

Program 1 - Implementing stack operations.

```
#include <stdio.h>
#define N 5
int stack[N];
int top = -1;
void push()
{
    int n, x;
    printf("How many elements do you want to push");
    scanf("%d", &n);
    if (n > (N - top + 1))
    {
        printf("Stack Overflow");
        return;
    }
    printf("Enter %d elements : \n", n);
    for (int i = 0; i < n; i++)
    {
        scanf("%d", &x);
        top++;
        stack[top] = x;
    }
    printf("Elements pushed into the stack \n");
}
void pop()
{
    if (top == -1)
    {
        printf("Stack Underflow");
    }
    else
    {
        printf("%d popped out from stack. \n", stack[top]);
        top--;
    }
}
```

```

void peek()
{ if (top == -1) {
    printf("Stack underflow");
} else {
    printf("Top element : %d\n", stack[top]);
}
}

```

```

void display()
{ if (top == -1) {
    printf("Stack underflow");
} else {
    printf("Stack elements from top to bottom are: \n");
    for (int i = top; i >= 0; i--) {
        printf("%d\t", stack[i]);
    }
    printf("\n");
}
}

```

```

int main()
{ int ch;
  do {
    printf("Enter your choice: 1. push 2. pop 3. peek 4. display\n");
    scanf("%d", &ch);
    switch (ch) {
        case 1: push(); break;
        case 2: pop(); break;
        case 3: peek(); break;
        case 4: display(); break;
        case 0: printf("Exiting"); break;
    }
  }
}

```

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    default : printf("Invalid choice\n");
  }
  while (ch != 0);
  return 0;
}

```

Output: Enter your choice : 1. push 2. pop 3. peek 4. display 0. exit

1

How many elements do you want to push

6

Stack overflow

Enter your choice : 1. push 2. pop 3. peek 4. display 0. exit

1

How many elements do you want to push

2

Enter 2 elements

1
2

Elements are pushed into the stack.

Enter your choice : 1. push 2. pop 3. peek 4. display 0. exit

2

2 is popped out of the stack

Enter your choice : 1. push 2. pop 3. peek 4. display 0. exit

2

1 is popped out of the stack

Enter your choice : 1. push 2. pop 3. peek 4. display 0. exit

2

Stack Underflow

Enter your choice : 1. push 2. pop 3. peek 4. display 0. exit

1

How many elements do you want to push :

3

Enter 3 elements

2

3

Elements are pushed into the stack

Enter your choice : 1. push 2. pop 3. peek 4. display 0. exit

3

Top element is : 3

Enter your choice : 1. push 2. pop 3. peek 4. display 0. exit

4

3 2 1

Enter your choice : 1. push 2. pop 3. peek 4. display 0. exit

0

Exiting the program

10/10