

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

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

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

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

```
struct Node* top = NULL;
```

```
void push(char value) {  
    struct Node* newNode = (struct Node*)malloc(sizeof(struct Node));  
    if (!newNode) return; // Memory allocation check
```

```
    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* current = top;  
while (current != NULL) {  
    printf("%c", current->data);  
    if (current->next != NULL) {  
        printf(" ");  
    }  
    current = current->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