**#3. Stack**

**Roll Number: CB.EN.P2EBS22001**

**Date of Submission: 19-11-2022**

**Aim:**

To perform following Stack operations using C Programming:

1. Stack Creation
2. Push an element
3. Pop an element
4. Peek the stack
5. Check the status of the stack full/empty
6. View the entire stack after each of the above operation

**Tools Required:**

Text editor with C Compiler.

**Experiment:**

Code

#include <stdio.h>

#include <stdlib.h>

typedef struct stack1

{

    int top;

    unsigned int size;

    int \*array;

}S1;

 struct stack1 create(unsigned int n)

 {

     S1 \*sp1;

     sp1=(struct stack1\*)malloc(sizeof (struct stack1));

     sp1->array=(int\*)malloc(n\*sizeof (int));

     sp1->top=-1;

     sp1->size=n;

     return \*sp1;

 }

 int isfull(S1 \*s1)

 {

     if(s1->top==s1->size-1){

         printf("\n\n----------Cannot enter the element: Stack is full------------------\n\n");

        return 0;

     }

     else{

        printf("stack is not full\n");

        return 1;

     }

}

 int isEmpty(S1 \*s1){

     if(s1->top==-1){

        printf("\n\n-------------------Stack is Empty----------------\n\n");

        return 0;

     }

     else{

         printf("\n| Stack is not empty |\n");

        return 1;

     }

}

 void push(S1 \*s1)

 {

    if(isfull(s1))

    {

      int number,a;

      printf("Enter the element:");

      scanf("%d",&number);

      s1->array[++s1->top]=number;

   }

}

void pop(S1 \*s1){

   if(isEmpty(s1)){

     printf("%d removed at positon %d",s1->array[s1->top],s1->top);

     s1->top=s1->top-1;

   }

}

void peek(S1 \*s1){

    int peekValue;

    printf("Enter the stack element to be viewed:");

    scanf("%d",&peekValue);

    printf("%d",s1->array[peekValue]);

}

void stackView(S1 \*s1){

    int i;

     for (i=s1->size;i>=0;i--){

        printf("\n%d\n", s1->array[i]);

    }

}

int main()

{

    S1 \*s1;

    unsigned int n,userInput;

    int i;

    printf("\nEnter size of the stack:");

    scanf("%d", &n);

    \*s1=create(n);

    while(1){

        printf("\n======================OPTIONS=========================");

        printf("\n1-Push\n2-Pop\n3-Peek\n4-isFull()\n5-isEmpty()\n6-View Stack\n7-Exit\n");

        printf("Enter the option:");

        scanf("%d",&userInput);

        switch(userInput){

            case 1:push(s1);

                   break;

            case 2:pop(s1);

                   break;

            case 3:peek(s1);

                   break;

            case 4:isfull(s1);

                   break;

            case 5:isEmpty(s1);

                   break;

            case 6:

            printf("-------STACK--------\n");

            stackView(s1);

            case 7: break;

            default: printf("Enter a valid number");

        }

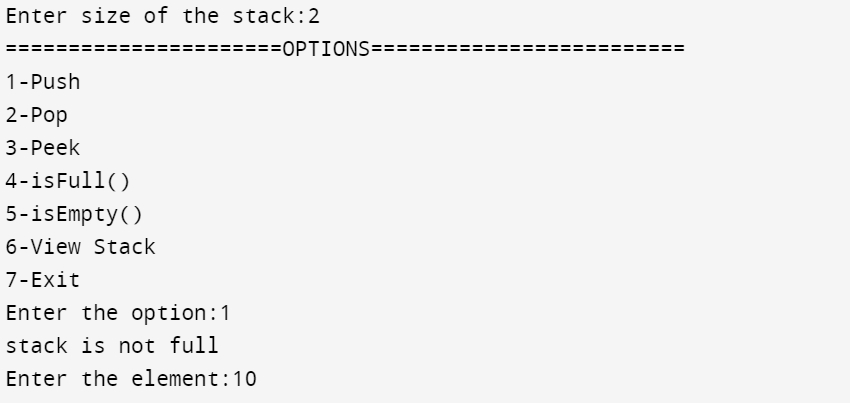
    }

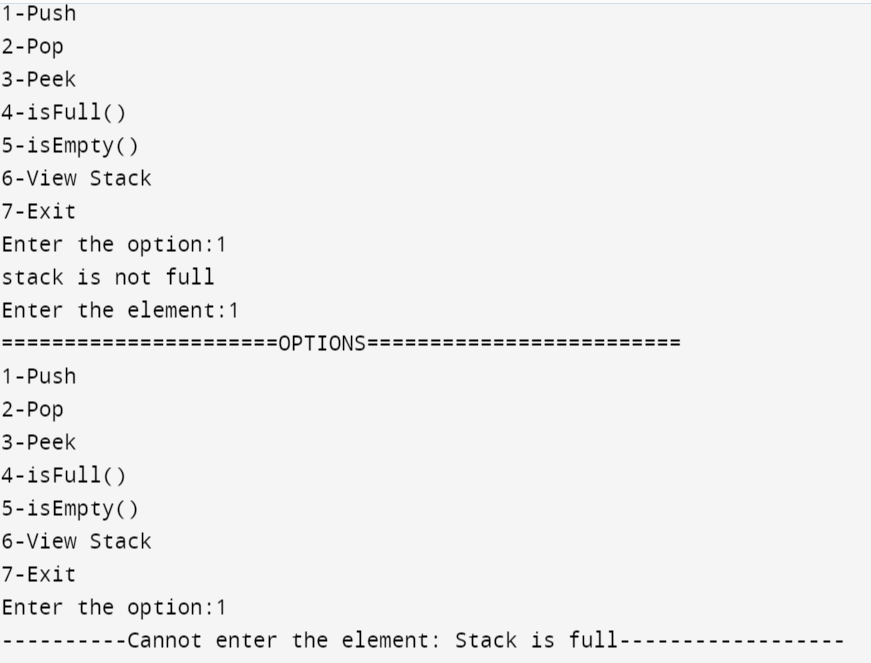
    return 0;

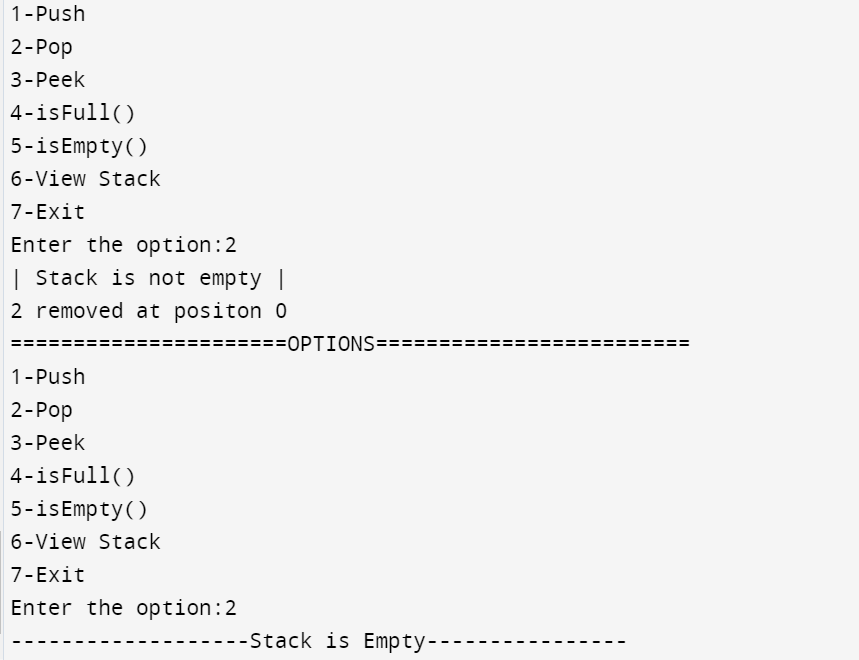
}

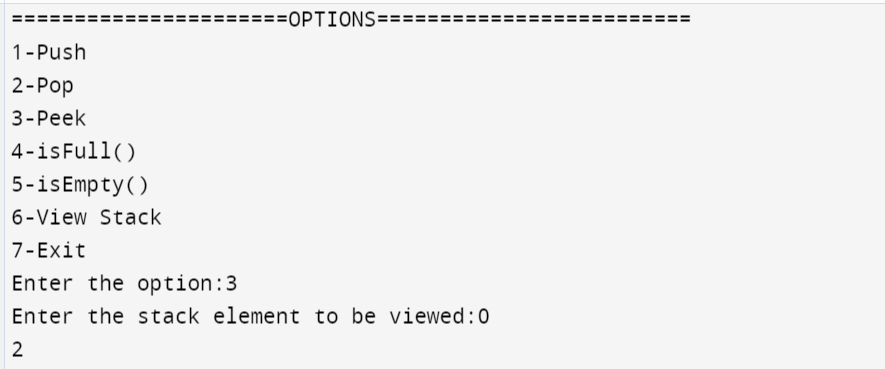
Result

1. Push

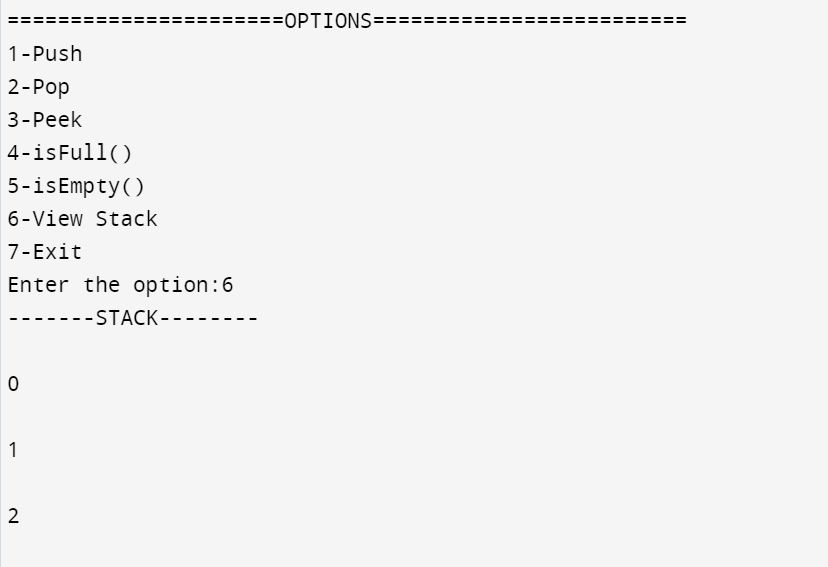




1. Pop
2. Peek



1. View Stack



**Inference and Result:**

Stack is implemented in C and stack operations are performed and result is observed.