SELF REFERENTIAL STRUCTURES

Self Referential structures are those structures that have one or more pointers which point to the same type of structure, as their member. In other words, structures pointing to the same type of structures are self-referential in nature.

Syntax:

```
struct structname
{
        Datatype    member1;
        Datatype     member2;
                . . .
        Datatype     member n;
 };
```

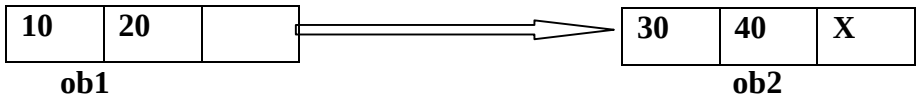
Example:

```
 struct node
 {
         int data1;
         char data2;
        struct node* link;
 };
  int main()
 {
        struct node ob;
        return 0;
 }
```

Types of Self Referential Structures

- Self Referential Structure with Single Link
- Self Referential Structure with Multiple Links

Self Referential Structure with Single Link: These structures can have only one self-pointer as their member. The following example will show us how to connect the objects of a self- referential structure with the single link and access the corresponding data members. The connection formed is shown in the following figure.



Self Referential Structure with Single Link

Program

```
#include <stdio.h>
#include<conio.h>
struct node
{
        int data1;
        char data2;
        struct node* link;
};
int main()
{
        struct node ob1; // Node1

         // Intialization
ob1.link = NULL;
  ob1.data1 = 10;
      ob1.data2 = 20;
struct node ob2; // Node2
```

```
        // Initialization
        ob2.link = NULL;
        ob2.data1 = 30;
        ob2.data2 = 40;
        // Linking ob1 and ob2
        ob1.link = &ob2;
        // Accessing data members of ob2 using ob1
        printf("%d", ob1.link->data1);
        printf("\n%d", ob1.link->data2);
        getch();
}
```

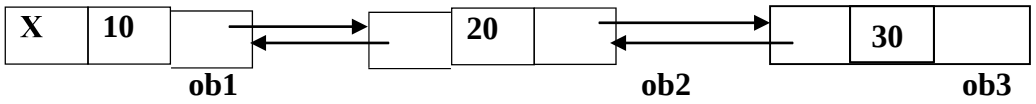
Output:

30

40

Self Referential Structure with Multiple Links:

Self referential structures with multiple links can have more than one self-pointers. Many complicated data structures can be easily constructed using these structures. Such structures can easily connect to more than one nodes at a time. The following example shows one such structure with more than one links.



***Self Referential Structure with Multiple Link*s**

Applications:

Self referential structures are very useful in creation of other complex data structures like:

- Linked Lists
- Stacks
- Queues
- Trees
- Graphs etc