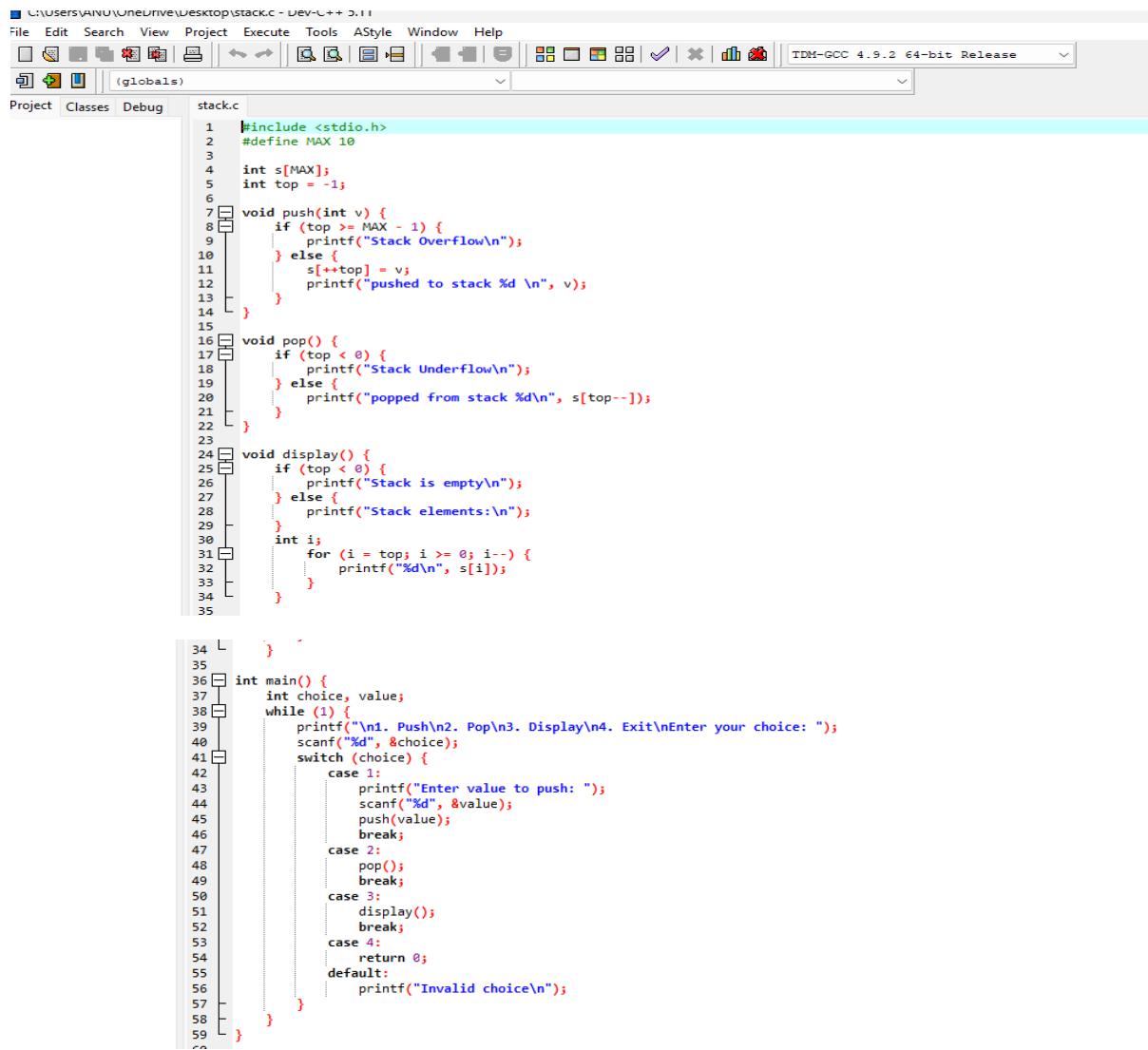


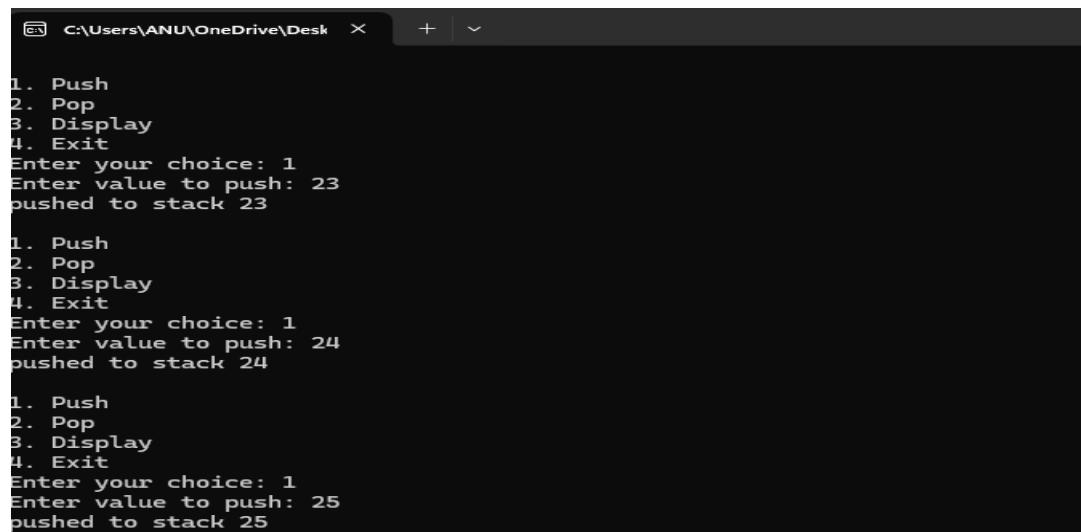
Program 1:



The screenshot shows the Dev-C++ IDE interface with the file 'stack.c' open. The code implements a stack using an array 's' and a pointer 'top'. It includes functions for pushing values onto the stack, popping values from it, and displaying the current stack elements. The main function provides a menu for the user to choose between Push, Pop, Display, and Exit operations.

```
#include <stdio.h>
#define MAX 10
int s[MAX];
int top = -1;
void push(int v) {
    if (top >= MAX - 1) {
        printf("Stack Overflow\n");
    } else {
        s[++top] = v;
        printf("pushed to stack %d \n", v);
    }
}
void pop() {
    if (top < 0) {
        printf("Stack Underflow\n");
    } else {
        printf("popped from stack %d\n", s[top--]);
    }
}
void display() {
    if (top < 0) {
        printf("Stack is empty\n");
    } else {
        printf("Stack elements:\n");
        int i;
        for (i = top; i >= 0; i--) {
            printf("%d\n", s[i]);
        }
    }
}
int main() {
    int choice, value;
    while (1) {
        printf("\n1. Push\n2. Pop\n3. Display\n4. Exit\nEnter your choice: ");
        scanf("%d", &choice);
        switch (choice) {
            case 1:
                printf("Enter value to push: ");
                scanf("%d", &value);
                push(value);
                break;
            case 2:
                pop();
                break;
            case 3:
                display();
                break;
            case 4:
                return 0;
            default:
                printf("Invalid choice\n");
        }
    }
}
```

Output:



The terminal window displays the execution of the program. It shows three separate runs of the menu. In each run, the user selects option 1 (Push), enters a value (23, 24, and 25 respectively), and the program outputs that the value has been pushed onto the stack.

```
1. Push
2. Pop
3. Display
4. Exit
Enter your choice: 1
Enter value to push: 23
pushed to stack 23

1. Push
2. Pop
3. Display
4. Exit
Enter your choice: 1
Enter value to push: 24
pushed to stack 24

1. Push
2. Pop
3. Display
4. Exit
Enter your choice: 1
Enter value to push: 25
pushed to stack 25
```

```
1. Push  
2. Pop  
3. Display  
4. Exit
```

```
Enter your choice: 2  
popped from stack 25
```

```
1. Push  
2. Pop  
3. Display  
4. Exit
```

```
Enter your choice: 3  
Stack elements:
```

```
24  
23
```

```
1. Push  
2. Pop  
3. Display  
4. Exit
```

```
Enter your choice: 4
```

```
Process exited after 210.2 seconds with return value 0  
Press any key to continue . . .
```