

Lecture 14

Array: Array is a list of variables, which are all of the same type and are referenced through a common name. An individual variable in the array is called an array element.

Advantages of array:

- Reduce ordinary variable
- Allocates memory sequentially

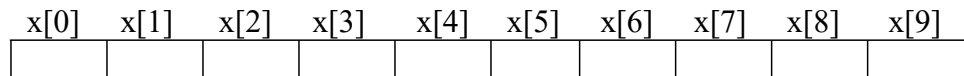
Disadvantages of array:

- Insertion difficult
- Deletion difficult
- Wastage of memory

Array declaration: We can declare an array in two ways.

- Static array
- Dynamic array

```
int x[10];
```



This is called static declaration of an array.

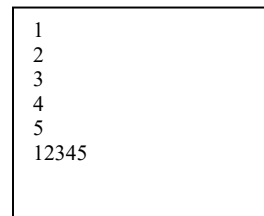
```
int *p, n;
scanf("%d",&n);
p = (int * ) malloc (n * sizeof(int));
```

This is called dynamic declaration of an array. By using (void*)malloc(int size) we can declare dynamic array.

One dimensional arrays: Say, int a[5];

Example 1:

```
void main()
{
    int a[5];
    for(i = 0; i < 5; i++)
        scanf("%d",&a[i]);
    for(i = 0; i < 5; i++)
        printf("%d",a[i]);
}
```



Example 2:

```

void main()
{
    char *p, n, i ;
    scanf("%d",&n);
    p = (char *) malloc (n);
    for ( i = 0 ; i < n ; i ++ )
        scanf("%d", ( p + i ));
    for ( i = 0 ; i < n ; i ++ )
        printf("%d", *( p + i ));
}

```

```

5
1
2
3
4
5
12345

```

Example 3:

```

void main()
{
    int days[31], n, avg = 0, i ;
    printf(" How many days ? \n");
    scanf("%d",&n);
    for ( i = 0 ; i < n ; i ++ ){
        scanf("%d", & day [i] );
        avg = avg + day [i] ;
    }
    printf(" Average temperature = %f", (float)avg/n);
}

```

Consider the declaration, `int (*any)(int, int).`

This declaration indicates that any is a pointer of function which can take two integer type values as argument and also return an integer type value.

Example 4:

```

int sum(int a, int b);
void main()
{
    int a, b;
    int (*sab)(int, int);
    sab = sum;
    scanf("%d%d", &a, &b);
    printf("\n%d",sab(a,b));
}

```

```

int sum (int a, int b)
{
    return a+b;
}

```

```

5
4
9

```

Example 5:

```

void main()
{
    int a[6], sqr_a[6], *p, *q ;
    p = a ;
    q = sqr_a;
    for( i = 0 ; i < 5 ; i ++){
        *p = i + 1 ;
        p ++ ;
        *q = (i + 1)*(i + 1);
        q ++ ;
    }
    for( i = 0 ; i < 5 ; i ++ )
        printf(“%d/t%d\n”,a[i],sqr_a[i]);
}

```

1	1
2	4
3	9
4	16
5	25

Passing array to a function: We can pass the whole array to a function by just sending the first element of that array.

Example 6:

```

void input(int *);
void output(int []);

void main()
{
    int a[10];
    input (a);
    output(a);
}

void input(int *a)
{
    int i;
    for( i = 0 ; i < 10 ; i ++){
        scanf(“%d”, (a+i));
    }
}

void output(int a[10])
{
    int i;
    for( i = 0 ; i < 10 ; i ++){
        printf(“%d”, a[i] );
    }
}

```

1
2
3
4
5
6
7
8
9
10
12345678910