

# Rajalakshmi Engineering College

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## NeoColab\_REC\_CS23231\_DATA STRUCTURES

### REC\_DS using C\_Week 2\_COD\_Question 1

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Your task is to create a program to manage a playlist of items. Each item is represented as a character, and you need to implement the following operations on the playlist.

Here are the main functionalities of the program:

Insert Item: The program should allow users to add items to the front and end of the playlist. Items are represented as characters. Display Playlist: The program should display the playlist containing the items that were added.

To implement this program, a doubly linked list data structure should be used, where each node contains an item character.

**Input Format**

The input consists of a sequence of space-separated characters, representing the items to be inserted into the doubly linked list.

The input is terminated by entering - (hyphen).

### ***Output Format***

The first line of output prints "Forward Playlist: " followed by the linked list after inserting the items at the end.

The second line prints "Backward Playlist: " followed by the linked list after inserting the items at the front.

Refer to the sample output for formatting specifications.

### ***Sample Test Case***

Input: a b c -

Output: Forward Playlist: a b c

Backward Playlist: c b a

### ***Answer***

```
#include <stdio.h>
```

```
#include <stdlib.h>
```

```
struct Node {  
    char item;  
    struct Node* next;  
    struct Node* prev;  
};
```

```
void insertAtEnd(struct Node **head, char item) {  
    struct Node *newnode=(struct Node*)malloc(sizeof(struct Node*));  
    newnode->item=item;  
    newnode->prev=NULL;  
    newnode->next=NULL;  
    if(*head==NULL){  
        *head=newnode;  
    }else{  
        struct Node *pos=*head;
```

```

        while(pos->next!=NULL){
            pos=pos->next;
        }
        pos->next=newnode;
        newnode->prev=pos;
    }
}

void displayForward(struct Node* head) {
    struct Node *pos=head;
    while(pos!=NULL){
        printf(" %c ",pos->item);
        pos=pos->next;
    }
}

void displayBackward(struct Node* tail) {
    struct Node *pos=tail;

    while(pos!=NULL){
        printf(" %c ",pos->item);
        pos=pos->prev;
    }
}

void freePlaylist(struct Node* head) {
    struct Node *pos=head;
    while(pos!=NULL){
        struct Node *nextnode=pos->next;
        free(pos);
    }
}

int main() {
    struct Node* playlist = NULL;
    char item;

    while (1) {
        scanf(" %c", &item);
        if (item == '-') {
            break;
        }
        insertAtEnd(&playlist, item);
    }
}

```

```
struct Node* tail = playlist;  
while (tail->next != NULL) {  
    tail = tail->next;  
}
```

```
printf("Forward Playlist: ");  
displayForward(playlist);
```

```
printf("Backward Playlist: ");  
displayBackward(tail);
```

```
freePlaylist(playlist);
```

```
return 0;
```

**Status :** Correct

**Marks :** 10/10