



Pointers in C

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ABSTRACT

C language is a computer programming language. It is a mother language of all other languages. As a general program can not solve each and every problem so different programs are formed. To make coding easy some features are provided by C language like pointer.

A pointer is also a variable which is used to store the address of another variable of same data type. Pointers make the variable, array, function etc accessibility easy and compatible. Pointers also reduce the length and complexity of program.

KEYWORDS: Pointers: declaration of pointers; initialization of pointers; dangling pointers.

INTRODUCTION

Pointers is a programming language object which is used to point the memory address of another variable of same data type. Pointer increases the execution speed of program and enables programmer to access the variable defined outside the function. "*" and "&" operators are used to declare and access pointers. Pointer gives an advantage for dynamic memory allocation. To create link list to connect one node to another using pointers.

DECLARATION OF POINTER

Syntax: <data type> * variable name;

int *p;

'p' is pointer variable which will point a variable of same data type.

ASSIGNING OF POINTERS

For example:

int x;

int *p;

p=&x;

In above example 'p' is a pointer variable and it is assigned by the address of variable 'x' and 'x' is of same data type.

ARRAY AND POINTERS

For example:

int arr[5];

int *ptr =arr;

As array name stores base address of array and pointer variable stores the address of variable.

In above example 'arr' is an array name and it is assigned to pointer. Now by incrementing or decrementing pointer value programmer can access every element of array and perform any operation on it. [1]

POINTERS AND LINK-LISTS

For example:

Struct student

{

int rollno;

struct student *S;

};

In above declaration of structure is known as self-referencing structure. self-referencing structure contains pointers which will connect one node to another by pointing them.

FUNCTIONS AND POINTERS

For example

```
Void print(*N)
```

```
{
  *N=20;
}
```

```
Void main()
```

```
{
  int Q;
  print(&Q);
}
```

In above coding function is called by 'call by reference method'. In this method in function call variable address is send and in function argument it contain pointer to receive variable address.

As pointer can access variable value so it can be changed permanently.[2]

DANGLING POINTERS

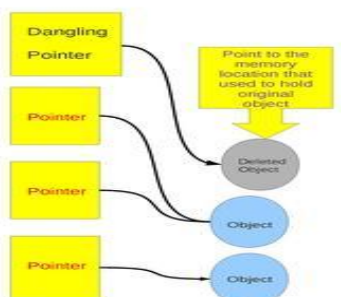
A situation may arise when pointer declaration or assignment is not as per syntax.

When a pointer does not point to a valid object that pointer is called dangling pointer.

This dangling pointer situation may leads to program crash.

For example:

```
{
  Char *gp=NULL;
  /*.....*/
  {
    Char c;
    gp=&c;
  }
  .
  .
  .
```



```
.}
```

In above code 'c' when falls out of the scope then gp is a dangling pointer.[3]

SUMMARY

Pointers is one of the best feature of c language as it increases the speed of execution of program. It reduces the length and complexity of program.

As every coin has two faces pointers too have a disadvantage as they are use according to syntax if syntax is not followed then it may lead to the suitation of dangling pointer and it might lead to program crash and insecurity.

REFERENCES

- [1] Pointeranalysis:haven't we solved this problem yet? By Michael Hind IBM Watson research centre.
- [2] Precise call graph for c programs with function pointers by Ana Milanova(department of computer science,Rensselaer polytechnic institute),AtanasRoutev(department of computer and information science,Theohio state university),and Barbara G.Ryder(Division of computer and information science,Rutgers university).
- [3] Dangling pointer by Jonathan Afek ADI SHARABANI.