```java
package arraylistdemo3;
import java.util.ArrayList;
public class ArrayListDemo3 {
    public static void main(String[] args) {
        ArrayList al = new ArrayList();
        al.add(10);
        al.add("ratan");
        al.add("anu");
        al.add('a');
        al.add(10);
        al.add(null);
        System.out.println("ArrayList data=" + al);
        System.out.println("ArrayList size-->" + al.size());
        al.add(1, "A1"); //add the object at first index
        System.out.println("after adding objects ArrayList size-->" + al.size());
        System.out.println("ArrayList Data=" + al);
        al.remove(1); //remove the object index base
        al.remove("A"); //remove the object on object base
        System.out.println("after removeing elemetns arrayList size " + al.size());
        System.out.println("ArrayList data=" + al);
        System.out.println(al.isEmpty());
        al.clear();
        System.out.println(al.isEmpty());
    }

}
```
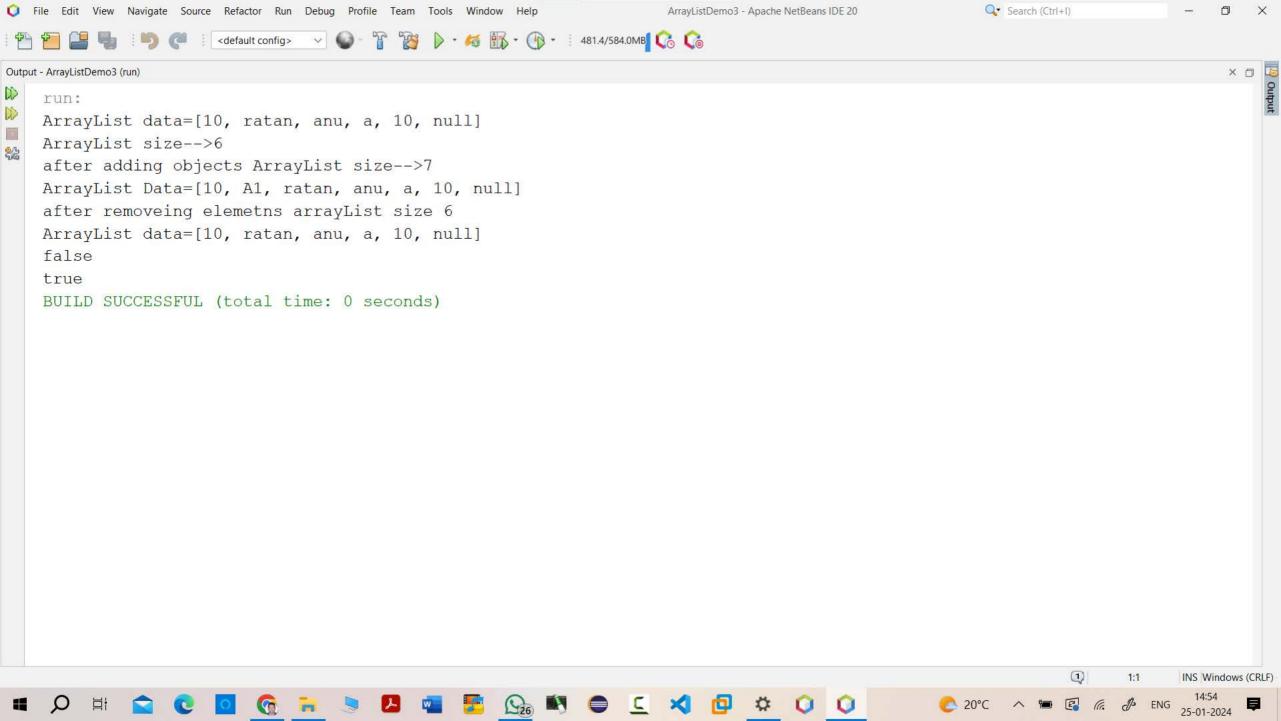
```
run:
ArrayList data=[10, ratan, anu, a, 10, null]
ArrayList size-->6
after adding objects ArrayList size-->7
ArrayList Data=[10, A1, ratan, anu, a, 10, null]
after removeing elemetns arrayList size 6
ArrayList data=[10, ratan, anu, a, 10, null]
false
true
BUILD SUCCESSFUL (total time: 0 seconds)
```
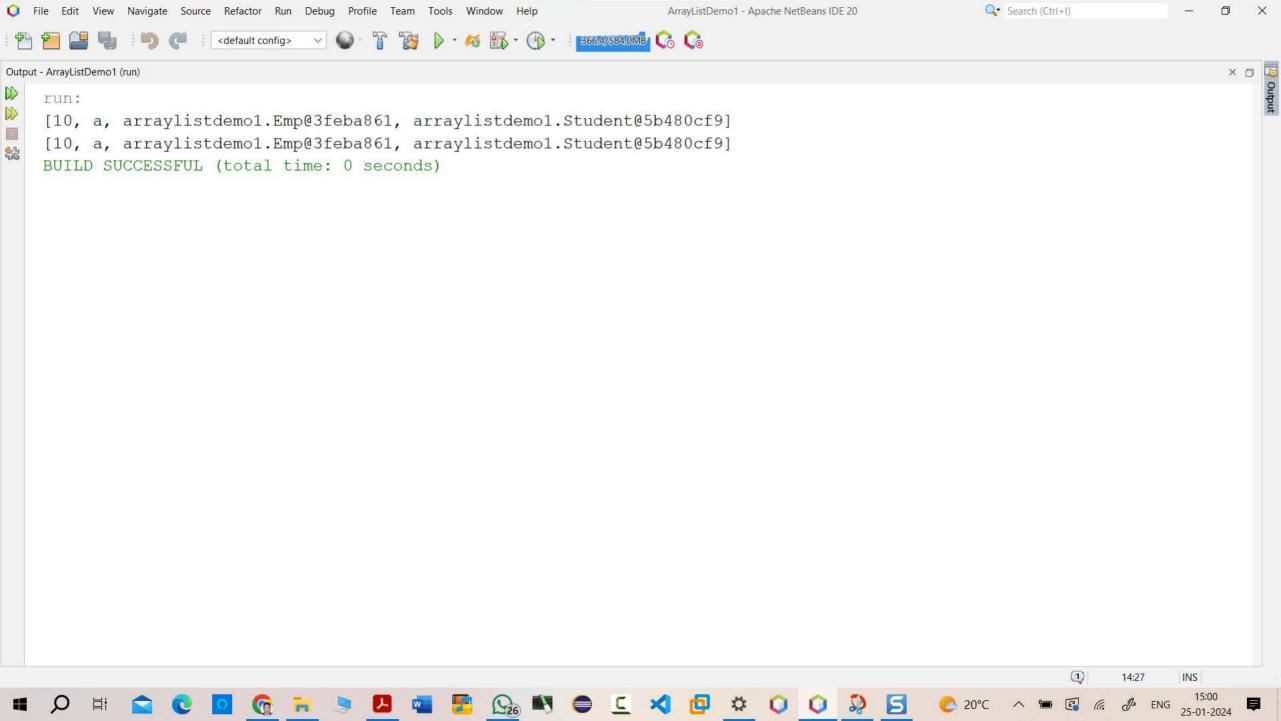
```java
/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this license
 * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this template
 */
package arraylistdemo1;

/**
 *
 * @author LENOVO
 */
public class Emp {

    int eid;
    String ename;

    Emp(int eid, String ename) {
        this.eid = eid;
        this.ename = ename;
    }

}
```

```java
/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this license
 * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this template
 */
package arraylistdemo1;

/**
 *
 * @author LENOVO
 */
public class Student {

    int sid;
    String sname;

    Student(int sid, String sname) {
        this.sid = sid;
        this.sname = sname;
    }

}
```
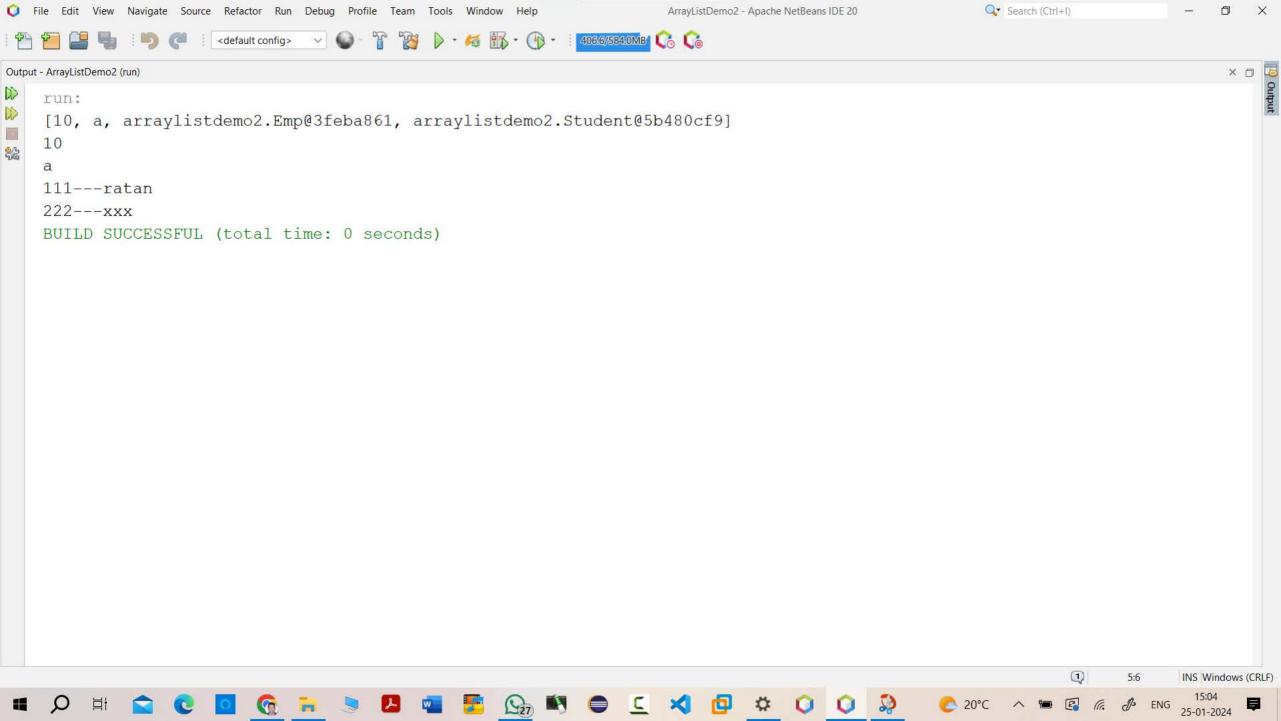
```java
/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this license
 * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Main.java to edit this template
 */
package arraylistdemo1;

/**
 *
 * @author LENOVO
 */
import java.util.ArrayList;

public class ArrayListDemo1 {

    /**
     * @param args the command line arguments
     */
    public static void main(String[] args) {
        Emp e1 = new Emp(111, "ratan");
        Student s1 = new Student(222, "xxx");
        ArrayList al = new ArrayList();
        al.add(10); //toString()
        al.add('a'); //toString()
        al.add(e1); //toString()
        al.add(s1); //toString()
        System.out.println(al); //[10, a, Emp@d70d7a, Student@b5f53a]
        System.out.println(al.toString()); //[10, a, Emp@d70d7a, Student@b5f53a]

    }

}
```

```
run:
[10, a, arraylistdemo1.Emp@3feba861, arraylistdemo1.Student@5b480cf9]
[10, a, arraylistdemo1.Emp@3feba861, arraylistdemo1.Student@5b480cf9]
BUILD SUCCESSFUL (total time: 0 seconds)
```

```java
package arraylistdemo2;
import java.util.ArrayList;
public class ArrayListDemo2 {
    public static void main(String[] args) {
        Emp e1 = new Emp(111, "ratan");
        Student s1 = new Student(222, "xxx");
        ArrayList al = new ArrayList();
        al.add(10);
        al.add('a');
        al.add(e1);
        al.add(s1);
        System.out.println(al.toString());//[10, a, Emp@d70d7a, Student@b5f53a]
        for (Object o : al) {
            if (o instanceof Integer) {
                System.out.println(o.toString());
            }
            if (o instanceof Character) {
                System.out.println(o.toString());
            }
            if (o instanceof Emp e) {
                System.out.println(e1.eid + "---" + e.ename);
            }
            if (o instanceof Student s){
                System.out.println(s1.sid + "---" + s.sname);
            }
        }

    }
}
```

```java
package arraylistdemo2;
import java.util.ArrayList;
public class ArrayListDemo2 {
    public static void main(String[] args) {
```

```
run:
[10, a, arraylistdemo2.Emp@3feba861, arraylistdemo2.Student@5b480cf9]
10
a
111---ratan
222---xxx
BUILD SUCCESSFUL (total time: 0 seconds)
```

```java
package genericarrayalistdemo;

import java.util.ArrayList;
public class GenericArrayaListDemo {
    public static void main(String[] args) {
        ArrayList<String> strings = new ArrayList<>();
        strings.add("?");
        strings.add("red");
        strings.add("bird");
        strings.add("blue");
        System.out.println(strings);
        ArrayList<Integer> ints = new ArrayList<>();
        ints.add(2);
        ints.add(3);
        ints.add(7);
        System.out.println(ints);
    }

}
```

```java
package arraylistdemo6;

import java.util.ArrayList;
public class ArrayListDemo6 {

    /**
     * @param args the command line arguments
     */
    public static void main(String[] args) {
        ArrayList al = new ArrayList();
        al.add("ratan");
        al.add("anu");
        al.add(10); //allowed
        String s1 = (String) al.get(0);
        String s2 = (String) al.get(1);
        String s3 = (String) al.get(2);//java.lang.ClassCastException
    }

}
```

```java
package genericarrayalistdemo;

import java.util.ArrayList;
public class GenericArrayaListDemo {
    public static void main(String[] args) {
        ArrayList<String> strings = new ArrayList<>();
        strings.add("?");
        strings.add("red");
        strings.add("bird");
        strings.add("blue");
        System.out.println(strings);
        ArrayList<Integer> ints = new ArrayList<>();
        ints.add(2);
        ints.add(3);
        ints.add(7);
        System.out.println(ints);
    }

}
```

```java
package arraylistdemo4;
import java.util.ArrayList;
public class ArrayListDemo4 {
    public static void main(String[] args) {

        ArrayList<Emp> al = new ArrayList<>();
        al.add(new Emp(111, "ratan"));
        al.add(new Emp(222, "anu"));
        al.add(new Emp(333, "Sravya"));
        for (Emp e : al) {
            System.out.println(e.eid + "---" + e.ename);
        }
        ArrayList<Student> al2 = new ArrayList<>();
        al2.add(new Student(111, "chirajeevi"));
        al2.add(new Student(222, "balayya"));
        al2.add(new Student(333, "nagarjuna"));
        al2.add(new Student(333, "venki"));
        for (Student s : al2) {
            System.out.println(s.sid + "---" + s.sname);
        }
    }

}
```

```java
package arraylistcontains;
import java.util.ArrayList;
public class ArrayListContains {
    public static void main(String[] args) {
        Emp e1 = new Emp(111, "ratan");
        Emp e2 = new Emp(222, "Sravya");
        Emp e3 = new Emp(333, "aruna");
        Emp e4 = new Emp(444, "anu");
        ArrayList<Emp> a1 = new ArrayList<>();
        a1.add(e1);
        a1.add(e2);
        ArrayList<Emp> a2 = new ArrayList<>();
        a2.addAll(a1);
        a2.add(e3);
        a2.add(e4);
        System.out.println(a2.contains(e1));
        System.out.println(a2.containsAll(a1));
        a2.remove(e1);
        System.out.println(a2.contains(e1));
        System.out.println(a2.containsAll(a1));
//printing the data
        for (Emp e : a2) {
            System.out.println(e.eid + "---" + e.ename);
        }
    }

}
```

```java
package arraylistreain;
import java.util.ArrayList;
public class ArrayListReain {
    public static void main(String[] args) {
        ArrayList<Emp> a1 = new ArrayList<>();
        a1.add(new Emp(111, "ratan"));
        a1.add(new Emp(222, "Sravya"));
        ArrayList<Emp> a2 = new ArrayList<>();
        a2.addAll(a1);
        a2.add(new Emp(333, "aruna"));
        a2.add(new Emp(444, "anu"));
        //a2.removeAll(a1);
        a2.retainAll(a1);
        for (Emp e : a2) {
            System.out.println(e.eid + "---" + e.ename);
        }

    }

}
```