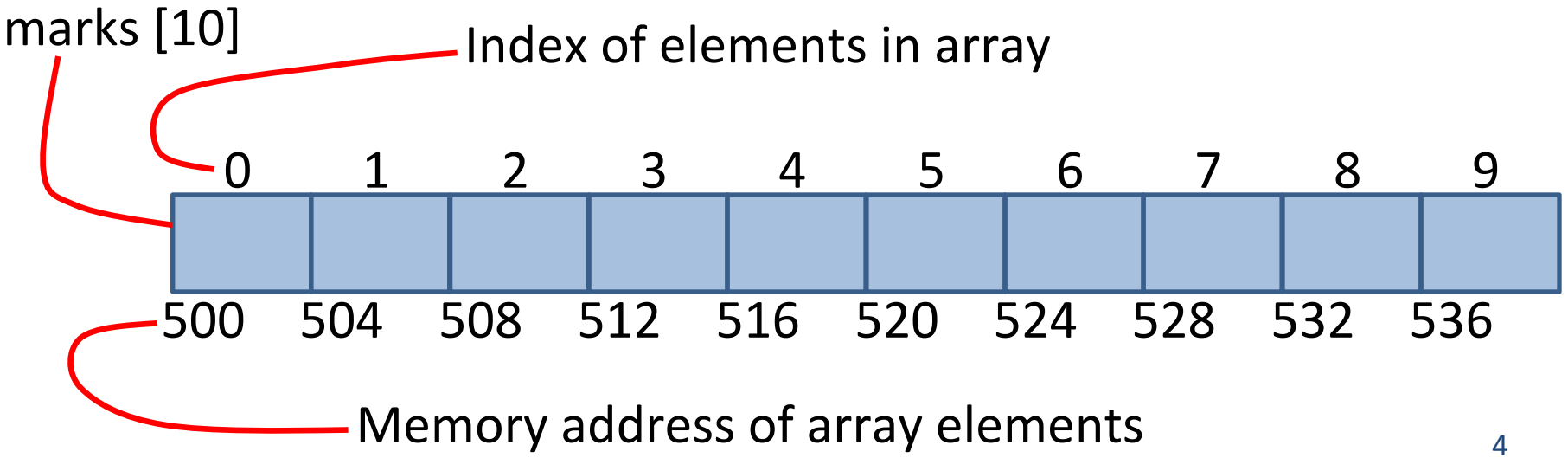
```
int marks[10];
```

type

Array name

size

Like any other variable, arrays occupy memory space



How to access array elements

```
int x;
x= 2;
cin>>x;
cout<<x;
```

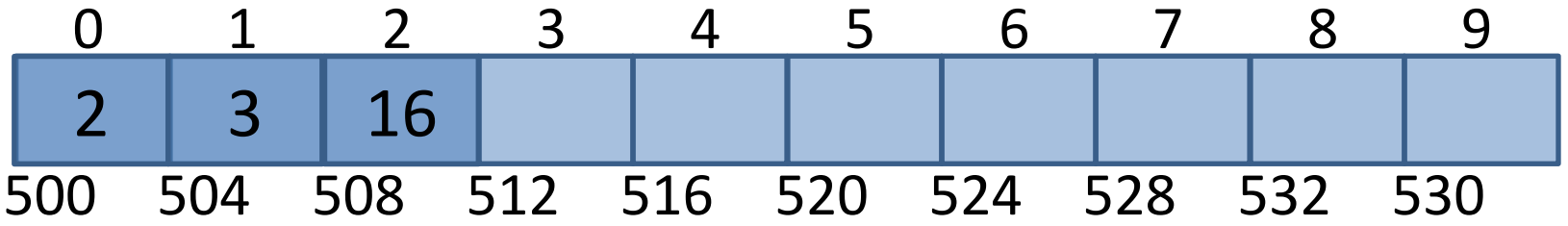
x 43

695

Output
x = 43

```
int marks[10];
marks[0] = 2;
marks[1] = 3;
cin>>marks[2];
cout<<marks[2];
```

Output
marks [2] = 16



Points to remember

- Array is a collection of elements having same data type
- Memory allocate to array elements are continuous
- Array size must be mentioned in array declaration (int marks [10];)
- Array index always starts with 0
- In 10 elements array, index of first elements is 0 and index of last element is 9
- Array element can be access using array index

A Simple Program Using Array

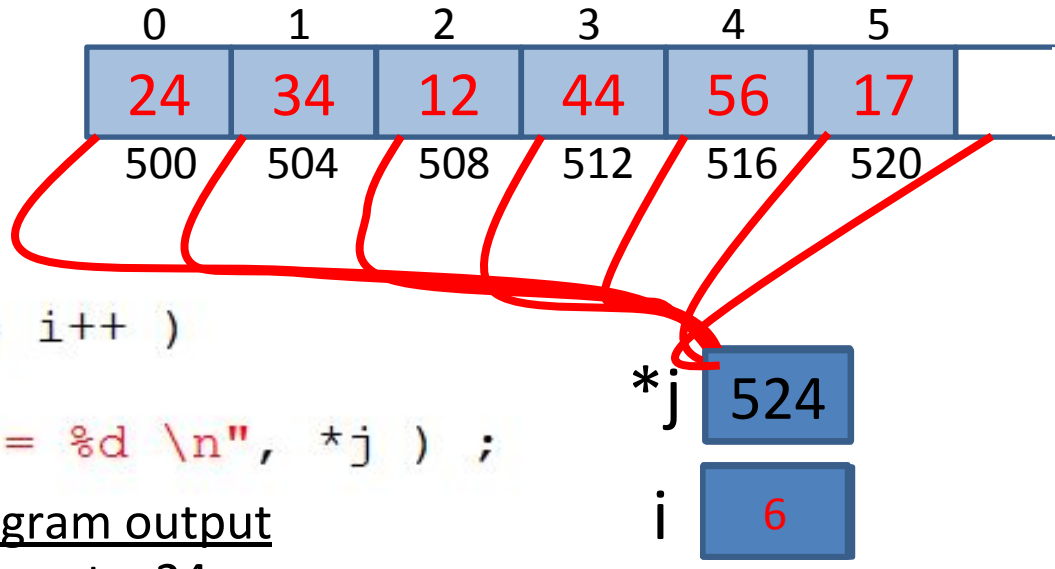
- Write a program that take 10 integer from user and then display those integers

Marks program

```
main( )
{
    int avg, sum = 0 ;
    int i ;
    int marks[10] ; /* array declaration */
    for ( i = 0 ; i <= 9 ; i++ )
    {
        printf ( "\nEnter marks " ) ;
        scanf ( "%d", &marks[i] ) ;
    }
    for ( i = 0 ; i <= 9 ; i++ )
          sum = sum + marks[i] ;
    avg = sum / 10 ;
    printf ( "\nAverage marks = %d", avg ) ;
}
```

Passing array to a function

```
void display(int *);
main( )
{
   int num[6] = { 24, 34, 12, 44, 56, 17 };
   display( &num[0] );
   system("pause");
}
void display( int *j)
{
   int i ;
   for ( i = 0 ; i <= 5 ; i++ )
   {
      printf ( "element = %d \n", *j ) ;
      j++ ;
   }
}
```



Program output

element = 24
element = 34
element = 12
element = 44
element = 56
element = 17