PROGRAM 1:

```
import java.util.HashMap;
import java.util.Scanner;
public class PhoneDirectory {
   public static void main(String[] args) {
      HashMap<String, String> phoneDirectory = new HashMap<>();
      Scanner scanner = new Scanner(System.in);
      String choice;
do {
         System.out.println("1. Find phone number");
         System.out.println("2. Add new entry");
         System.out.println("3. Exit");
         System.out.print("Enter your choice: ");
         choice = scanner.nextLine();
switch (choice) {
            case "1":
               System.out.print("Enter name to find phone number: ");
               String name = scanner.nextLine();
               String phoneNumber = phoneDirectory.get(name);
               if (phoneNumber != null) {
                  System.out.println("Phone number for " + name + ": " + phoneNumber);
               } else {
                  System.out.println("No phone number found for " + name);
               }
               break;
            case "2":
               System.out.print("Enter name: ");
               String newName = scanner.nextLine();
```

```
                System.out.print("Enter phone number: ");
                String newPhoneNumber = scanner.nextLine();
                phoneDirectory.put(newName, newPhoneNumber);
                System.out.println("Entry added successfully.");
                break;
            case "3":
                System.out.println("Exiting program.");
                break;
            default:
                System.out.println("Invalid choice. Please try again.");
        }
    } while (!choice.equals("3"));
  }
}
```

PROGRAM 2:

```
import java.util.Scanner;
import java.util.TreeMap;
public class SearchKeyInTreeMap {
   public static void main(String[] args) {
      TreeMap<String, Integer> treeMap = new TreeMap<>();
      treeMap.put("Alice", 30);
      treeMap.put("Bob", 25);
      treeMap.put("Charlie", 35);
Scanner scanner = new Scanner(System.in);
      System.out.print("Enter name to search for: ");
      String name = scanner.nextLine();
 if (treeMap.containsKey(name)) {
```

```
            System.out.println(name + "'s age is: " + treeMap.get(name));
        } else {
            System.out.println("Name not found.");
        }
    }
}
```

PROGRAM 3:

```
import java.util.Map;
import java.util.Scanner;
import java.util.TreeMap;
public class SearchValueInTreeMap {
    public static void main(String[] args) {
        TreeMap<String, Integer> treeMap = new TreeMap<>();
        treeMap.put("Alice", 30);
        treeMap.put("Bob", 25);
        treeMap.put("Charlie", 35);
   Scanner scanner = new Scanner(System.in);
        System.out.print("Enter age to search for: ");
        int age = scanner.nextInt();
         boolean found = false;
        for (Map.Entry<String, Integer> entry : treeMap.entrySet()) {
            if (entry.getValue() == age) {
                System.out.println("Name with age " + age + ": " + entry.getKey());
                found = true;
            }
        }
   if (!found) {
```

```
            System.out.println("No name found with age " + age);
        }
    }
}
```