MA 511: Computer Programming

Lecture 12: Insert & delete nodes

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

Partha Sarathi Mandal

psm@iitg.ernet.ac.in

Dept. of Mathematics, IIT Guwahati

Semester 1, 2010-2011

How to **insert** node in a linked list?

1. At the beginning of the list
2. At the middle of the list
3. At the end of the list

:

:

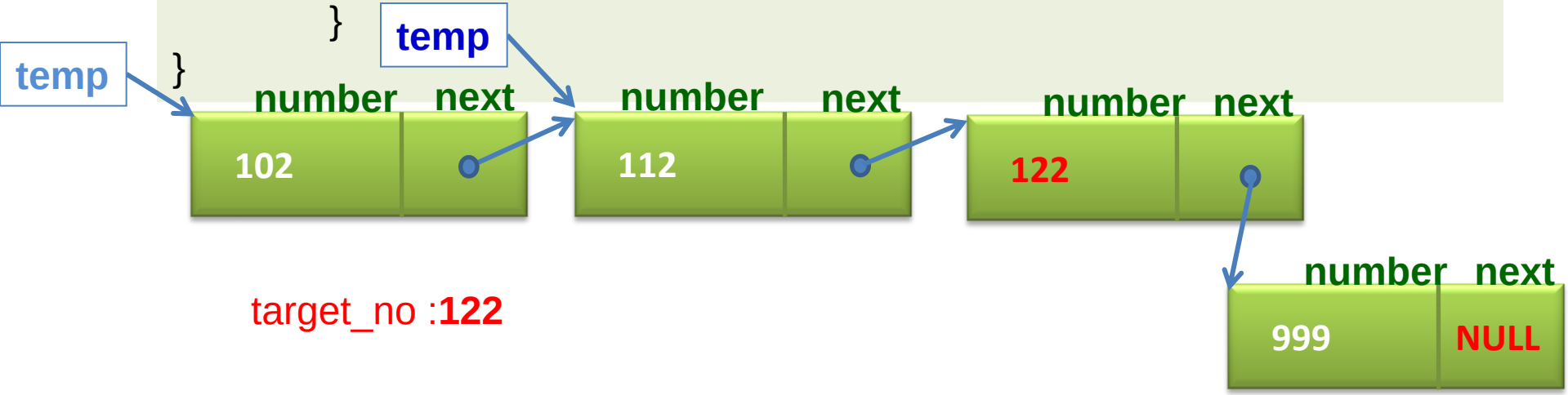
```
node *insert(node *pt);

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

```
node *insert(node *start){
node *search(node *, int);
node *newnode, *terget;
int target_no;
  printf("type target  ");
  scanf("%d", target_no);
  if(start->data == target_no){ //add before target:at the beginning
        newnode = (node *) malloc(sizeof(node));
         scanf("%d", &(newnode->data));
         newnode->next= start;
         start = newnode;
  }
  else{  // finder return ptr of the preceding to the target node
         target = search(start, target_no);
                if (terget ==NULL) printf("target no is not in list");
                else { // add in the middle of the list
                      newnode = (node *) malloc(sizeof(node));
                      scanf("%d", &(newnode->data));
                      newnode->next = target->next;
                      terget->next= newnode;
         }
  }
return(start);
}
```

Searching the target node

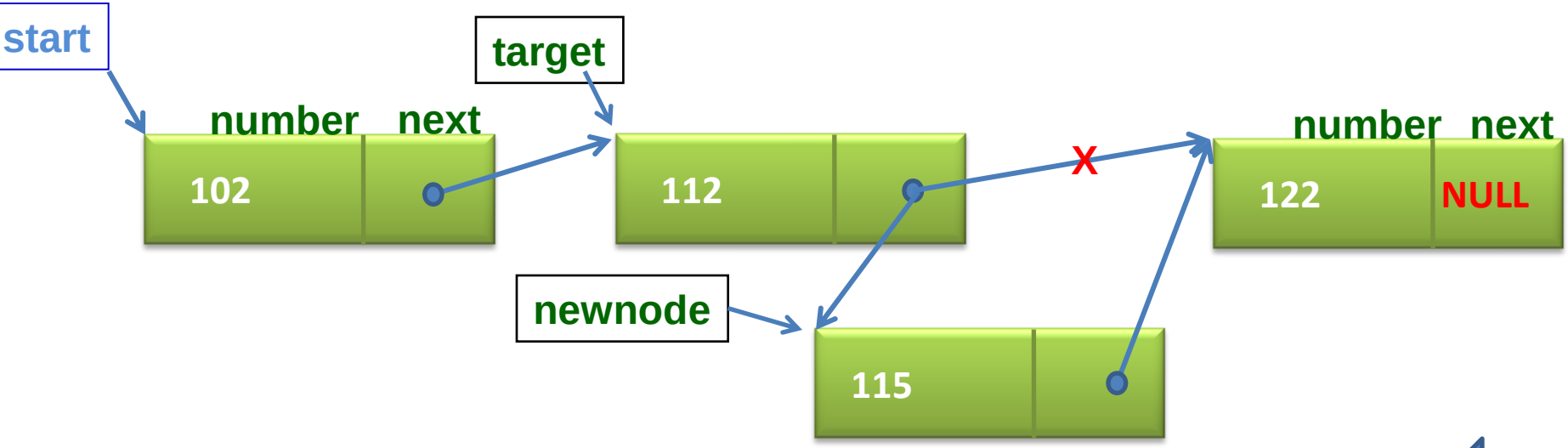
```
node *search(node *temp, int target_no){
        //return a ptr to the node before the target node
        while(1){
                if(temp->next->data==target_no)
                        return(temp);
                else if(temp->next->next==NULL)
                        return(NULL);
                else temp=temp->next;
        }
}
```



target_no :**122**

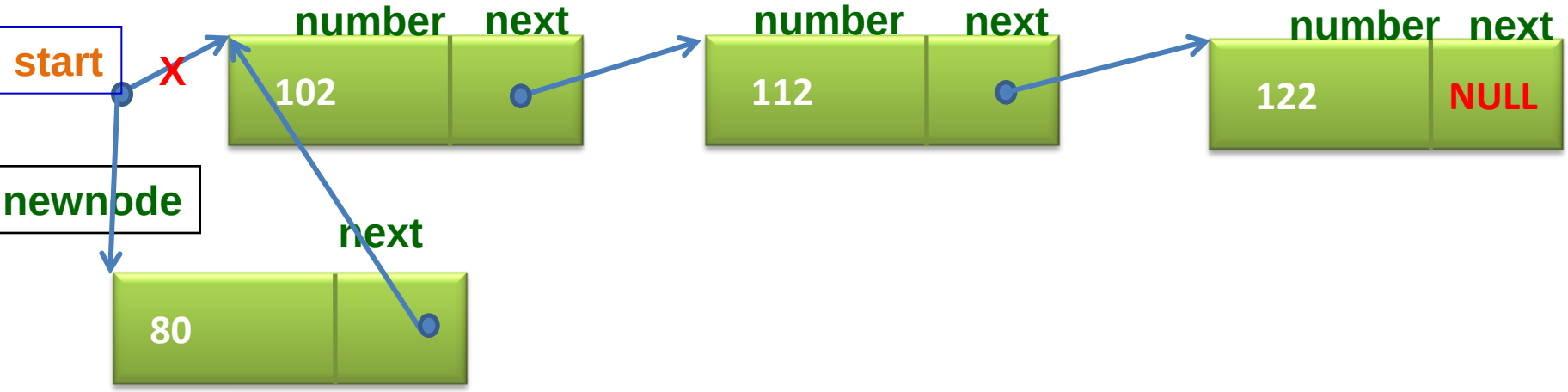
How to **insert** node in **middle** of the list?

```
newnode = (node *) malloc(sizeof(node));
        scanf("%d", &(newnode->data));
        newnode->next = target->next;
        target ->next= newnode;
```



How to **insert** node to the **beginning** of the list?

```
newnode = (node *) malloc(sizeof(node));
        scanf("%d", &(newnode->data));
        newnode->next= start;
        start = newnode;
```



How to **delete** node from a linked list?

```
node *delete(node *start){
node *search(node*, int)
node *target, *temp;
int target_no;
printf("Place before target  999 at end ");
 scanf("%d", target_no);
 if(start->data == target_no){   // delete from beginning
            temp= start->next;
            free(start);
            start = temp;
 }
 else{  // finder return ptr of the preceding to the target node
            target = search(start, target_no);
            if (terget ==NULL) printf("target no is not in list");
            else { // delete from the middle of the list
                        temp = target->next->next;
                        free(target->next);
                        target->next= temp;
            }
 }
return(start);
}
```

Assignment

1. Write a C-Program for inserting a new node in a linked list maintaining order with respect to the key value of nodes. Where key value of a new node should enter in from the console.

2. Insert a node after a given target key.

3. Write a C-Program for deleting the node(s) from a given linked list which is(are) matched with a given target key.

4. Form a given linked list (key values are +ve integers) filters out (deletes) all nodes with odd integers and create a new linked list with the add integers. [finally there will be two linked lists one with even integers and other (new list) with odd integers]. Print the given list before deletion and print final two lists separately.

For above all problems the given list you have to create first, taking input from console