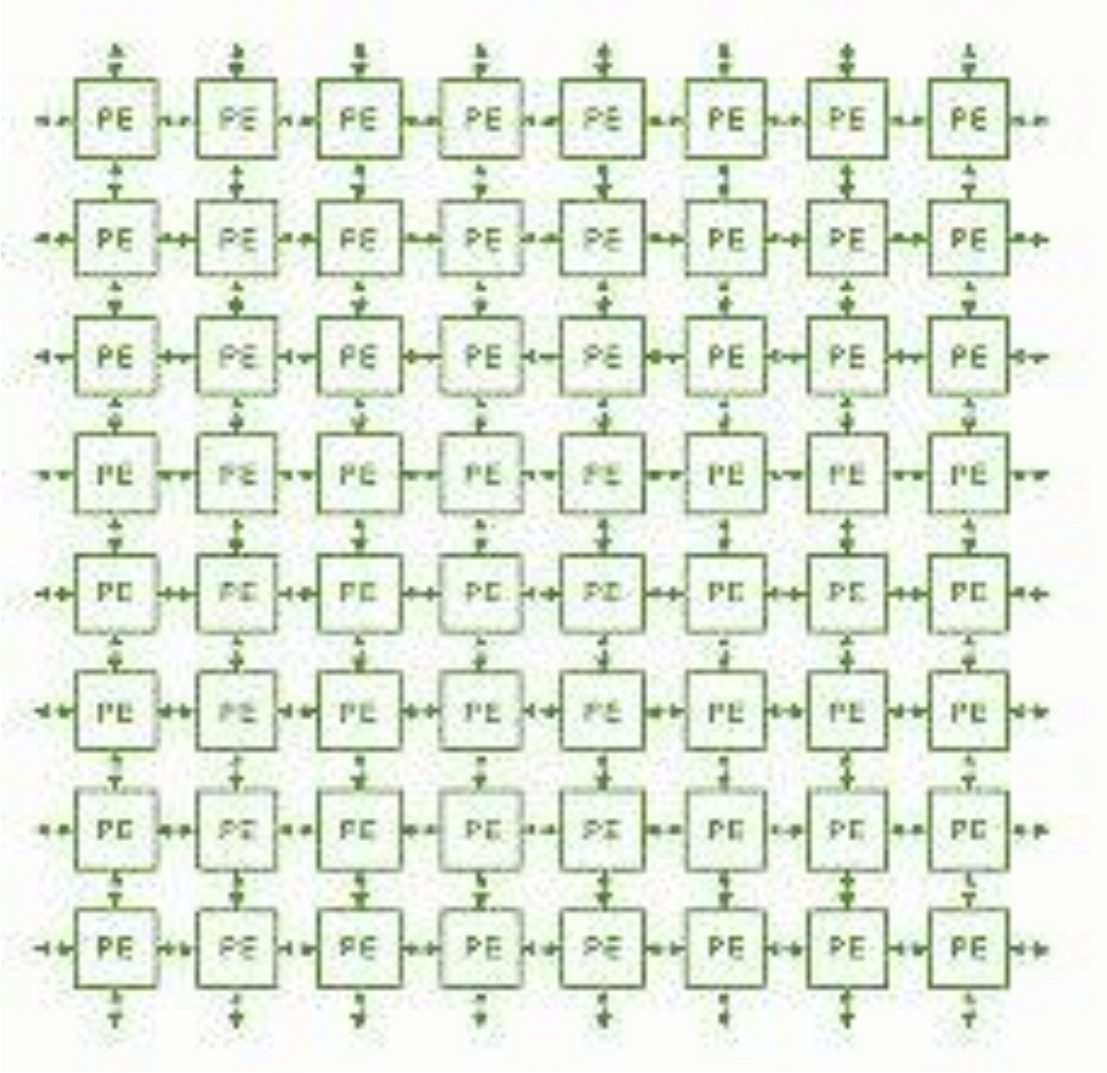


S10_2

1 D - A r r a y s

Objectives

To learn and appreciate the following concepts:

- Declare, initialize and access 1D array.
- Write programs using common data structures namely arrays and strings and solve problems.

Session outcome

- At the end of session student will be able to

  → Declare, initialize and access 1D array

  → Write programs using 1D array

Arrays – recap

1D Array:

- Syntax: type array_name[size];

- Memory Requirement:
  Total size =size *(sizeof(data_type));

- Initialization:
  type array-name [size]={list of values}

- Write and Read:

```
for(i=0;i<n;i++)          for(i=0;i<n;i++)
 scanf("%d",&a[i]);       prinft("%d\n",a[i]);
```

WAP to insert an element to an array at a given position

```
int a[100], n,i, pos, ele;
 scanf("%d",&n); // number of elements
printf("\nEnter the elements of array:");
for(i=0;i<n;i++)
 scanf("%d",&a[i]);
printf("\nEnter the element and position  of insertion:");
 scanf("%d %d",&ele,&pos);
for(i=n; i>=pos; i--)  //shift the elements to right
      a[i]=a[i-1];
a[pos-1] = ele;  //ele is inserted at  the specified  pos.
n = n + 1;      // increment the count of no of elements
printf("\nThe array after insertion is:");
for(i=0;i<n; i++)    printf("%d\n",a[i]);
```

Example : insert 9 at 2nd position
a[ ]={1, 2, 3, 4, 5}

New array after inserting 9 :
a[ ]={1, 9, 2, 3, 4, 5}

WAP to delete an element from an array

```
printf("enter no of numbers“);
scanf(“%d”,&n);
printf("enter  n numbers \n“);
for(i=0;i<n;i++)
    scanf(“%d”,&a[i]);
printf("enter the position at which the element to be deleted“);
scanf(“%d”,&pos);
for(i=pos-1; i<n-1; i++)
    a[i] =a[i+1]; //shift the elements to left
n = n-1;      //decrement the count of no of elements
for(i=0;i<n;i++)
    printf(“%d”,a[i]);
```

Example : delete ele at 2nd position
a[ ]={1, 2, 3, 4, 5}

New array after deleting 2:
a[ ]={1, 3, 4, 5}

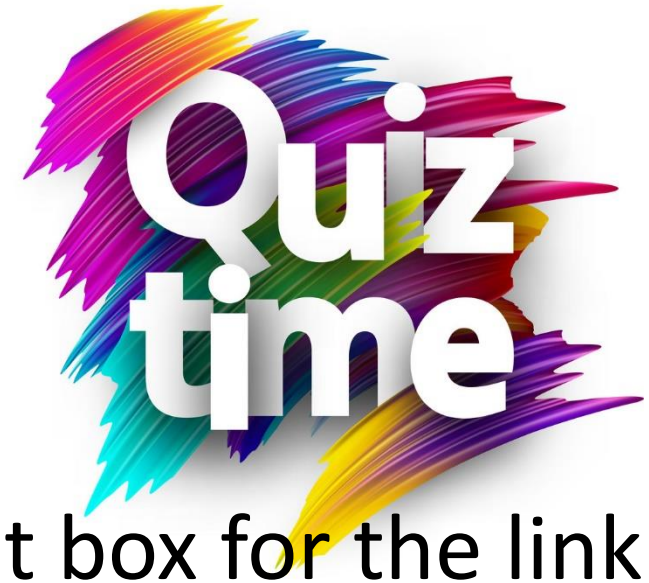
Insert an element into a sorted array

Read array elements (in sorted order) & element '**ele**' to be inserted

```
//finding position
for(i=0;i<n;i++)
        if (ele<a[i])
            break;
 pos = i+1; //position of insertion
for(i=n; i>=pos; i--) //shift the elements to right
   a[i]=a[i-1];
a[pos-1] = ele; //ele is inserted at  the specified  pos.
n = n + 1;     // increment the count of no of elements
```

Example: insert 3 into the array
a[ ] = {1, 2, 4, 5, 6}

New array after inserting 3 :
a[ ] = {1, 2, 3, 4, 5, 6}



Go to posts/chat box for the link to the question

submit your solution in next 2 minutes

The session will resume in 3 minutes

Tutorials on Array

- Write a C program to find average of an 1-D array.
- Write a C program to find second largest element in an array.
- Write a C program to find union and intersection of two arrays.

Largest and second largest element in an array

```
/*  assume first element of the array as the largest & second largest */
    largest1 = array[0];
    largest2 = array[1];

        for (i = 1; i < MAX; i++)
        {
            if (array[i] >= largest1)
            {
                largest2 = largest1;
                largest1 = array[i];
            }
            else if (array[i] > largest2)
            {
                largest2 = array[i];
            }
        }
```

Example: array[ ] = {22,44, 34, 9, 21}

```
44 is largest
34 is second largest
```

Summary

- Problems on 1D arrays