

e-Lecture on C Programming

for

B.Sc. Second Semester

Paper code: 201

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Pointers in C

- Pointers (pointer variables) are special variables that are used to store addresses rather than values.
- A Pointer in C is used to allocate memory dynamically i.e. at run time. The pointer variable might be belonging to any of the data type such as int, float, char, double, short etc.
- * is used to denote that “p” is pointer variable and not a normal variable.
- & symbol is used to get the address of the variable.
- * symbol is used to get the value of the variable that the pointer is pointing to.

Pointer Example

A simple program for pointer illustration is given below:

```
#include <stdio.h>
int main()
{
    int a=10;    //variable declaration
    int *p;     //pointer variable declaration
    p=&a;       //store address of variable a in pointer p
    printf("Address stored in a variable p is:%x\n",p); //accessing the address
    printf("Value stored in a variable p is:%d\n",*p); //accessing the value
    return 0;
}
```

Output:

```
Address stored in a variable p is:60ff08
Value stored in a variable p is:10
```

Array of Pointers

- There may be a situation when we want to maintain an array, which can store pointers to an int or char or any other data type available. Following is the declaration of an array of pointers to an integer

```
int *ptr[MAX];
```

- It declares **ptr** as an array of MAX integer pointers. Thus, each element in ptr, holds a pointer to an int value.

Array of Pointers Example

```
#include <stdio.h>

const int MAX = 4;

int main () {

    char *names[] = {
        "Zara Ali",
        "Hina Ali",
        "Nuha Ali",
        "Sara Ali"
    };

    int i = 0;

    for ( i = 0; i < MAX; i++) {
        printf("Value of names[%d] = %s\n", i, names[i] );
    }

    return 0;
}
```

When the above code is compiled and executed, it produces the following result –

```
Value of names[0] = Zara Ali
Value of names[1] = Hina Ali
Value of names[2] = Nuha Ali
Value of names[3] = Sara Ali
```