

LAB PROGRAM-1

Write a program to simulate the working of stack using an array with the following:

a) Push

b) Pop

c) Display

The program should print appropriate messages for stack overflow, stack underflow

```
#include <stdio.h>

#define SIZE 5

int stack[SIZE];
int top = -1;

void push() {
    int value;
    if (top == SIZE - 1) {
        printf("\nStack Overflow! Cannot push more elements.\n");
    } else {
        printf("Enter the value to push: ");
        scanf("%d", &value);
        top++;
        stack[top] = value;
        printf("%d pushed into the stack.\n", value);
    }
}

void pop() {
    if (top == -1) {
        printf("\nStack Underflow! No elements to pop.\n");
    } else {
        printf("%d popped from the stack.\n", stack[top]);
    }
}
```

```
top--;
}

}

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

int main() {
    int choice;
    while (1) {
        printf("\n--- Stack Menu ---\n");
        printf("1. Push\n2. Pop\n3. Display\n4. Exit\n");
        printf("Enter your choice: ");
        scanf("%d", &choice);

        switch (choice) {
            case 1: push(); break;
            case 2: pop(); break;
            case 3: display(); break;
            case 4: printf("Exiting...\n"); return 0;
            default: printf("Invalid choice! Try again.\n");
        }
    }
}
```

OUTPUT:

```
↑ --- Stack Menu ---  
↓ 1. Push  
→ 2. Pop  
← 3. Display  
↓ 4. Exit  
→ Enter your choice:1  
↓  
→ Enter the value to push:22  
↓  
→ 22 pushed into the stack.  
  
↑ --- Stack Menu ---  
↓ 1. Push  
→ 2. Pop  
← 3. Display  
↓ 4. Exit  
→ Enter your choice:1  
↓  
→ Enter the value to push:34  
↓  
→ 34 pushed into the stack.]
```

```
↑ --- Stack Menu ---  
↓ 1. Push  
→ 2. Pop  
← 3. Display  
↓ 4. Exit  
→ Enter your choice:1  
↓  
→ Enter the value to push:66  
↓  
→ 66 pushed into the stack.  
  
↑ --- Stack Menu ---  
↓ 1. Push  
→ 2. Pop  
← 3. Display  
↓ 4. Exit  
→ Enter your choice:2  
↓  
→ 66 popped from the stack.
```

```
↓ --- Stack Menu ---  
→ 1. Push  
← 2. Pop  
→ 3. Display  
↓ 4. Exit  
→ Enter your choice:3  
  
↓  
→ Stack elements are:  
34  
22  
  
↓ --- Stack Menu ---  
→ 1. Push  
← 2. Pop  
→ 3. Display  
↓ 4. Exit  
→ Enter your choice:4  
  
↓  
→ Exiting...
```