

C Program to Implement a Stack using Linked List

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*/
#include <stdio.h>
#include <stdlib.h>

struct node
{
    int info;
    struct node *ptr;
}*top,*top1,*temp;

int topelement();
void push(int data);
void pop();
void empty();
void display();
void destroy();
void stack_count();
void create();

int count = 0;

void main()
{
    int no, ch, e;

    printf("\n 1 - Push");
    printf("\n 2 - Pop");
    printf("\n 3 - Top");
    printf("\n 4 - Empty");
    printf("\n 5 - Exit");
    printf("\n 6 - Dipslay");
    printf("\n 7 - Stack Count");
    printf("\n 8 - Destroy stack");

    create();

    while (1)
    {
        printf("\n Enter choice : ");
```

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scanf("%d", &ch);

switch (ch)
{
case 1:
    printf("Enter data : ");
    scanf("%d", &no);
    push(no);
    break;
case 2:
    pop();
    break;
case 3:
    if (top == NULL)
        printf("No elements in stack");
    else
    {
        e = topelement();
        printf("\n Top element : %d", e);
    }
    break;
case 4:
    empty();
    break;
case 5:
    exit(0);
case 6:
    display();
    break;
case 7:
    stack_count();
    break;
case 8:
    destroy();
    break;
default :
    printf(" Wrong choice, Please enter correct choice ");
    break;
}
}

```

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}

/* Create empty stack */
void create()
{
    top = NULL;
}

/* Count stack elements */
void stack_count()
{
    printf("\n No. of elements in stack : %d", count);
}

/* Push data into stack */
void push(int data)
{
    if (top == NULL)
    {
        top =(struct node *)malloc(1*sizeof(struct node));
        top->ptr = NULL;
        top->info = data;
    }
    else
    {
        temp =(struct node *)malloc(1*sizeof(struct node));
        temp->ptr = top;
        temp->info = data;
        top = temp;
    }
    count++;
}

/* Display stack elements */
void display()
{
    top1 = top;

    if (top1 == NULL)
    {

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        printf("Stack is empty");
        return;
    }

    while (top1 != NULL)
    {
        printf("%d ", top1->info);
        top1 = top1->ptr;
    }
}

/* Pop Operation on stack */
void pop()
{
    top1 = top;

    if (top1 == NULL)
    {
        printf("\n Error : Trying to pop from empty stack");
        return;
    }
    else
        top1 = top1->ptr;
    printf("\n Popped value : %d", top->info);
    free(top);
    top = top1;
    count--;
}

/* Return top element */
int topelement()
{
    return(top->info);
}

/* Check if stack is empty or not */
void empty()
{
    if (top == NULL)
        printf("\n Stack is empty");
}

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    else
        printf("\n Stack is not empty with %d elements", count);
}

/* Destroy entire stack */
void destroy()
{
    top1 = top;

    while (top1 != NULL)
    {
        top1 = top->ptr;
        free(top);
        top = top1;
        top1 = top1->ptr;
    }
    free(top1);
    top = NULL;

    printf("\n All stack elements destroyed");
    count = 0;
}
```