

CSA0317-DATA STRUCTURES

Program 11

```
#include <stdio.h>
#include <stdlib.h>
#define MAX 5 // maximum size of stack
int stack[MAX];
int top = -1;
// Function to push an element
void push(int value) {
    if (top == MAX - 1) {
        printf("Stack Overflow! Cannot push %d\n", value);
    } else {
        stack[++top] = value;
        printf("%d pushed into stack\n", value);
    }
}
// Function to pop an element
void pop() {
    if (top == -1) {
        printf("Stack Underflow! Cannot pop\n");
    } else {
        printf("%d popped from stack\n", stack[top--]);
    }
}
// Function to peek (top element)
void peek() {
    if (top == -1) {
        printf("Stack is empty\n");
    } else {
```

```

        printf("Top element: %d\n", stack[top]);
    }
}

void display() {
    if (top == -1) {
        printf("Stack is empty\n");
    } else {
        printf("Stack elements: ");
        for (int i = top; i >= 0; i--) {
            printf("%d ", stack[i]);
        }
        printf("\n");
    }
}

int main() {
    int choice, value;

    while (1) {
        printf("\n--- Stack Menu ---\n");
        printf("1. PUSH\n");
        printf("2. POP\n");
        printf("3. PEEK\n");
        printf("4. DISPLAY\n");
        printf("5. EXIT\n");
        printf("Enter your choice (1-5): ");
        scanf("%d", &choice);

        switch (choice) {
            case 1:
                printf("Enter value to push: ");
                scanf("%d", &value);
                push(value);

```

```
        break;
case 2:
    pop();
    break;
case 3:
    peek();
    break;
case 4:
    display();
    break;
case 5:
    printf("Exiting program...\n");
    exit(0);
default:
    printf("Invalid choice! Please enter 1-5.\n");
}
}
return 0;
}
```

Output:

```
Output Clear

--- Stack Menu ---
1. PUSH
2. POP
3. PEEK
4. DISPLAY
5. EXIT
Enter your choice (1-5): 1
Enter value to push: 5
5 pushed into stack

--- Stack Menu ---
1. PUSH
2. POP
3. PEEK
4. DISPLAY
5. EXIT
Enter your choice (1-5): 1
Enter value to push: 6
6 pushed into stack

--- Stack Menu ---
1. PUSH
2. POP
3. PEEK
4. DISPLAY
5. EXIT
Enter your choice (1-5): 2
6 popped from stack

--- Stack Menu ---
1. PUSH
2. POP
3. PEEK
4. DISPLAY
5. EXIT
Enter your choice (1-5): 3
Top element: 5

--- Stack Menu ---
1. PUSH
2. POP
3. PEEK
4. DISPLAY
5. EXIT
Enter your choice (1-5): |
```