Rajalakshmi Engineering College

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NeoColab_REC_CS23231_DATA STRUCTURES

REC_DS using C_Week 3_COD_Question 5

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Milton is a diligent clerk at a school who has been assigned the task of managing class schedules. The school has various sections, and Milton needs to keep track of the class schedules for each section using a stack-based system.

He uses a program that allows him to push, pop, and display class schedules for each section. Milton's program uses a stack data structure, and each class schedule is represented as a character. Help him write a program using a linked list.

Input Format

The input consists of integers corresponding to the operation that needs to be performed:

Choice 1: Push the character onto the stack. If the choice is 1, the following input is a space-separated character, representing the class schedule to be pushed onto the stack.

Choice 2: Pop class schedule from the stack

Choice 3: Display the class schedules in the stack.

Choice 4: Exit the program.

Output Format

The output displays messages according to the choice and the status of the stack:

- If the choice is 1, push the given class schedule to the stack and display the following: "Adding Section: [class schedule]"
- If the choice is 2, pop the class schedule from the stack and display the following: "Removing Section: [class schedule]"
- If the choice is 2, and if the stack is empty without any class schedules, print "Stack is empty. Cannot pop."
- If the choice is 3, print the class schedules in the stack in the following: "Enrolled Sections: " followed by the class schedules separated by space.
- If the choice is 3, and there are no class schedules in the stack, print "Stack is empty"
- If the choice is 4, exit the program and display the following: "Exiting the program"
- If any other choice is entered, print "Invalid choice"

Refer to the sample output for the exact format.

Sample Test Case

Input: 1 d
1 h
3
2

```
3
4
Output: Adding Section: d
Adding Section: h
Enrolled Sections: h d
Removing Section: h
Enrolled Sections: d
Exiting program
```

Answer

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

struct Node {
   char data;
   struct Node* next;
};

struct Node* top = NULL;

// You are using GCC
void push(char value) {
   if((value<'A'||value>'Z')&&(value<'a'||value>'z')){
      printf("Ivalid input. Only alphabetic characters are allowed.\n");
      return;
   }
   struct Node*newNode=(struct Node*)malloc(sizeof(struct Node));
   if(!newNode){
      printf("Memory allocation failed.\n");
      return;
   }
   newNode->data=value;
   newNode->next=top;
   top=newNode;
   printf("Adding section: %c\n",value);
}

void pop() {
   if(top == NULL){
      printf("Stack is empty.Cannot pop.\n");
      return;
   }
```

```
    struct Node*temp=top;
    printf("Removing Section: %c\n",top->data);
    top=top->next;
    free(temp);
}

void displayStack() {
    if(top==NULL){
        printf("Stack is empty\n");
        return;
    }
    printf("Enrolled Sections:");
    struct Node*temp=top;
    while(temp){
        printf("%c ",temp->data);
        temp=temp->next;
    }
    printf("\n");
}

int main() {
    int choice;
    char value;
    do {
        scanf("%d", &choice);
        switch (choice) {
            case 1:
                scanf(" %c", &value);
                push(value);
                break;
            case 2:
                pop();
                break;
            case 3:
                displayStack();
                break;
            case 4:
                printf("Exiting program\n");
                break;
            default:
                printf("Invalid choice\n");
        }
    } while (choice != 4);
```

```
    return 0;
}
```

Status : Correct ***Marks : 10/10***