1) ArrayList Demo

```
2) import java.util.*;
3)
4) public class ArrayListDemo {
5)
6)     public static int find(List<Employee> e, int empno) {
7)         int pos = -1;
8)         for (int i = 0; i < e.size(); i++) {
9)             Employee emp = e.get(i);
10)            if (emp.getEmpno() == empno) {
11)                pos = i;
12)                break;
13)            }
14)        }
15)        return pos;
16)    }
17)
18)    public static void insert(List<Employee> e) {
19)        Scanner sin = new Scanner(System.in);
20)        int empno, salary;
21)        String name;
22)
23)        System.out.print("Enter empno : ");
24)        empno = Integer.parseInt(sin.nextLine());
25)
26)        System.out.print("Enter name : ");
27)        name = sin.nextLine();
28)
29)        System.out.print("Enter salary : ");
30)        salary = Integer.parseInt(sin.nextLine());
31)
32)        Employee emp = new Employee(empno, name, salary);
33)
34)        e.add(new Employee(empno, name, salary));
35)    }
36)
37)    public static void display(List<Employee> e) {
38)        Iterator itr = e.iterator();
39)        while (itr.hasNext()) {
40)            System.out.println(itr.next());
41)        }
42)    }
43)
44)    public static void search(List<Employee> e) {
45)        Scanner sin = new Scanner(System.in);
46)        int empno;
47)        System.out.print("enter empno : ");
48)        empno = Integer.parseInt(sin.nextLine());
49)        ;
50)        int pos = find(e, empno);
51)        if (pos == -1) {
52)            System.out.println("Employee not found!!!");
53)        } else {
54)            System.out.println(e.get(pos));
55)        }
56)    }
57)
58)    public static void delete(List<Employee> e) {
```

```
59)         Scanner sin = new Scanner(System.in);
60)         int empno;
61)         System.out.print("enter empno : ");
62)         empno = Integer.parseInt(sin.nextLine());
63)         ;
64)         int pos = find(e, empno);
65)         if (pos == -1) {
66)             System.out.println("Employee not found!!!");
67)         } else {
68)             e.remove(pos);
69)             System.out.println("Employee successfully deleted");
70)         }
71)     }
72)
73)     public static void update(List<Employee> e) {
74)         Scanner sin = new Scanner(System.in);
75)         int empno;
76)         System.out.print("enter empno : ");
77)         empno = Integer.parseInt(sin.nextLine());
78)         ;
79)         int pos = find(e, empno);
80)         if (pos == -1) {
81)             System.out.println("Employee not found!!!");
82)         } else {
83)             String name;
84)             int salary;
85)             System.out.print("Enter new name : ");
86)             name = sin.nextLine();
87)             System.out.print("Enter new salary : ");
88)             salary = Integer.parseInt(sin.nextLine());
89)             ;
90)
91)             e.set(pos, new Employee(empno, name, salary));
92)
93)             System.out.println("Employee updated successfully");
94)         }
95)     }
96)
97)     public static void main(String[] args) {
98)         Scanner in = new Scanner(System.in);
99)
100)            int choice = -1;
101)
102)            List<Employee> employees = new ArrayList<>();
103)
104)            while (true) {
105)                System.out.println("Enter 1 to insert");
106)                System.out.println("Enter 2 to display");
107)                System.out.println("Enter 3 to search");
108)                System.out.println("Enter 4 to delete");
109)                System.out.println("Enter 5 to update");
110)                System.out.println("Enter 0 to exit");
111)                System.out.print("Enter choice : ");
112)                choice = Integer.parseInt(in.nextLine());
113)                ;
114)
115)                switch (choice) {
116)                    case 1:
```

```
                        insert(employees);
                        break;
                    case 2:
                        display(employees);
                        break;
                    case 3:
                        search(employees);
                        break;
                    case 4:
                        delete(employees);
                        break;
                    case 5:
                        update(employees);
                        break;

                    case 0:
                        System.exit(0);

                    default:
                        break;
                }
            }

        }

    }

```

Output :

```
tailsInExceptionMessages' '-cp' 'C:\Users\swai
ignments_fc3a473c\bin' 'day6.ArrayListDemo'
Enter 1 to insert
Enter 2 to display
Enter 3 to search
Enter 4 to delete
Enter 5 to update
Enter 0 to exit
Enter choice : 1
Enter empno : 101
Enter name : a
Enter salary : 250
Enter 1 to insert
Enter 2 to display
Enter 3 to search
Enter 4 to delete
Enter 5 to update
Enter 0 to exit
Enter choice : 1
Enter empno : 202
Enter name : b
Enter salary : 560
Enter 1 to insert
Enter 2 to display
Enter 3 to search
Enter 4 to delete
Enter 5 to update
Enter 0 to exit
Enter choice : 2
Employee [empno=101, name=a, salary=250]
Employee [empno=202, name=b, salary=560]
Enter 1 to insert
Enter 2 to display
Enter 3 to search
Enter 4 to delete
Enter 5 to update
Enter 0 to exit
Enter choice : 3
enter empno : 101
Employee [empno=101, name=a, salary=250]
Enter 1 to insert
Enter 2 to display
Enter 3 to search
Enter 4 to delete
Enter 5 to update
Enter 0 to exit
Enter choice : 3
enter empno : 404
Employee not found!!!
Enter 1 to insert
Enter 2 to display
Enter 3 to search
Enter 4 to delete
Enter 5 to update
Enter 0 to exit
Enter choice : 4
enter empno : 101
```

```
Employee successfully deleted
Enter 1 to insert
Enter 2 to display
Enter 3 to search
Enter 4 to delete
Enter 5 to update
Enter 0 to exit
Enter choice : 2
Employee [empno=202, name=b, salary=560]
Enter 1 to insert
Enter 2 to display
Enter 3 to search
Enter 4 to delete
Enter 5 to update
Enter 0 to exit
Enter choice : 5
enter empno : 202
Enter new name : newName
Enter new salary : 450
Employee updated successfully
Enter 1 to insert
Enter 2 to display
Enter 3 to search
Enter 4 to delete
Enter 5 to update
Enter 0 to exit
Enter choice : 2
Employee [empno=202, name=newName, salary=450]
```

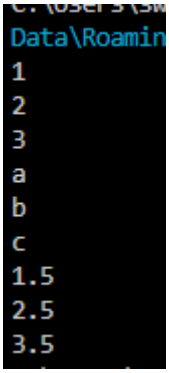
144) Generic Class

```java
public class Generic<T> {
    T container;

    public Generic() {
        super();
    }

    public Generic(T container) {
        this.container = container;
    }

    public Object getValue() {
        return this.container;
    }

}
```

TesterClass

```java
public class AssignmentGenerics {
    public static<T> void print(Generic<T[]> a) {
        for(T obj : a.container) {
            System.out.println(obj);
        }
    }

    Run | Debug
    public static void main(String[] args) {
        Generic<Integer[]> a = new Generic<Integer[]>();
        Generic<String[]> b = new Generic<String[]>();
        Generic<Double[]> c = new Generic<Double[]>();

        Integer Iarr[] = new Integer[]{1, 2, 3};
        String Sarr[] = new String[] {"a", "b", "c"};
        Double Darr[] = new Double[] {1.5, 2.5, 3.5};

        a.container = Iarr;
        b.container = Sarr;
        c.container = Darr;

        print(a);
        print(b);
        print(c);
    }

}
```

Output:



145) MyCalculator GUI Program

```
import java.awt.*;
import java.awt.event.*;

import javax.swing.*;

public class MyCalculator implements ActionListener {

    JFrame f;
    JTextField t;
    JButton b1, b2, b3, b4, b5, b6, b7, b8, b9, b0, badd, bsub, bdiv, bmul,
bdec, beq, bdel, bclr;

    static double a = 0.0d, b = 0.0d, result = 0.0d;
    static String operator = "";

    public static boolean checkForOpeators(String s) {
        boolean ok = false;
        for (int i = 0; i < s.length(); i++) {
            if (s.charAt(i) == '+' || s.charAt(i) == '-' || s.charAt(i) == '*'
|| s.charAt(i) == '/') {
                ok = true;
                break;
            }
        }
        return ok;
    }

    public static void calculateResult() {
        switch (operator) {
            case "+":
                result = a + b;
                break;
            case "-":
                result = a - b;
                break;
            case "*":
                result = a * b;
                break;
            case "/":
                result = a / b;
```

```
                break;
            default:
                result = a;
        }
    }

    public MyCalculator() {
        f = new JFrame("My Calculator");
        f.setVisible(true);
        f.setLayout(null);
        f.setBounds(20, 20, 300, 350);
        f.setResizable(false);

        Font fo = new Font("Arial", Font.BOLD, 20);

        t = new JTextField();
        t.setFont(fo);
        t.setBackground(Color.LIGHT_GRAY);
        t.setForeground(Color.BLACK);
        t.setBounds(40, 40, 200, 50);

        b1 = new JButton("1");
        b2 = new JButton("2");
        b3 = new JButton("3");
        b4 = new JButton("4");
        b5 = new JButton("5");
        b6 = new JButton("6");
        b7 = new JButton("7");
        b8 = new JButton("8");
        b9 = new JButton("9");
        b0 = new JButton("0");
        badd = new JButton("+");
        bsub = new JButton("-");
        bdiv = new JButton("/");
        bmul = new JButton("*");
        bdec = new JButton(".");
        beq = new JButton("=");
        bdel = new JButton("DEL");
        bclr = new JButton("CLR");

        b7.setBounds(40, 100, 50, 40);
        b8.setBounds(90, 100, 50, 40);
        b9.setBounds(140, 100, 50, 40);
        bdiv.setBounds(190, 100, 50, 40);

        b4.setBounds(40, 140, 50, 40);
        b5.setBounds(90, 140, 50, 40);
        b6.setBounds(140, 140, 50, 40);
        bmul.setBounds(190, 140, 50, 40);

        b1.setBounds(40, 180, 50, 40);
        b2.setBounds(90, 180, 50, 40);
        b3.setBounds(140, 180, 50, 40);
        bsub.setBounds(190, 180, 50, 40);

        b0.setBounds(40, 220, 50, 40);
        bdec.setBounds(90, 220, 50, 40);
        badd.setBounds(140, 220, 50, 40);
```

```
        beq.setBounds(190, 220, 50, 40);

        bdel.setBounds(40, 260, 100, 40);
        bclr.setBounds(140, 260, 100, 40);

        b1.addActionListener(this);
        b2.addActionListener(this);
        b3.addActionListener(this);
        b4.addActionListener(this);
        b5.addActionListener(this);
        b6.addActionListener(this);
        b7.addActionListener(this);
        b8.addActionListener(this);
        b9.addActionListener(this);
        b0.addActionListener(this);
        badd.addActionListener(this);
        bsub.addActionListener(this);
        bmul.addActionListener(this);
        bdiv.addActionListener(this);
        bdec.addActionListener(this);
        beq.addActionListener(this);
        bdel.addActionListener(this);
        bclr.addActionListener(this);

        f.add(t);
        f.add(b1);
        f.add(b2);
        f.add(b3);
        f.add(b4);
        f.add(b5);
        f.add(b6);
        f.add(b7);
        f.add(b8);
        f.add(b9);
        f.add(b0);
        f.add(badd);
        f.add(bsub);
        f.add(bmul);
        f.add(bdiv);
        f.add(bdec);
        f.add(beq);
        f.add(bdel);
        f.add(bclr);
    }

    public static void main(String[] args) {
        new MyCalculator();
    }

    @Override
    public void actionPerformed(ActionEvent e) {
        if (e.getSource() == b1) {
            t.setText(t.getText().concat("1"));
        }
        if (e.getSource() == b2) {
            t.setText(t.getText().concat("2"));
        }
        if (e.getSource() == b3) {
```

```
            t.setText(t.getText().concat("3"));
        }
        if (e.getSource() == b4) {
            t.setText(t.getText().concat("4"));
        }
        if (e.getSource() == b5) {
            t.setText(t.getText().concat("5"));
        }
        if (e.getSource() == b6) {
            t.setText(t.getText().concat("6"));
        }
        if (e.getSource() == b7) {
            t.setText(t.getText().concat("7"));
        }
        if (e.getSource() == b8) {
            t.setText(t.getText().concat("8"));
        }
        if (e.getSource() == b9) {
            t.setText(t.getText().concat("9"));
        }
        if (e.getSource() == b0) {
            t.setText(t.getText().concat("0"));
        }
        if (e.getSource() == bdec) {
            String curr = t.getText();

            String[] nums = curr.split("[-+*/]");

            if (nums[nums.length - 1].indexOf('.') == -1) {
                t.setText(t.getText().concat("."));
            }
        }
        if (e.getSource() == bclr) {
            t.setText("");
        }
        if (e.getSource() == bdel) {
            String str = t.getText();
            t.setText(" ");
            for (int i = 0; i < str.length() - 1; i++) {
                t.setText((t.getText() + str.charAt(i)));
            }
        }
        if (e.getSource() == badd) {
            if (t.getText().length() == 0)
                return;

            if (!checkForOpeators(t.getText()))
                t.setText(t.getText().concat("+"));
        }
        if (e.getSource() == bsub) {
            if (t.getText().length() == 0)
                return;

            if (!checkForOpeators(t.getText()))
                t.setText(t.getText().concat("-"));
        }
        if (e.getSource() == bmul) {
            if (t.getText().length() == 0)
```

```
                return;
            if (!checkForOpeators(t.getText()))
                t.setText(t.getText().concat("*"));
        }
        if (e.getSource() == bdiv) {
            if (t.getText().length() == 0)
                return;
            if (!checkForOpeators(t.getText()))
                t.setText(t.getText().concat("/"));
        }
        if (e.getSource() == beq) {
            String curr = t.getText();

            String[] nums = curr.split("[-+*/]");
            operator = curr.replaceAll("[^-+*/]", "");

            if (nums.length > 0) {
                a = Double.parseDouble(nums[0]);
            }
            if (nums.length > 1) {
                b = Double.parseDouble(nums[1]);
            }

            calculateResult();
            t.setText(String.valueOf(result));

        }
    }

}
```

Output :