

MA 511: Computer Programming

Lecture 15

http://www.iitg.ernet.in/psm/indexing_ma511/y08/index.html

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Mon 10:00-10:55 Tue 11:00-11:55 Fri 9:00-9:55 Class: 1G2

MA512 Lab : Wed 14:00-16:55

Self-Reference Structure

```
struct tag {  
    member 1;  
    member 1;  
    .....  
    struct tag *name;  
};
```

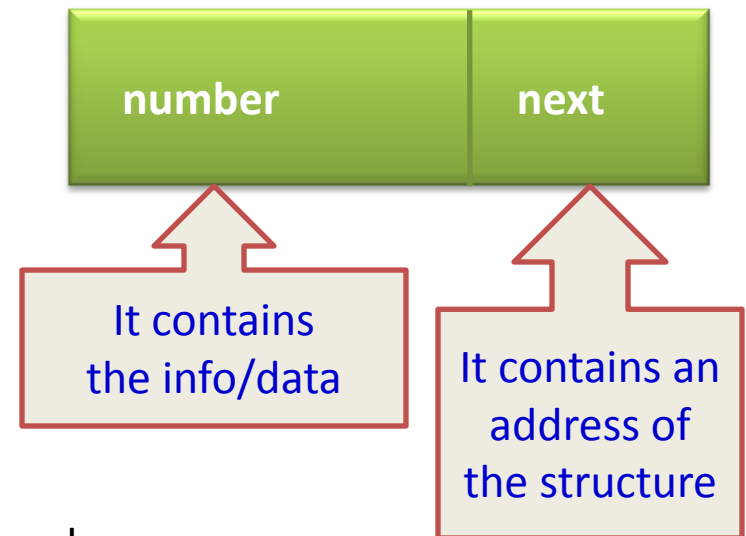
Example:

```
struct list_of_no {  
    int number;  
    struct list_of_no *next;  
};
```

It's a structure of type *list_of_no*. there are two members;

1. **number** is a **integer** type and
2. **next** is a **pointer to a structure** of the same type, i.e., a pointer to a structure of type *list_of_no*.

list_of_no structure looks like



Linked Lists using Self-Reference Structure

```
struct list_of_no {  
    int number;  
    struct list_of_no *next;  
};
```

```
typedef struct list_of_no node;  
node *start;  
start = (node *) malloc(sizeof(node));
```



How to create a linked list *recursively*?

```
#define NULL 0
struct list_of_no {
    int data;
    struct list_of_no *next;
};
typedef struct list_of_no node;
void create(node *pt);
void print(node *pt);

main(){
    node *start;
    start = (node *) malloc(sizeof(node))
    create(start);
    print(start);
}
```

```
void create(node *temp){
    node *temp1;

    printf("Type int for continue Type 999 for stop:");
    scanf("%d", &(temp->data));

    if(temp->data==999)
        temp->next = NULL;
    else{
        temp1 = (node *) malloc(sizeof(node));
        temp->next = temp1;
        create(temp1);
    }
}

void print(node *temp){
    while(temp->next){
        printf("|%d |->", temp->data);
        temp=temp->next;
    }
}
```

