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1/*Assignment01-Q4
2*AIM :Create a application that implements a stack using
   an array.
3*NAME:SAGARIKA SRIVASTAVA
4*UIN : 231P047
5*ROLL NO : 44
6*Div :A
7*/
8package JAVA_EXPS ;
9import java.util.Scanner;
10class Stack
11{
12private int[] stack;
13private int top;
14private int maxSize;
15public Stack(int size)
16{
17    maxSize = size;
18    stack = new int[maxSize];
19    top = -1;
20}
21public void push(int value)
22{
23    if (top == maxSize - 1)
24    {
25        System.out.println("Stack is full! Cannot push " +
value);
26    }
27    else
28    {
29        stack[++top] = value;
30        System.out.println(value + " pushed to stack.");
31    }
32}
```

```
33 public int pop()
34 {
35     if (isEmpty())
36     {
37         System.out.println("Stack is empty! Cannot pop.");
38         return -1;
39     }
40     else
41     {
42         return stack[top--];
43     }
44 }
45 public int peek()
46 {
47     if (isEmpty())
48     {
49         System.out.println("Stack is empty! Cannot
peek."); return -1;
50     }
51     else
52     {
53         return stack[top];
54     }
55 }
56
57 public boolean isEmpty()
58 {
59     return top == -1;
60 }
61
62 public void display()
63 {
64     if (isEmpty())
65     {
```

```
66         System.out.println("Stack is empty.");
67     }
68     else
69     {
70         System.out.print("Stack elements: ");
71         for (int i = top; i >= 0; i--)
72         {
73             System.out.print(stack[i] + " ");
74         }
75         System.out.println();
76     }
77 }
78 }
79
80 public class StackApp {
81     public static void main(String[] args) {
82
83         Scanner scanner = new Scanner(System.in);
84
85         System.out.print("Enter stack size: ");
86         int size = scanner.nextInt();
87         Stack stack = new Stack(size);
88
89         while (true)
90         {
91             System.out.println("\nStack Operations Menu");
92             System.out.println("1.Push");
93             System.out.println("2.Pop");
94             System.out.println("3.Peek");
95             System.out.println("4.Check if Empty");
96             System.out.println("5.Display Stack");
97             System.out.println("6.Exit");
98
99             System.out.print("Choose an option:");
```

```
100         int choice = scanner.nextInt();
101
102     switch (choice)
103     {
104         case 1:
105             System.out.print("Enter a number to push: ");
106             int value = scanner.nextInt();
107             stack.push(value);
108             break;
109
110         case 2:
111             int poppedValue = stack.pop();
112             if (poppedValue != -1)
113             {
114                 System.out.println("Popped value: " +
115 poppedValue);
116             }
117             break;
118
119         case 3:
120             int topValue = stack.peek();
121             if (topValue != -1)
122             {
123                 System.out.println("Top value: " +
124 topValue);
125             }
126             break;
127
128         case 4:
129             System.out.println("Is stack empty? " +
130 stack.isEmpty());
131             break;
132
133         case 5:
```

```
131         stack.display();
132         break;
133
134         case 6:
135             System.out.println("\nThank You!");
136             System.out.println("\nName:SAGARIKA SRIVASTAVA
\nUIN:231P047\nROLL NO:44\n");
137             scanner.close();
138             return;
139
140         default:
141             System.out.println("Invalid choice! Please
choose a valid option.");
142
143     }
144 }
145 }
146 }
```