

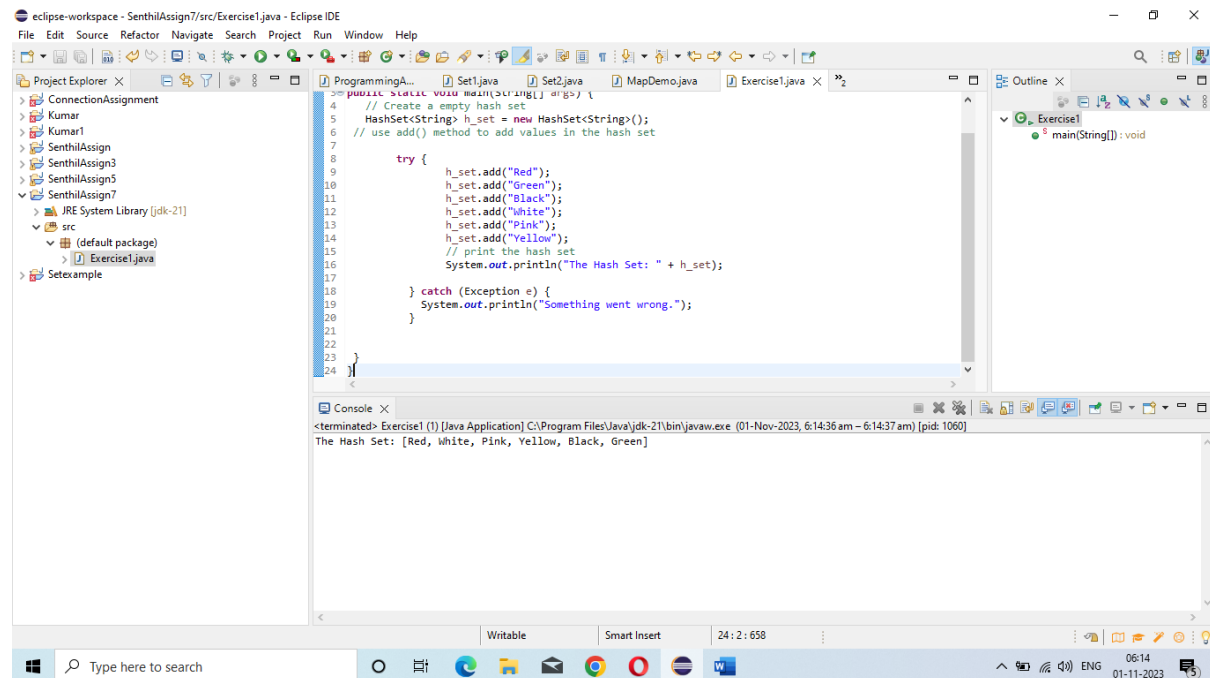
## Assignment 7 Collections in Java-Solutions

1. Write a Java program to append the specified element to the end of a hash set.

**Hint: Try using Integer instead of String along with Try.. Catch method**

Codeshare link:

<https://codeshare.io/YLvry3>



The screenshot shows the Eclipse IDE with a project named 'SenthilAssign7'. The 'src' folder contains 'Exercise1.java'. The code in 'Exercise1.java' is as follows:

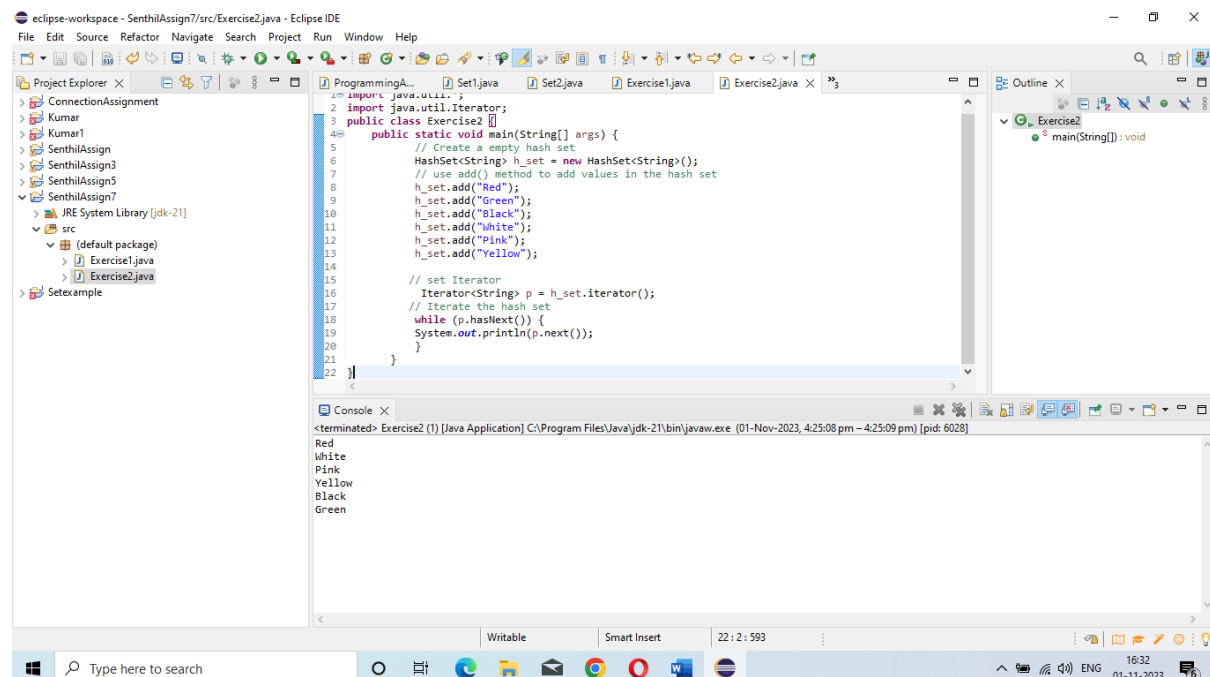
```
1 public class Exercise1 {
2     public static void main(String[] args) {
3         // Create a empty hash set
4         HashSet<String> h_set = new HashSet<String>();
5         // use add() method to add values in the hash set
6
7         try {
8             h_set.add("Red");
9             h_set.add("Green");
10            h_set.add("Black");
11            h_set.add("White");
12            h_set.add("Pink");
13            h_set.add("Yellow");
14            // print the hash set
15            System.out.println("The Hash Set: " + h_set);
16
17        } catch (Exception e) {
18            System.out.println("Something went wrong.");
19        }
20    }
21 }
22
23
24 }
```

The console output shows: "The Hash Set: [Red, White, Pink, Yellow, Black, Green]".

2. Write a Java program to iterate through all elements in a hash list.

Codeshare link:

<https://codeshare.io/1YwXxX>



The screenshot shows the Eclipse IDE with a project named 'SenthilAssign7'. The 'src' folder contains 'Exercise2.java'. The code in 'Exercise2.java' is as follows:

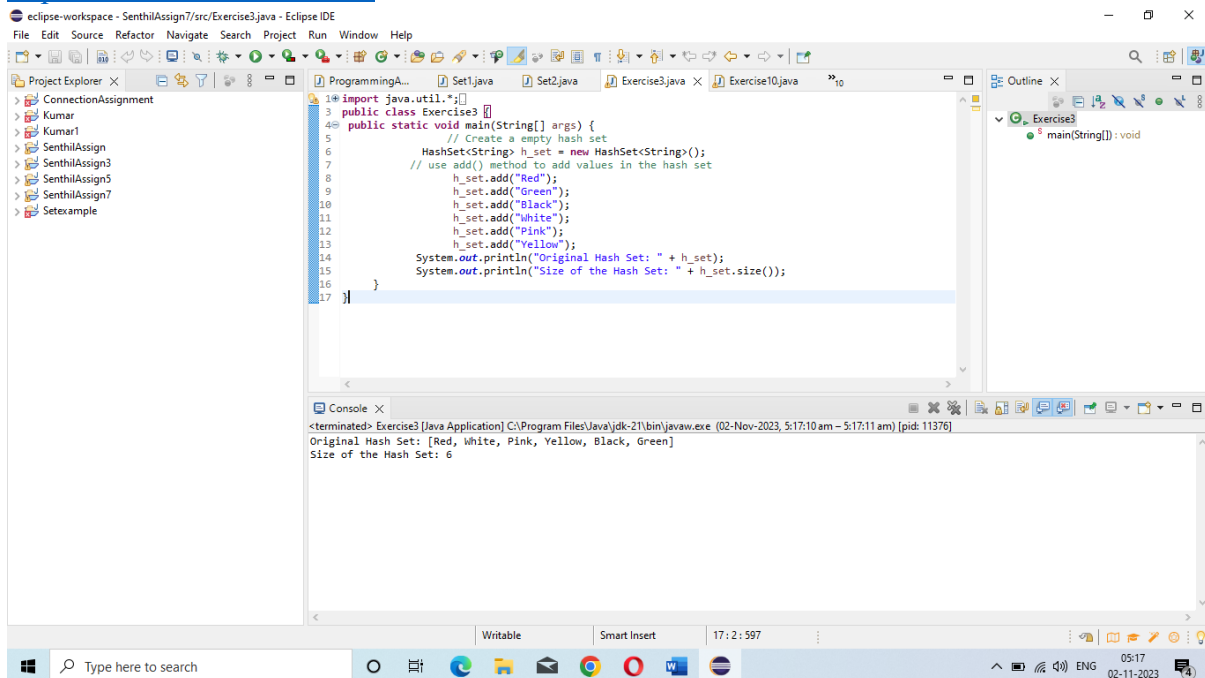
```
1 import java.util.*;
2 import java.util.Iterator;
3 public class Exercise2 {
4     public static void main(String[] args) {
5         // Create a empty hash set
6         HashSet<String> h_set = new HashSet<String>();
7         // use add() method to add values in the hash set
8         h_set.add("Red");
9         h_set.add("Green");
10        h_set.add("Black");
11        h_set.add("White");
12        h_set.add("Pink");
13        h_set.add("Yellow");
14
15        // set Iterator
16        Iterator<String> p = h_set.iterator();
17        // Iterate the hash set
18        while (p.hasNext()) {
19            System.out.println(p.next());
20        }
21    }
22 }
```

The console output shows: "Red", "White", "Pink", "Yellow", "Black", "Green".

3. Write a Java program to get the number of elements in a hash set.

Codeshare link:

<https://codeshare.io/DZ0z4E>



The screenshot shows the Eclipse IDE with a project named 'SenthilAssign7'. The 'Exercise3.java' file is open, containing the following code:

```
1 import java.util.*;
2
3 public class Exercise3 {
4     // Create a empty hash set
5     public static void main(String[] args) {
6         HashSet<String> h_set = new HashSet<String>();
7         // use add() method to add values in the hash set
8         h_set.add("Red");
9         h_set.add("Green");
10        h_set.add("Black");
11        h_set.add("White");
12        h_set.add("Pink");
13        h_set.add("Yellow");
14        System.out.println("Original Hash Set: " + h_set);
15        System.out.println("Size of the Hash Set: " + h_set.size());
16    }
17 }
```

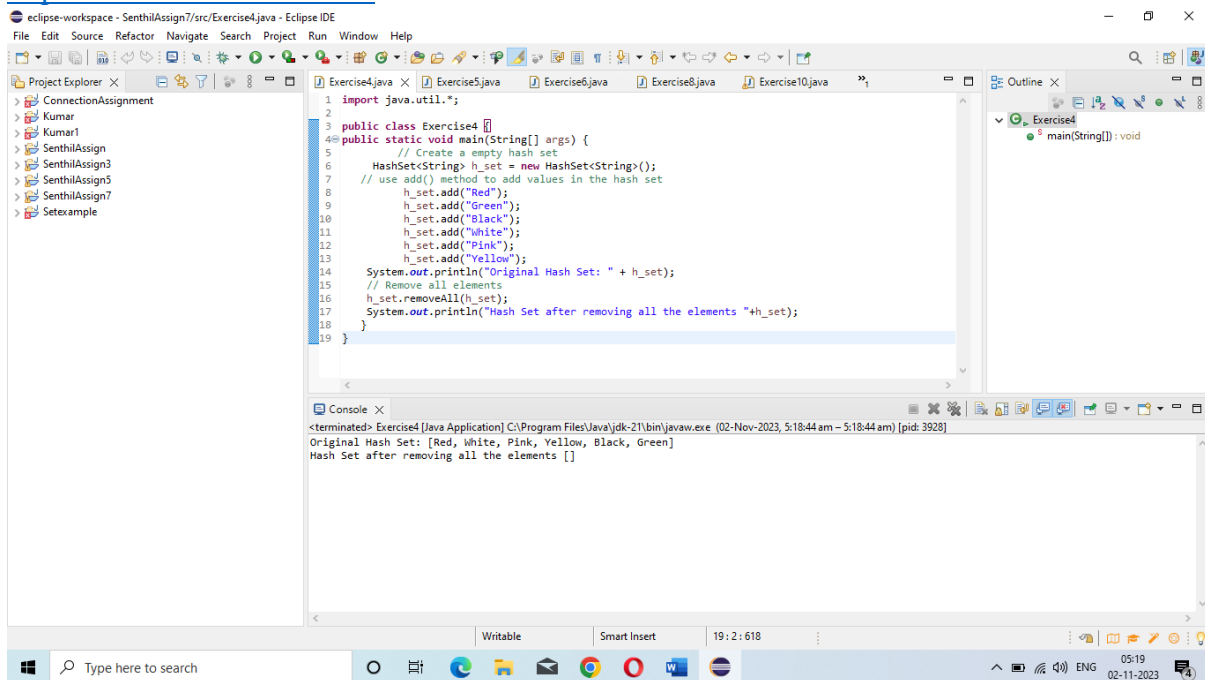
The console output shows:

```
<terminated> Exercise3 [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe (02-Nov-2023, 5:17:10 am - 5:17:11 am) [pid: 11376]
Original Hash Set: [Red, White, Pink, Yellow, Black, Green]
Size of the Hash Set: 6
```

4. Write a Java program to empty an hash set.

Codeshare link:

<https://codeshare.io/PdW3J7>



The screenshot shows the Eclipse IDE with a project named 'SenthilAssign7'. The 'Exercise4.java' file is open, containing the following code:

```
1 import java.util.*;
2
3 public class Exercise4 {
4     // Create a empty hash set
5     public static void main(String[] args) {
6         HashSet<String> h_set = new HashSet<String>();
7         // use add() method to add values in the hash set
8         h_set.add("Red");
9         h_set.add("Green");
10        h_set.add("Black");
11        h_set.add("White");
12        h_set.add("Pink");
13        h_set.add("Yellow");
14        System.out.println("Original Hash Set: " + h_set);
15        // Remove all elements
16        h_set.removeAll(h_set);
17        System.out.println("Hash Set after removing all the elements "+h_set);
18    }
19 }
```

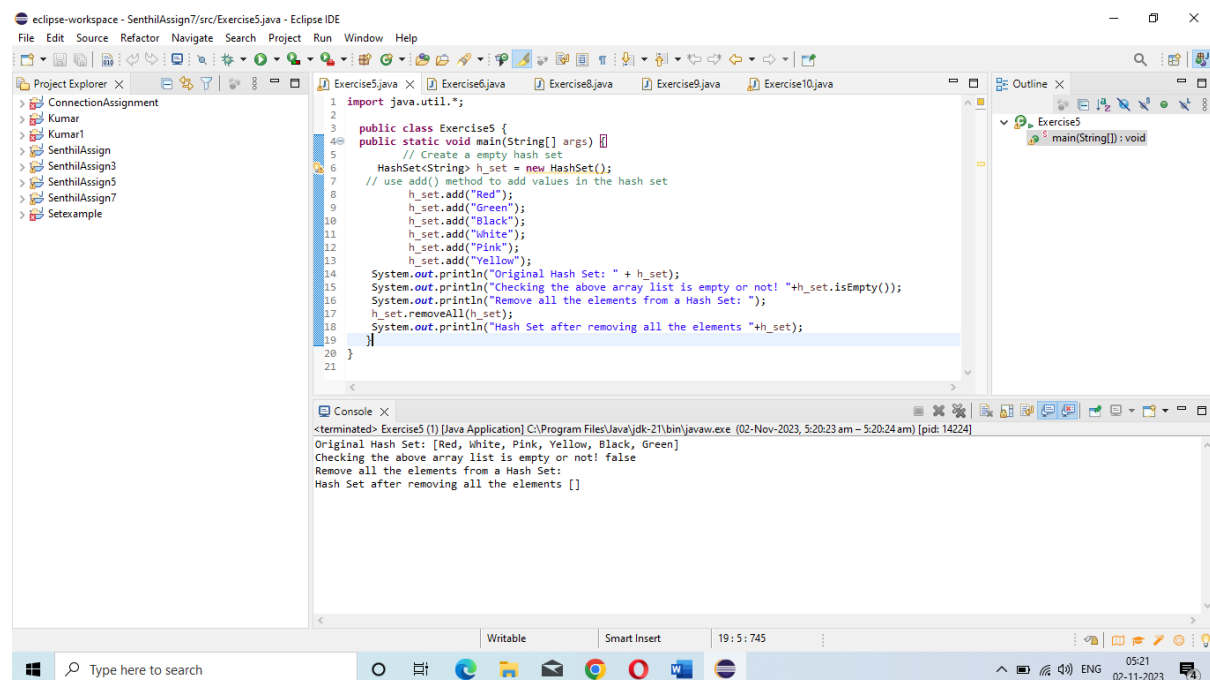
The console output shows:

```
<terminated> Exercise4 [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe (02-Nov-2023, 5:18:44 am - 5:18:44 am) [pid: 3928]
Original Hash Set: [Red, White, Pink, Yellow, Black, Green]
Hash Set after removing all the elements []
```

5. Write a Java program to test a hash set is empty or not

Codeshare link:

<https://codeshare.io/qPgYWB>



The screenshot shows the Eclipse IDE with a Java project named 'SenthilAssign7'. The 'Project Explorer' on the left shows the project structure. The 'Main Editor' displays the code for 'Exercise5.java'. The code creates a 'HashSet' and adds several elements. It then prints the original hash set, checks if it is empty, removes all elements, and prints the hash set after removal.

```
1 import java.util.*;
2
3 public class Exercise5 {
4     public static void main(String[] args) {
5         // Create a empty hash set
6         HashSet<String> h_set = new HashSet();
7         // use add() method to add values in the hash set
8         h_set.add("Red");
9         h_set.add("Green");
10        h_set.add("Black");
11        h_set.add("White");
12        h_set.add("Pink");
13        h_set.add("Yellow");
14        System.out.println("Original Hash Set: " + h_set);
15        System.out.println("Checking the above array list is empty or not! " + h_set.isEmpty());
16        System.out.println("Remove all the elements from a Hash Set: ");
17        h_set.removeAll(h_set);
18        System.out.println("Hash Set after removing all the elements " + h_set);
19    }
20 }
21
```

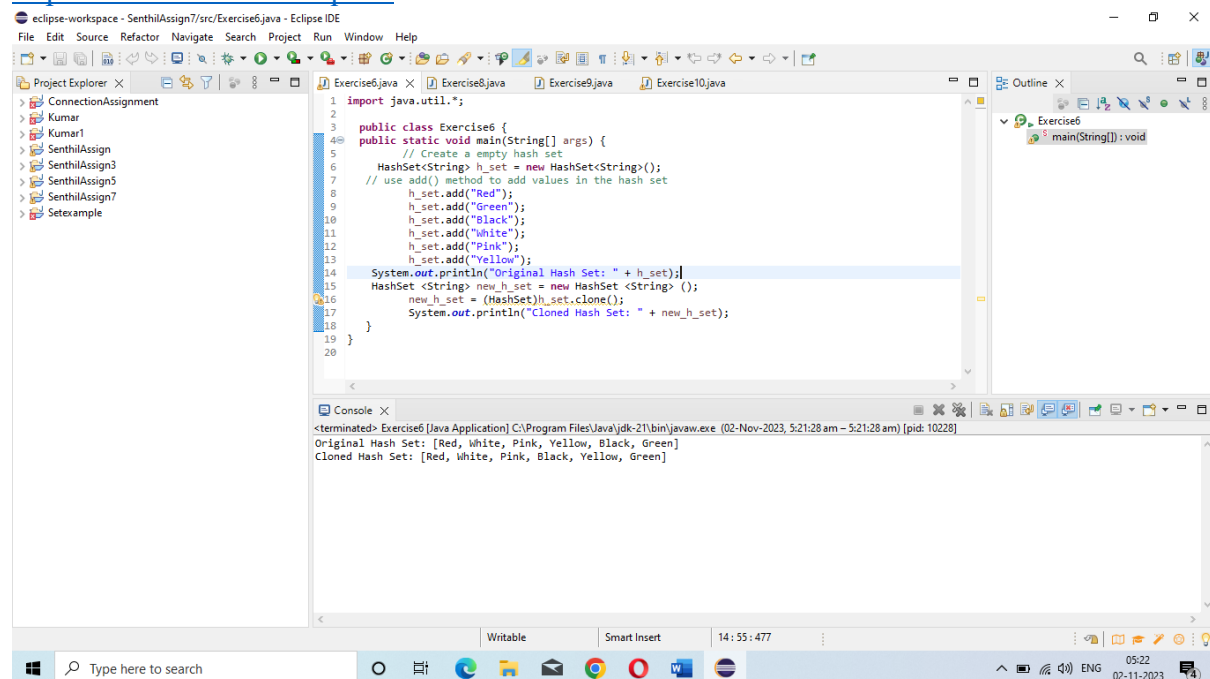
The 'Console' at the bottom shows the output of the program:

```
<terminated> Exercise5 (1) [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe (02-Nov-2023, 5:20:23 am - 5:20:24 am) [pid: 14224]
Original Hash Set: [Red, white, Pink, Yellow, Black, Green]
Checking the above array list is empty or not! false
Remove all the elements from a Hash Set:
Hash Set after removing all the elements []
```

6. Write a Java program to clone a hash set to another hash set.

Codeshare link:

<https://codeshare.io/MNqn4O>



The screenshot shows the Eclipse IDE with a Java project named 'SenthilAssign7'. The 'Project Explorer' on the left shows the project structure. The 'Main Editor' displays the code for 'Exercise6.java'. The code creates a 'HashSet' and adds several elements. It then creates a new 'HashSet' and clones the original hash set into it. Finally, it prints both the original and the cloned hash sets.

```
1 import java.util.*;
2
3 public class Exercise6 {
4     public static void main(String[] args) {
5         // Create a empty hash set
6         HashSet<String> h_set = new HashSet<String>();
7         // use add() method to add values in the hash set
8         h_set.add("Red");
9         h_set.add("Green");
10        h_set.add("Black");
11        h_set.add("White");
12        h_set.add("Pink");
13        h_set.add("Yellow");
14        System.out.println("Original Hash Set: " + h_set);
15        HashSet<String> new_h_set = new HashSet<String> ();
16        new_h_set = (HashSet)h_set.clone();
17        System.out.println("Cloned Hash Set: " + new_h_set);
18    }
19 }
20
```

The 'Console' at the bottom shows the output of the program:

```
<terminated> Exercise6 [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe (02-Nov-2023, 5:21:28 am - 5:21:28 am) [pid: 10228]
Original Hash Set: [Red, white, Pink, Yellow, Black, Green]
Cloned Hash Set: [Red, white, Pink, Black, Yellow, Green]
```

7. Write a Java program to convert a hash set to an array.

Codeshare link:

<https://codeshare.io/QnxqJm>

The screenshot shows the Eclipse IDE with a project named 'SenthilAssign7'. The 'Project Explorer' on the left shows a package 'src' containing several Java files, including 'Exercise7.java'. The 'Main' tab displays the code for 'Exercise7.java', which creates a HashSet, adds elements, and converts it to an array. The 'Console' at the bottom shows the output of the program.

```
1 import java.util.*;
2 public class Exercise7 {
3     public static void main(String[] args) {
4         // Create a empty hash set
5         HashSet<String> h_set = new HashSet<String>();
6         // use add() method to add values in the hash set
7         h_set.add("Red");
8         h_set.add("Green");
9         h_set.add("Black");
10        h_set.add("White");
11        h_set.add("Pink");
12        h_set.add("Yellow");
13        System.out.println("Original Hash Set: " + h_set);
14        // Creating an Array
15        String[] new_array = new String[h_set.size()];
16        h_set.toArray(new_array);
17
18        // Displaying Array elements
19        System.out.println("Array elements: ");
20        for(String element : new_array){
21            System.out.println(element);
22        }
23    }
24 }
```

Console Output:

```
<terminated> Exercise7 [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe (02-Nov-2023, 5:27:10 am - 5:27:10 am) [pid: 9684]
Original Hash Set: [Red, white, Pink, Yellow, Black, Green]
Array elements:
Red
White
Pink
Yellow
Black
Green
```

8. Write a Java program to convert a hash set to a tree set.

Codeshare link:

<https://codeshare.io/BANX4m>

The screenshot shows the Eclipse IDE with a project named 'SenthilAssign7'. The 'Project Explorer' on the left shows a package 'src' containing several Java files, including 'Exercise8.java'. The 'Main' tab displays the code for 'Exercise8.java', which creates a HashSet, adds elements, and converts it to a TreeSet. The 'Console' at the bottom shows the output of the program.

```
4
5 HashSet<String> h_set = new HashSet<String>();
6 // use add() method to add values in the hash set
7 h_set.add("Red");
8 h_set.add("Green");
9 h_set.add("Black");
10 h_set.add("White");
11 h_set.add("Pink");
12 h_set.add("Yellow");
13 System.out.println("Original Hash Set: " + h_set);
14
15 // Create a TreeSet of HashSet elements
16 Set<String> tree_set = new TreeSet<String>(h_set);
17
18 // Display TreeSet elements
19 System.out.println("TreeSet elements: ");
20 for(String element : tree_set){
21     System.out.println(element);
22 }
23
24 }
25 }
```

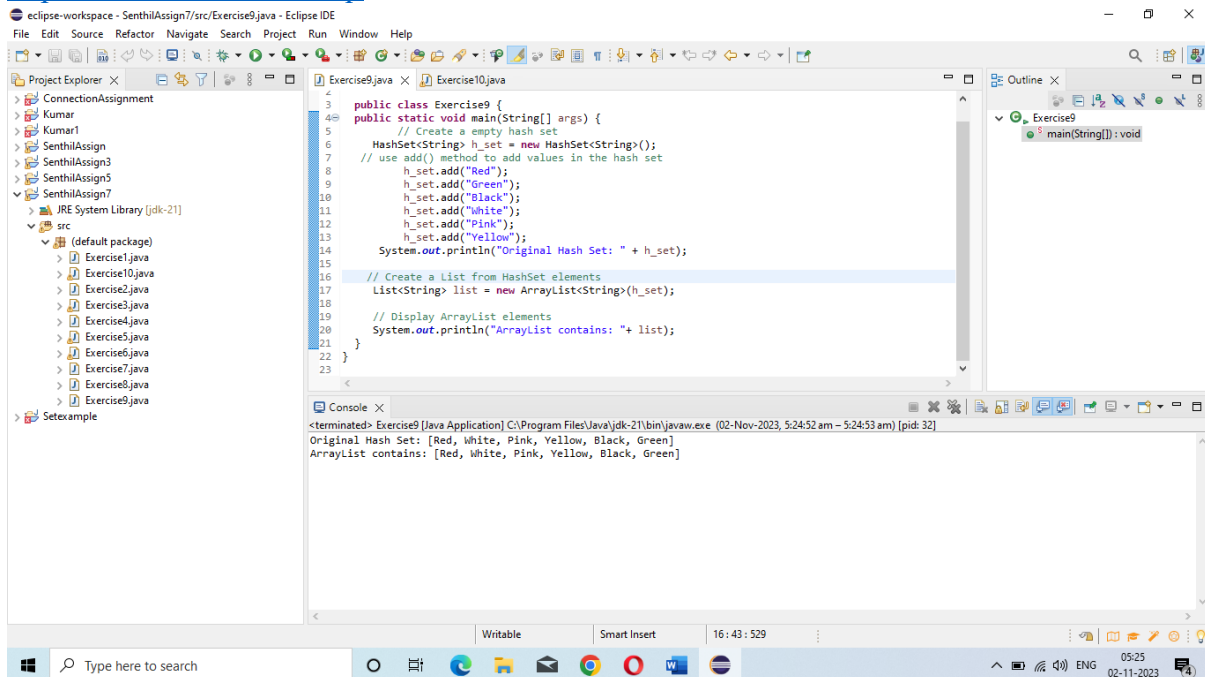
Console Output:

```
<terminated> Exercise8 [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe (02-Nov-2023, 5:23:44 am - 5:23:45 am) [pid: 6560]
Original Hash Set: [Red, white, Pink, Yellow, Black, Green]
TreeSet elements:
Black
Green
Pink
Red
White
Yellow
```

9. Write a Java program to convert a hash set to a List/ArrayList.

Codeshare link:

<https://codeshare.io/JbZKqr>



The screenshot shows the Eclipse IDE with a project named 'SenthilAssign7'. The 'src' folder contains several Java files, including 'Exercise9.java'. The code in 'Exercise9.java' is as follows:

```
public class Exercise9 {  
    public static void main(String[] args) {  
        // Create a empty hash set  
        HashSet<String> h_set = new HashSet<String>();  
        // use add() method to add values in the hash set  
        h_set.add("Red");  
        h_set.add("Green");  
        h_set.add("Black");  
        h_set.add("White");  
        h_set.add("Pink");  
        h_set.add("Yellow");  
        System.out.println("Original Hash Set: " + h_set);  
  
        // Create a List from HashSet elements  
        List<String> list = new ArrayList<String>(h_set);  
  
        // Display ArrayList elements  
        System.out.println("ArrayList contains: " + list);  
    }  
}
```

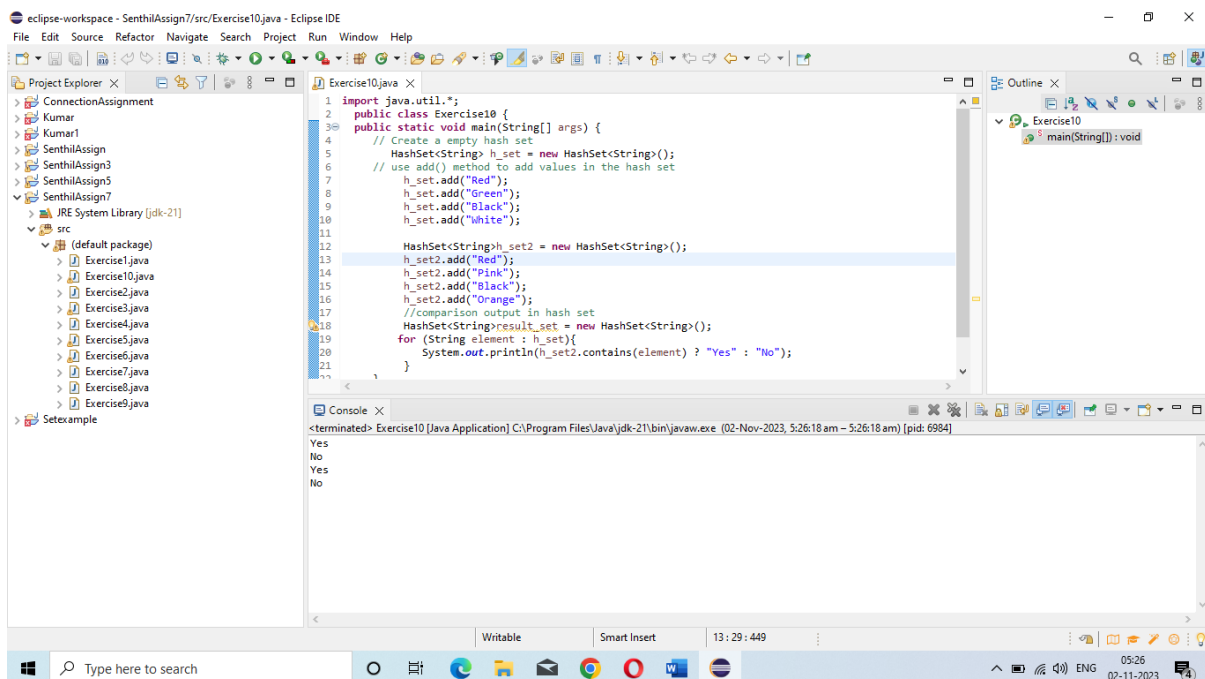
The console output shows the execution of the program:

```
<terminated> Exercise9 [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe (02-Nov-2023, 5:24:52 am - 5:24:53 am) [pid: 32]  
Original Hash Set: [Red, White, Pink, Yellow, Black, Green]  
ArrayList contains: [Red, White, Pink, Yellow, Black, Green]
```

10. Write a Java program to compare two hash set.

Codeshare link:

<https://codeshare.io/zyRYVE>



The screenshot shows the Eclipse IDE with a project named 'SenthilAssign7'. The 'src' folder contains several Java files, including 'Exercise10.java'. The code in 'Exercise10.java' is as follows:

```
import java.util.*;  
public class Exercise10 {  
    public static void main(String[] args) {  
        // Create a empty hash set  
        HashSet<String> h_set = new HashSet<String>();  
        // use add() method to add values in the hash set  
        h_set.add("Red");  
        h_set.add("Green");  
        h_set.add("Black");  
        h_set.add("White");  
  
        HashSet<String> h_set2 = new HashSet<String>();  
        h_set2.add("Red");  
        h_set2.add("Pink");  
        h_set2.add("Black");  
        h_set2.add("Orange");  
  
        // comparison output in hash set  
        HashSet<String> result_set = new HashSet<String>();  
        for (String element : h_set) {  
            System.out.println(h_set2.contains(element) ? "Yes" : "No");  
        }  
    }  
}
```

The console output shows the execution of the program:

```
<terminated> Exercise10 [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe (02-Nov-2023, 5:26:18 am - 5:26:18 am) [pid: 6984]  
Yes  
No  
Yes  
No
```

