Program 1:

```java
// import the following classest to create arrays, sort, and read input from the user
import java.util.ArrayList;
import java.util.Collections;
import java.util.Scanner;


public class SubjectList {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in); //create a scanner that will allow for input to be read
        ArrayList<String> subjects = new ArrayList<>(); //initialise an array to store input

        //ask the user to enter the 4 subjects referenced that are taught in the computer science dept
        System.out.println("Enter the subjects taught in the computer science department:");
        for (int i = 0; i < 4; i++) { //loop to collect 4 inputs
            System.out.print("Subject " + (i + 1) + ": ");
            subjects.add(scanner.nextLine());
        }

        //remove the subject 'Networking' (nothing will happen if it is not inputted )
        subjects.remove("Networking");

        //sort the array in reverse alphabetical order
        Collections.sort(subjects, Collections.reverseOrder());

        //print list
        System.out.println("Here are the remaining subjects in reverse alphabetical order:");
        for (String subject : subjects) {
            System.out.println(subject);
        }
    }
}
```

```
Enter the subjects taught in the computer science department:
Subject 1: Cryptography
Subject 2: Database
Subject 3: OS
Subject 4: Networking
Here are the remaining subjects in reverse alphabetical order:
OS
Database
Cryptography
```

Program 2:

```
//import the following classes, to use hashmaps, and to get input from user
import java.util.HashMap;
import java.util.Scanner;

public class RealMadridPlayers { //declare public class

    public static void main(String[] args) { //declare main method
        Scanner scanner = new Scanner(System.in); //create a scanner which will read input from user
        HashMap<Integer, String> players = new HashMap<>(); //initialise the hashmap

        players.put(1, "Thibaut Courtois"); //add the players and jersey numbers of (some) the real madrid
players
        players.put(4, "David Alaba");
        players.put(5, "Éder Militão");
        players.put(7, "Eden Hazard");
        players.put(9, "Karim Benzema");
        players.put(10, "Luka Modric");
        players.put(11, "Marco Asensio");
        players.put(14, "Casemiro");
        players.put(15, "Federico Valverde");
        players.put(17, "Lucas Vázquez");
        players.put(20, "Vinícius Júnior");

        System.out.print("Enter the jersey number of the player you want to find: "); //promt the user to
enter a jersey number
        int jerseyNumber = scanner.nextInt();

        if (players.containsKey(jerseyNumber)) { //check if jersey number is found in the hashmap, and print
out if either the jersey is or isnt there
            System.out.println("Player with jersey number " + jerseyNumber + ": " +
players.get(jerseyNumber));
        } else {
            System.out.println("No player found with jersey number " + jerseyNumber);
        }
    }
}
```

```
Enter the jersey number of the player you want to find: 5
Player with jersey number 5: Éder Militão
```

Program 4:

```
import java.util.Scanner; //import scanner class to get input from the user

public class StringOperations {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in); //create a scanner that will allow to take input from user
        System.out.print("Input 1 from User: ");
        String firstString = scanner.nextLine();
        System.out.print("Input 2 from User: ");
        String secondString = scanner.nextLine();

        String concatenatedString = firstString + " " + secondString; //concatenate the 2 strings together and print
to console
        System.out.println("Output 1: " + concatenatedString);

        String withoutSpaces = concatenatedString.replace(" ", "").toLowerCase(); //now to get the number of
characters in the strings we will first remove all spaces, then use length() to get no. of charactesr
        System.out.println("Output 2: " + withoutSpaces.length());

        System.out.println("Output 3: " + secondString + " " + firstString); //now it will reverse the order of the
two strings

        int[] charFrequencies = new int[256]; //create an array that will count the frequency of each character
        for (char c : withoutSpaces.toCharArray()) { //iterate over each character in the strings (exluding spaces)
            charFrequencies[c]++; //add to frequency
        }

        System.out.print("Output 4: "); //print the characters that have a frequency of exactly 2
        for (int i = 0; i < charFrequencies.length; i++) {
            if (charFrequencies[i] == 2) {
                System.out.print((char) i);
            }
        }
    }
```

```
Input 1 from User: I am a student
Input 2 from User: I study in UCC
Output 1: I am a student I study in UCC
Output 2: 22
Output 3: I study in UCC I am a student
Output 4: acdns
```