Rajalakshmi Engineering College

Name: Jeevaveni S
Email: 241501076@rajalakshmi.edu.in
Roll no: 241501076
Phone: 9342214985
Branch: REC
Department: I AIML AD
Batch: 2028
Degree: B.E - AI & ML

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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

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

struct Node {
 char item;
   struct Node* next;
   struct Node* prev;
};
// You are using GCC
void insertAtEnd(struct Node** head, char item) {
  //type your code here
  struct Node *newnode;
  newnode=(struct Node*)malloc(sizeof(struct Node));
  if(newnode!=NULL){
    if(*head==NULL){
    newnode->item=item;
      newnode->next=NULL;
      newnode->prev=NULL;
```

```c
                *head=newnode;
            }
            else{
                struct Node*p;
                p=*head;
                while(p->next!=NULL)
                    p=p->next;
                newnode->item=item;
                p->next=newnode;
                newnode->next=NULL;
                newnode->prev=p;
            }
        }
    }
    void displayForward(struct Node* head) {
        //type your code here
        struct Node*p;
        p=head;
        while(p!=NULL){
            printf("%c ",p->item);
            p=p->next;
        }
        printf("\n");
    }
    void displayBackward(struct Node* tail) {
        //type your code here
        struct Node*p;
        p=tail;
        while(p!=NULL){
            printf("%c ",p->item);
            p=p->prev;
        }
    }
    void freePlaylist(struct Node* head) {
        //type your code here
        free(head);
    }

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

        while (1) {
```

```c
        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**