MA 511: Computer Programming

Lecture 11: Linked list

http://www.iitg.ernet.in/psm/indexing_ma511/y10/index.html

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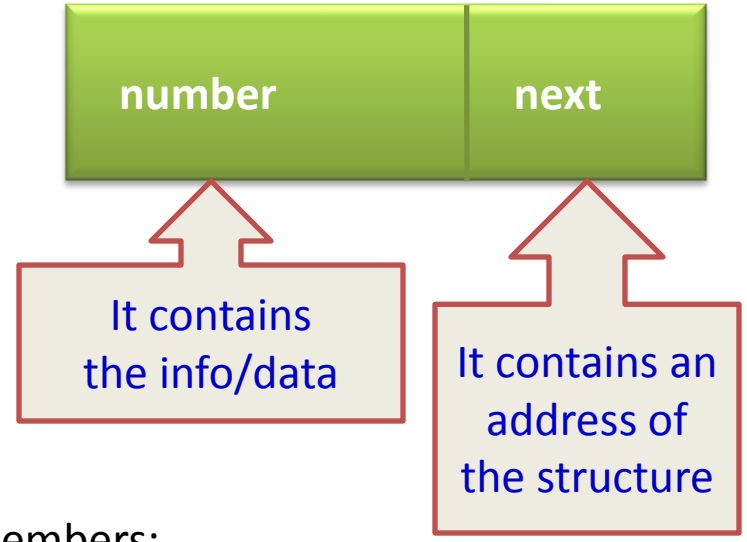
Self-Reference Structure

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

Example:

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

list_of_no structure looks like



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.*

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;
        }
}
```