

Rajalakshmi Engineering College

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2024_28_III_OOPS Using Java Lab

REC_2028_OOPS using Java_Week 10_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 15

Section 1 : MCQ

1. Which method removes all elements from a Set?

Answer

clear()

Status : Correct

Marks : 1/1

2. Which of the following allows null keys in Java?

Answer

HashMap

Status : Correct

Marks : 1/1

3. What is the time complexity of retrieving an element from a HashSet?

Answer

O(1)

Status : Correct

Marks : 1/1

4. What happens when you add duplicate elements to a HashSet?

Answer

The duplicate is ignored

Status : Correct

Marks : 1/1

5. Which method retrieves the lowest key in a TreeMap?

Answer

firstKey()

Status : Correct

Marks : 1/1

6. What happens if two keys have the same hash code in a HashMap?

Answer

A linked list is used to store values with the same hash

Status : Correct

Marks : 1/1

7. What will be the output of the following code?

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        HashMap<String, Integer> map = new HashMap<>();
        map.put("X", 10);
        map.put("Y", 20);
        map.put("Z", 30);
```

```
        map.remove("Y");
        System.out.println(map);
    }
}
```

Answer

{X=10, Z=30}

Status : Correct

Marks : 1/1

8. What will happen if you add a null element to a TreeSet?

Answer

An exception occurs

Status : Correct

Marks : 1/1

9. What will happen if you add elements in descending order in a TreeSet?

Answer

They are sorted in ascending order

Status : Correct

Marks : 1/1

10. Which statement is true about HashSet and TreeSet?

Answer

TreeSet provides sorted elements

Status : Correct

Marks : 1/1

11. Which of the following is true about TreeMap?

Answer

It maintains natural ordering

Status : Correct

Marks : 1/1

12. Which of the following is true about HashMap?

Answer

It is not synchronized

Status : Correct

Marks : 1/1

13. How does HashSet check for duplicate elements?

Answer

Using equals() and hashCode()

Status : Correct

Marks : 1/1

14. What will be the output of the following code?

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        HashMap<String, Integer> map = new HashMap<>();
        map.put("A", 1);
        map.put("B", 2);
        map.put("C", 3);
        System.out.println(map.containsKey("B"));
    }
}
```

Answer

true

Status : Correct

Marks : 1/1

15. What will be the output of the following code?

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        HashMap<String, String> map = new HashMap<>();
```

```
        map.put("A", "Apple");
        map.put("B", "Banana");
        map.put("C", "Cherry");
        map.replace("B", "Blueberry");
        System.out.println(map);
    }
}
```

Answer

{A=Apple, B=Blueberry, C=Cherry}

Status : Correct

Marks : 1/1

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 10_Q1

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : COD

1. Problem Statement

A city traffic management system needs to track vehicles entering a toll booth. Each vehicle is uniquely identified by its registration number. The system should allow adding vehicles to a record, ensuring that no duplicate registration numbers exist. The vehicles should be stored in a HashSet, which does not guarantee any specific order.

Your task is to implement a program using a HashSet that allows adding vehicle details and displaying the records.

Input Format

The first line of input contains an integer N - the number of vehicles.

The next N lines contain details of each vehicle in the format: "RegNumber

OwnerName VehicleType"

1. RegNumber (String) - A unique registration number (Alphanumeric).
2. OwnerName (String) - The name of the vehicle owner.
3. VehicleType (String, Car, Bike, or Truck) - The type of vehicle.

If a vehicle with the same registration number is already present, ignore the duplicate entry.

Output Format

The output prints the unique vehicle records in any order (since HashSet does not maintain order).

Output format: "RegNumber OwnerName VehicleType"

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5

KA01AB1234 John Car

MH02CD5678 Alice Bike

DL03EF9012 Bob Truck

TN04GH3456 Mike Car

KA01AB1234 John Car

Output: TN04GH3456 Mike Car

KA01AB1234 John Car

MH02CD5678 Alice Bike

DL03EF9012 Bob Truck

Answer

```
// You are using Java  
import java.util.*;
```

```
class Vehicle {
```

```
    String regNumber;
```

```
    String ownerName;
```

```
    String vehicleType;
```

```
    public Vehicle(String regNumber, String ownerName, String vehicleType) {
```

```
        this.regNumber = regNumber;
        this.ownerName = ownerName;
        this.vehicleType = vehicleType;
    }

    @Override
    public int hashCode() {
        return regNumber.hashCode(); // uniqueness based on regNumber
    }

    @Override
    public boolean equals(Object obj) {
        if (this == obj) return true;
        if (!(obj instanceof Vehicle)) return false;
        Vehicle v = (Vehicle) obj;
        return this.regNumber.equals(v.regNumber);
    }

    @Override
    public String toString() {
        return regNumber + " " + ownerName + " " + vehicleType;
    }
}

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        int N = sc.nextInt();
        HashSet<Vehicle> set = new HashSet<>();

        for (int i = 0; i < N; i++) {
            String reg = sc.next();
            String owner = sc.next();
            String type = sc.next();

            set.add(new Vehicle(reg, owner, type)); // duplicates ignored because of
equals()
        }

        for (Vehicle v : set) {
            System.out.println(v);
        }
    }
}
```

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Status : Correct

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Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 10_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : COD

1. Problem Statement

John is organizing a fruit festival, and the quantities of various fruits are stored in a HashMap where fruit names are keys and quantities are values.

Help him develop a program to find the total quantity of fruits for the festival by summing up the values in the HashMap.

Input Format

The input consists of fruit quantities in the format 'fruitName:quantity', where fruitName is the name of the fruit(a string), and quantity is a double value representing the quantity.

The input is terminated by entering "done".

Output Format

The output prints a double value, representing the sum of values in the HashMap, rounded off to two decimal places.

If the value is not numeric, print "Invalid input".

If any special characters other than ':' are entered, print "Invalid format".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: Banana:15.2

Orange:56.3

Mango:47.3

done

Output: 118.80

Answer

```
import java.util.*;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        HashMap<String, Double> map = new HashMap<>();
        double total = 0.0;

        while (true) {
            String input = sc.next();

            if (input.equals("done"))
                break;

            // Check for invalid special characters except ':'
            if (!input.matches("[A-Za-z]+:[0-9.]+")) {
                // If it does not match the pattern fruit:quantity
                if (!input.contains(":")) {
                    System.out.println("Invalid format");
                    return;
                }
            }
        }
    }
}
```

```
// Format contains special characters like -, @, etc.  
if (!input.matches("[A-Za-z]+.*")) {  
    System.out.println("Invalid format");  
    return;  
}  
  
String[] parts = input.split(":");  
if (parts.length != 2) {  
    System.out.println("Invalid format");  
    return;  
}  
  
String fruit = parts[0];  
String qtyStr = parts[1];  
  
double quantity;  
  
// Validate numeric  
try {  
    quantity = Double.parseDouble(qtyStr);  
} catch (Exception e) {  
    System.out.println("Invalid input");  
    return;  
}  
  
map.put(fruit, quantity);  
  
// Sum all values  
for (double q : map.values()) {  
    total += q;  
}  
  
System.out.printf("%.2f", total);  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 10_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : COD

1. Problem Statement

John is organizing a fruit festival, and the quantities of various fruits are stored in a HashMap where fruit names are keys and quantities are values.

Help him develop a program to find the total quantity of fruits for the festival by summing up the values in the HashMap.

Input Format

The input consists of fruit quantities in the format 'fruitName:quantity', where fruitName is the name of the fruit(a string), and quantity is a double value representing the quantity.

The input is terminated by entering "done".

Output Format

The output prints a double value, representing the sum of values in the HashMap, rounded off to two decimal places.

If the value is not numeric, print "Invalid input".

If any special characters other than ':' are entered, print "Invalid format".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: Banana:15.2

Orange:56.3

Mango:47.3

done

Output: 118.80

Answer

```
import java.util.*;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        HashMap<String, Double> map = new HashMap<>();
        double total = 0.0;

        while (true) {
            String input = sc.next();

            if (input.equals("done"))
                break;

            // Check for invalid special characters except ':'
            if (!input.matches("[A-Za-z]+:[0-9.]+")) {
                // If it does not match the pattern fruit:quantity
                if (!input.contains(":")) {
                    System.out.println("Invalid format");
                    return;
                }
            }
        }
    }
}
```

```
// Format contains special characters like -, @, etc.  
if (!input.matches("[A-Za-z]+.*")) {  
    System.out.println("Invalid format");  
    return;  
}  
  
String[] parts = input.split(":");  
if (parts.length != 2) {  
    System.out.println("Invalid format");  
    return;  
}  
  
String fruit = parts[0];  
String qtyStr = parts[1];  
  
double quantity;  
  
// Validate numeric  
try {  
    quantity = Double.parseDouble(qtyStr);  
} catch (Exception e) {  
    System.out.println("Invalid input");  
    return;  
}  
  
map.put(fruit, quantity);  
  
// Sum all values  
for (double q : map.values()) {  
    total += q;  
}  
  
System.out.printf("%.2f", total);  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 10_Q4

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : COD

1. Problem Statement

In a ticket reservation system, you store the available seat numbers in a TreeSet. Users input their desired seat number, and the program checks whether the chosen seat is available.

Using a TreeSet ensures quick and efficient verification of seat availability, ensuring a smooth and organized ticket booking process.

Input Format

The first line of input contains a single integer n, representing the number of available seats.

The second line contains n space-separated integers, representing the available seat numbers.

The third line contains an integer m, representing the seat number that needs to be searched.

Output Format

The output displays "[m] is present!" if the given seat is available. Otherwise, it displays "[m] is not present!"

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 4

2 4 5 6

5

Output: 5 is present!

Answer

```
// You are using Java
import java.util.*;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        int n = sc.nextInt();
        TreeSet<Integer> seats = new TreeSet<>();

        for (int i = 0; i < n; i++) {
            seats.add(sc.nextInt());
        }

        int m = sc.nextInt();

        if (seats.contains(m)) {
            System.out.println(m + " is present!");
        } else {
            System.out.println(m + " is not present!");
        }
    }
}
```

Status : Correct

Marks : 10/10