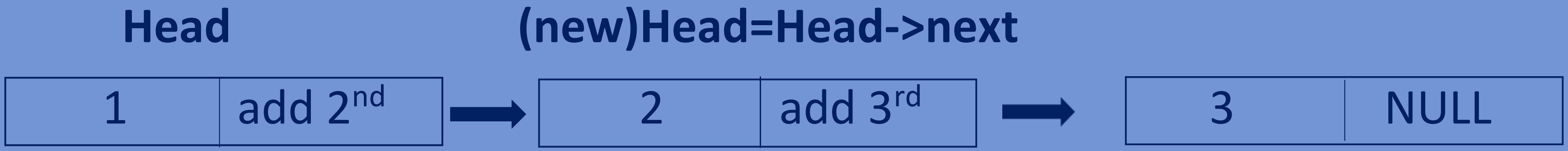
Data Structures

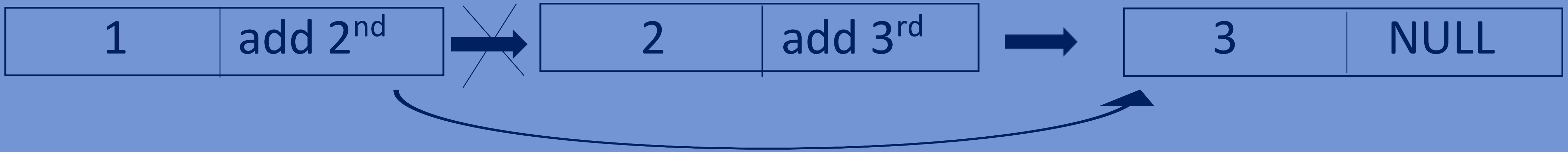
Deletion of a node in the linked list

Deleting a node at a given position:

- Deleting the head node(position 1).



- Deleting the node at any position other than position 1



➢ To delete the first node at position 1 make the second node as head by Storing head->next in head.

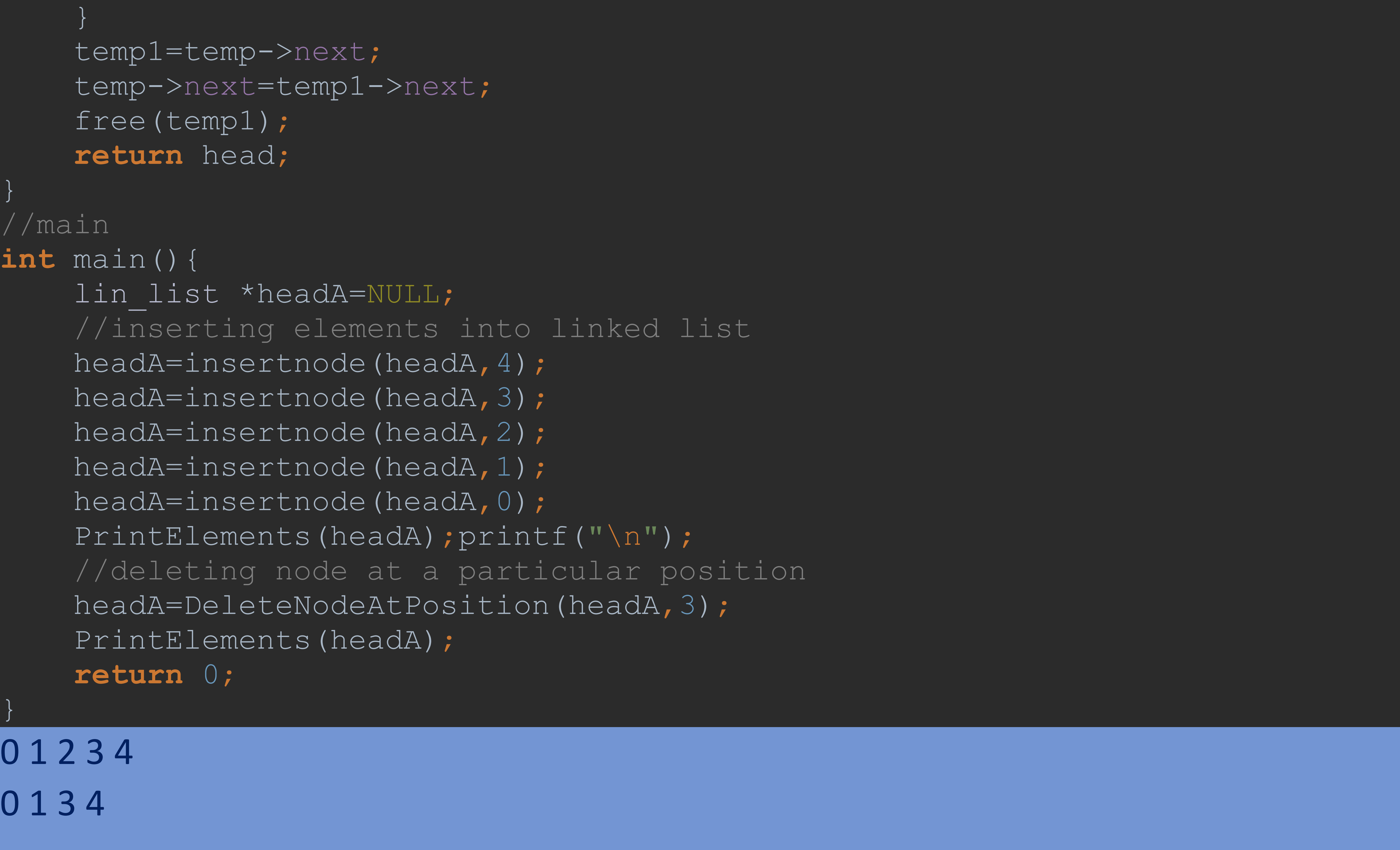
➢ To delete the remaining nodes at any position other than first node traverse Till n-1 th node(nth node is the node to be deleted) and point the next pointer Of n-1 th node to the next pointer of nth node.

Function for deleting a node at given position:

```
//deleting node at position
lin_list *DeleteNodeAtPosition(lin_list *head,int position){
    lin_list *temp=head;
    lin_list *temp1;
    //linked list is empty
    if(head==NULL){
        return head;}
    //deletion of first node(head node)
    if(position==1){
        head=temp->next;
        free(temp);
        return head;
    }
    //deletion of linked list at any position except first position
    for(int i=1;i<position-1 && temp->next!=NULL;i++){
        temp=temp->next;
    }
    if(temp->next==NULL ){
        printf("invalid position\n");
        return head;
    }
    temp1=temp->next;
    temp->next=temp1->next;
    free(temp1);
    return head;}
```

Whole program:

```c
#include<stdio.h>
#include<stdlib.h>
//creating a node.
typedef struct lin_list{
    int data;
    struct lin_list *next;
}lin_list;
//inserting nodes
lin_list *insertnode(lin_list *head,int data) {
    lin_list *newnode=(lin_list*)malloc(sizeof(lin_list));
    newnode->data=data;
    newnode->next=head;
    head=newnode;
    return head;
}
//printing the linked list.
void PrintElements(lin_list *head){
    //base condition
    if(head==NULL){
        return;
    }
    printf("%d ",head->data);
    PrintElements(head->next);
}
//deleting node at position
lin_list *DeleteNodeAtPosition(lin_list *head,int position){
    lin_list *temp=head;
    lin_list *temp1;
    //linked list is empty
    if(head==NULL){
    return head;}
    //deletion of first node(head node)
    if(position==1){
        head=temp->next;
        free(temp);
        return head;
    }
    //deletion of linked list at any position except first position
    for(int i=1;i<position-1 && temp->next!=NULL;i++){
        temp=temp->next;
    }
    if(temp->next==NULL ){
        printf("invalid position\n");
        return head;
```



```
    }
    temp1=temp->next;
    temp->next=temp1->next;
    free(temp1);
    return head;
}
//main
int main(){
    lin_list *headA=NULL;
    //inserting elements into linked list
    headA=insertnode(headA,4);
    headA=insertnode(headA,3);
    headA=insertnode(headA,2);
    headA=insertnode(headA,1);
    headA=insertnode(headA,0);
    PrintElements(headA);printf("\n");
    //deleting node at a particular position
    headA=DeleteNodeAtPosition(headA,3);
    PrintElements(headA);
    return 0;
}
```

```
0 1 2 3 4
0 1 3 4
```