ACPCE
Where knowledge is second nature

*Jawahar Education Society's*
*A. C. Patil College of Engineering, Kharghar*
*Navi Mumbai 410210*

Student Name: Chetan Ingale

Course Name: C.S.E. (IoT CS BC)

Year: S.E.

Roll No.: 17

PRN No.: 221111030

Course code: CSL301

Semester: 3

# Experiment Evaluation Sheet

## Experiment No.: 2

## Experiment Name:
## Write a program to implement the concept of Stack with Push, Pop, Display and Exit operations.

| Sr No. | Evaluation Criteria | Marks (Out of 9) | Performance Date | Correction Date and Signature of Instructor |
|---|---|---|---|---|
| 1 | Experiment Performance | | | |
| 2 | Journal Performance | | | |
| 3 | Punctuality | | | |
| Total | | | | |

## Code :

```
#include <stdio.h>
#define MAX_SIZE 100

struct Stack {
    int data[MAX_SIZE];
    int top;
};
void initStack(struct Stack *stack) {
    stack->top = -1;
}
int isFull(struct Stack *stack) {
    return stack->top == MAX_SIZE - 1;
}
int isEmpty(struct Stack *stack) {
    return stack->top == -1;
}
void push(struct Stack *stack, int value) {
    if (isFull(stack)) {
        printf("Stack overflow: Cannot push element %d\n", value);
    } else {
        stack->data[++stack->top] = value;
        printf("Pushed %d onto the stack.\n", value);
    }
}
int pop(struct Stack *stack) {
    if (isEmpty(stack)) {
        printf("Stack underflow: Cannot pop element.\n");
        return -1;
    } else {
        int value = stack->data[stack->top--];
        printf("Popped %d from the stack.\n", value);
        return value;
    }
}
void display(struct Stack *stack) {
    if (isEmpty(stack)) {
        printf("Stack is empty.\n");
    } else {
        printf("Stack elements: ");
        for (int i = 0; i <= stack->top; i++) {
            printf("%d ", stack->data[i]);
        }
        printf("\n");
    }
}

int main() {
    struct Stack stack;
    initStack(&stack);
    int choice, value;
    do {
        printf("\nStack Operations\n");
        printf("1. Push\n");
```

## Code :

```
        printf("2. Pop\n");
        printf("3. Display\n");
        printf("4. Exit\n");
        printf("Enter your choice: ");
        scanf("%d", &choice);

        switch (choice) {
            case 1:
                printf("Enter the value to push: ");
                scanf("%d", &value);
                push(&stack, value);
                display(&stack);
                break;
            case 2:
                pop(&stack);
                display(&stack);
                break;
            case 3:
                display(&stack);
                break;
            case 4:
                printf("Exiting the program.\n");
                break;
            default:
                printf("Invalid choice. Please try again.\n");
        }
    } while (choice != 4);
    return 0;
}
```

## Output :

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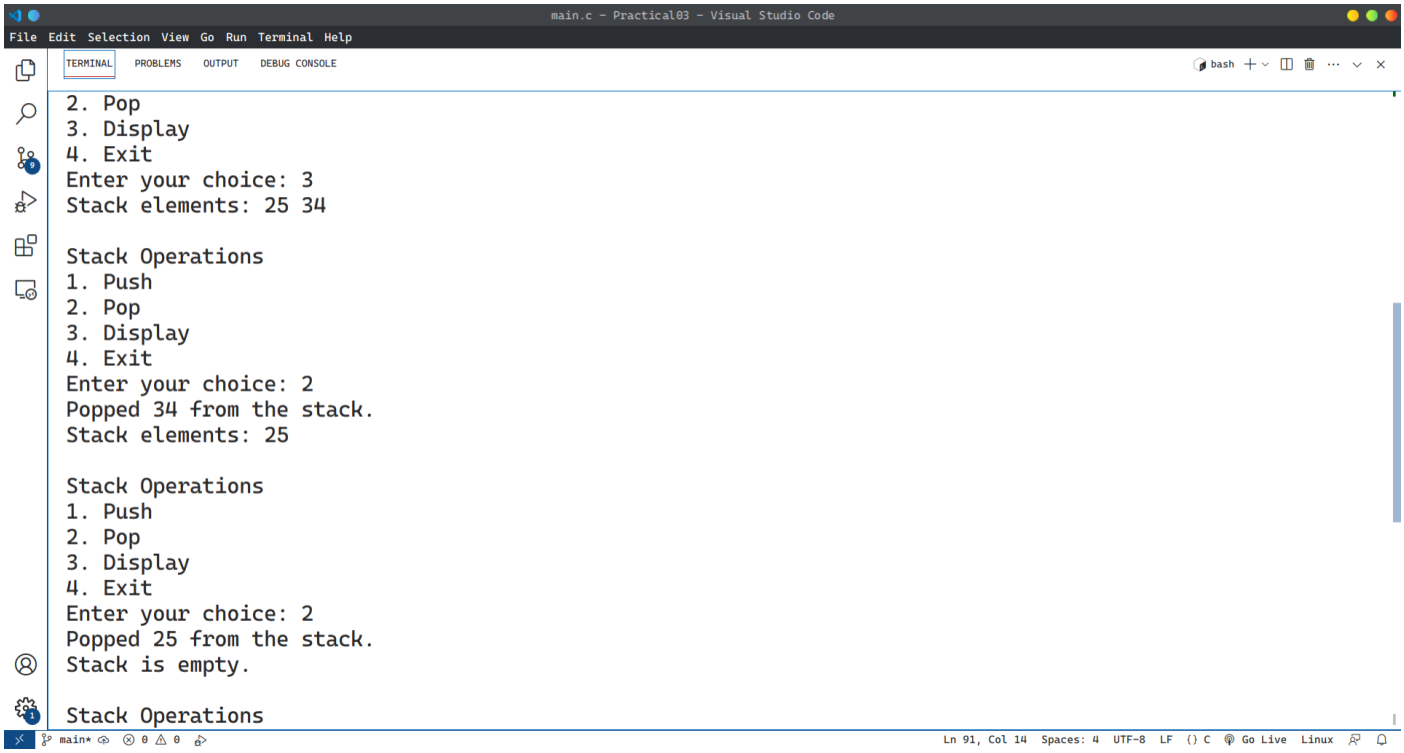


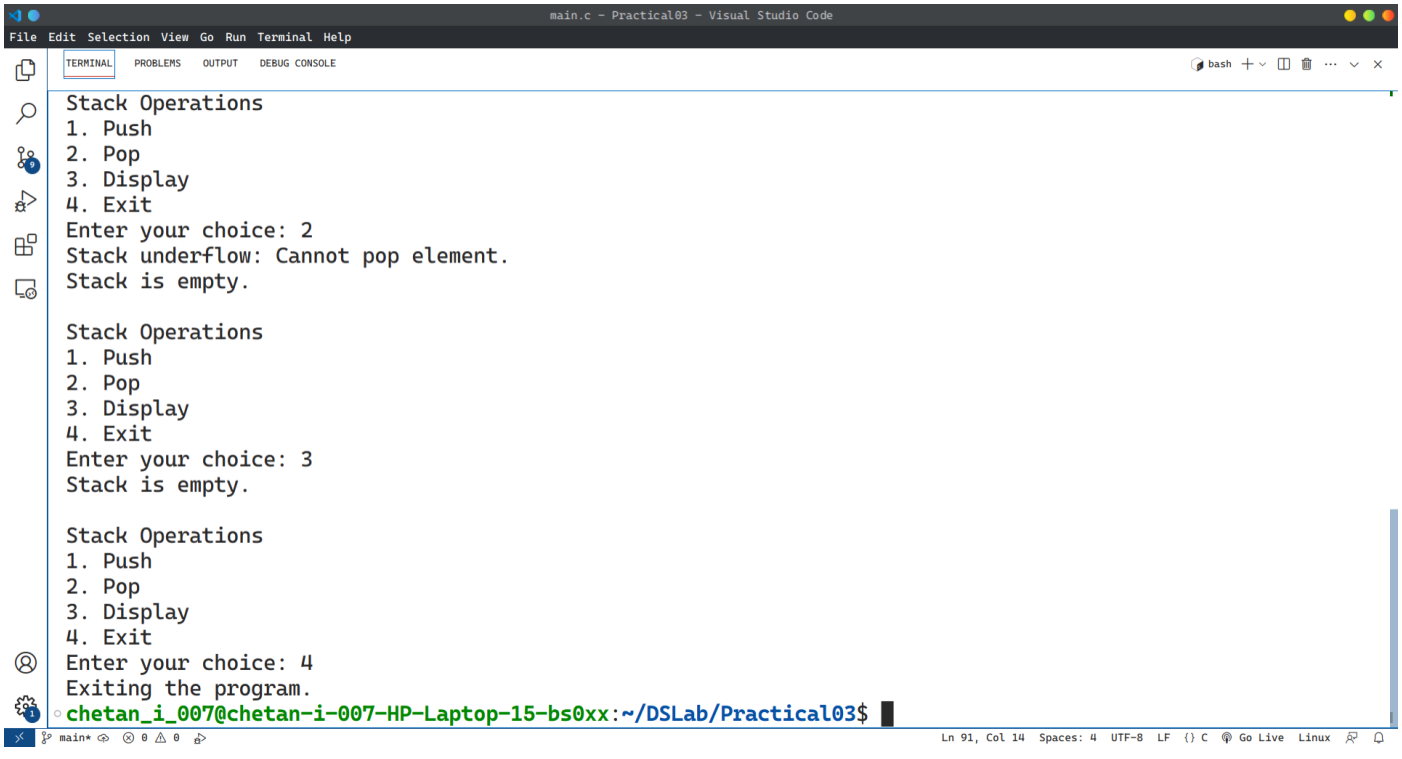


## Conclusion :

Through this experiment we have learnt about how to implement an Stack using the C language.
Various operations like push, pop, isfull, and isempty are applied on the stack.
This experiment helps us in using stacks as a data structure for further reference.