

POINTERS IN C

PART I

FAQs

1. What is a pointer?

A pointer value or pointer is a data object that refers to a memory location, which is an address. It resides in the memory location, which is represented by the pointer variable. Thus a pointer variable (address variable) may contain the address of another variable or any valid address in the computer memory.

2. How can we declare a pointer variable?

The general format for declaration of pointer variable is

```
data_type * var1, *var2,.....*varn;
```

Where data_type refers to the data type of the value stored in the address given by the pointer variable and var1,var2,.....varn are pointer variables.

For example, we can't use a variable in a program without declaring it and if j is a variable that contains the address of another integer variable i, it is declared as,

```
int *j ;
```

This declaration tells the compiler that j will be used to store the address of an integer value. In other words j points to an integer.

3. What are the unary operators that are exclusively used in connection with pointers?

The unary operators used in pointers are

- address of operator denoted by & (ampersand) and
- indirection or dereferencing operator, denoted by * (asterisk)

Each of these operators must precede its operand. Pointer expressions are formed by using these operators & and * with their respective operands. The address of operator & returns the address of its operand. The indirection operator * is used to access the value pointed by its operand. The operand must be a pointer variable or a pointer expression.

4. Explain the concept of array of pointers.

Whenever addresses are stored as array elements, such an array is called an array of pointers. The format for the declaration of an array of pointers is

```
data type * array_name[size];
```

For example, the declaration float *a[10]; allocates the memory for 10 pointers, which are to be stored in the variables a[0], a[1],, a[10].

5. How pointers can be used to handle character arrays?

Like the other arrays, the **array name** of the character array also gives the address of the zeroth element in that array. For example, in the following statements,

```
char *p;
```

```
P="POINTER IN C";
```

the address of 'P' is assigned to the pointer p. The second statement is actually initialization of pointer and not string copying. After this assignment it is possible to use p[0], p[1] so on.

Whenever more than one strings are to be stored in an array the two-dimensional array is required to store each string in a row. For example, consider an array of strings,

```
char cities [3][20];
```

Here 'cities' is a table containing 3 names, each with a maximum length of 20 characters including null characters.