Experiment No. 01

Implementation of Stack using Array for real-world application.

IT-Sem3-Datastructure Lab-1-Chirayu Agrawal

Source Code: -

```c
#include <stdio.h>
int STK[100], TOP = -1, i, n, x, choice;
void Push();
void Pop();
void Peep();
void change();
void Display();
clrscr();
void main()
{
    printf("\t WELCOME to Implementation of STACK using array !! \n");
    printf("Enter the size of Stack (Maximum size = 100): ");
    scanf("%d", &n);

    do
    {
        printf("\n Stack Operation available: \n");
        printf("\t1.Push\t 2.Pop\t 3.Peep\t 4.Display\t 5.Exit \n");
        printf("\n Enter your choice: ");
        scanf("%d", &choice);
        switch (choice)
        {
        case 1:
            Push();
            break;
        case 2:
            Pop();
            break;
        case 3:
            Peep();
            break;
        case 4:
            Display();
            break;
        case 5:
            printf("Exit: Program Finished !! ");
            break;
        default:
            printf("Please enter a valid choide: 1, 2, 3, 4, 5 \n");
        }
    } while (choice != 5);
}

// Function to perform PUSH Operation
void Push()
{
    if (TOP >= n - 1)
    {
        printf(" Stack Overflow \n");
    }
    else
    {
```

```
53          printf(" Enter the element to be pushed: ");
54          scanf("%d", &x);
55          TOP++;
56          STK[TOP] = x;
57      }
58  }
59
60  // Function to perform POP Operation
61  void Pop()
62  {
63      if (TOP < 0)
64      {
65          printf(" Stack Underflow \n");
66      }
67      else
68      {
69          printf(" The popped element is: %d \n", STK[TOP]);
70          TOP--;
71      }
72  }
73
74  // Function to perform PEEP Opeartion
75  void Peep()
76  {
77      printf(" Enter the position of the element from the top which you want to
            peep: ");
78      scanf("%d", &i);
79      if (TOP - i + 1 < 0)
80      {
81          printf(" Stack Underflow on Peep \n");
82      }
83      else
84      {
85          printf(" The %d element from the top is: %d \n", i, STK[TOP - i + 1]);
86      }
87  }
88
89  // Function to DISPLAY the Stack
90  void Display()
91  {
92      if (TOP < 0)
93      {
94          printf(" Stack is empty \n");
95      }
96      else
97      {
98          printf(" The element in the stack are:");
99          for (i = TOP; i > -1; i--)
100         {
101             printf("\n %d \n", STK[i]);
102         }
103     }
104 }
```

Output: -

Output Clear

```
/tmp/T8z3Wk85TS.o
WELCOME to Implementation of STACK using array !!
Enter the size of Stack (Maximum size = 100): 6
Stack Operation available:
    1.Push   2.Pop   3.Peep  4.Display   5.Exit

 Enter your choice: 4
 Stack is empty

 Stack Operation available:
    1.Push   2.Pop   3.Peep  4.Display   5.Exit

 Enter your choice: 1
 Enter the element to be pushed: 1
 Stack Operation available:
    1.Push   2.Pop   3.Peep  4.Display   5.Exit

Enter your choice: 1
Enter the element to be pushed: 2
Stack Operation available:
    1.Push   2.Pop   3.Peep  4.Display   5.Exit

 Enter your choice: 1
 Enter the element to be pushed: 3
 Stack Operation available:
    1.Push   2.Pop   3.Peep  4.Display   5.Exit
```

```
 Enter your choice: 1
 Enter the element to be pushed: 4
 Stack Operation available:
    1.Push   2.Pop   3.Peep  4.Display   5.Exit

 Enter your choice: 1
 Enter the element to be pushed: 5
 Stack Operation available:
1.Push   2.Pop   3.Peep  4.Display   5.Exit

 Enter your choice: 1
 Enter the element to be pushed: 6
 Stack Operation available:
    1.Push   2.Pop   3.Peep  4.Display   5.Exit

 Enter your choice: 2
 The popped element is: 6

 Stack Operation available:
    1.Push   2.Pop   3.Peep  4.Display   5.Exit

 Enter your choice: 6
 Please enter a valid choide: 1, 2, 3, 4, 5

 Stack Operation available:
    1.Push   2.Pop   3.Peep  4.Display   5.Exit

Enter your choice: 3
Enter the position of the element from the top which you want to peep: 4
The 4 element from the top is: 2

Stack Operation available:
   1.Push   2.Pop   3.Peep  4.Display   5.Exit

Enter your choice: 4
The element in the stack are:
5

4

3

2

1

Stack Operation available:
   1.Push   2.Pop   3.Peep  4.Display   5.Exit

Enter your choice: 5
Exit: Program Finished !!
```