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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;
};

// You are using GCC
void insertAtEnd(struct Node** head, char item) {
  struct Node* newNode=(struct Node*)malloc(sizeof(struct Node));
  newNode->item=item;
  newNode->next=NULL;
  if(*head==NULL){
     newNode->prev=NULL;
     *head=newNode;
     return;
  }
  struct Node* last=*head;
  while(last->next!=NULL){
      last=last->next;
  }
  last->next=newNode;
  newNode->prev=last;
}
void displayForward(struct Node* head) {
    struct Node* current=head;
    while(current!=NULL){
        printf("%c",current->item);
        current=current->next;
    }
    printf("\n");
}

void displayBackward(struct Node* tail) {
    struct Node* current=tail;
    while(current!=NULL){
        printf("%c",current->item);
        current=current->prev;
    }
    printf("\n");
}

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



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***