Name: Sarwan Heer

CodeHS

Unit 4 Coding Task

Comment.java

```java
/*
  Run this file if you need to see the results
  Add comments for each part of the code
  To demonstrate that you understand what each part is doing
  You can see the comments in the Main file as examples
*/

import java.util.*;


public class Comment {

    public static void main(String[] args) {

        /*
           Scanner object is declared and inialized
           to be used for the console input
        */

        Scanner input = new Scanner(System.in);

        /* The flag to be used forchecking if while loop should end*/
        boolean end = false;

        /*
           Two array lists String and Integer are declared and initialized
           to hold team names and corresponding points
        */
        ArrayList<String> teams = new ArrayList<>();
        ArrayList<Integer> points = new ArrayList<>();


        /*
          do loop is used here to allow the user to quit the program
          or to enter the team they want and the score for that team
         */
        do {

            System.out.println("Press Enter to quit");

            System.out.print("Enter team name and non negative points separated by space: ");

            /*
              try block to determine what the user's input is via a String variable
              to store the input.
            */

            try {

                String response = input.nextLine();

               /*
                  if statement is used to end the program if the user does not
                  type an answer.
               */

                if (response == null || response.isEmpty()){
                    end = true;
                    throw new NullPointerException();
                }

    /*
      String stores the data and has it kept in a format
      that when displayed will show the team name and
      the score seperated.
    */

                /*
                   data string uses an array to store the multiple team names
```

```
                  and scores from the user if the user chooses to give multple responses
                */

                String[] data = response.split(" ");

            /*
              if statement ensures that the program will inform the user
              that they have not provided all the required information
            */

                if (data.length != 2) {
                    throw new NumberFormatException();
                }

                /*
                  First value in the array should be team name so it is accessed
                  as the first value in the index
                */

                String teamName = data[0];

                /*
                   The second value in the array should be the score
                   so it is accesed as the second value in the index.
                   It is then parsed so that it can be read as an integer
                */

                int teamPoints = Integer.parseInt(data[1]);

                /*
                   if statement determines whether the value given is positive which it is
                   supposed to be. If it is negative the if statement informs the user about it.
                */

                if (teamPoints < 0){
                    throw new NumberFormatException();
                }

               /*
                  These add statements ensure that if more values are entered by the user
                  they will be added to the array.
                */

                teams.add(teamName);

                points.add(teamPoints);

//Catch block to handle the exception when the program is done
            } catch ( NullPointerException npe){

                end = true;
////Catch block to handle the exception when team information is incorrect
            } catch (NumberFormatException nfe) {

                System.out.println("incorrect team information!");

            }

        //While statement ends the loop
        } while (!end);

//Prints out the table to display the team names and scores
        System.out.println("team\tpoints");

//For loop to print out all the values in the array for team names and scores
        for (int i = 0; i < teams.size(); i++){

            System.out.println(teams.get(i) + "\t" + points.get(i));
        }

    } //End of main method

} //End of Comment class
```

Main.java

```
public class Main
{
    /* names will hold the names of students*/
    public static String[] names;
    /*
        grades will hold the grades for students
        each row will have the grades for corresponding students
    */
    public static int[][] grades;

```

```
    /*main method is used for testing our code*/
    public static void main(String[] args)
    {
        /*
           Initialize names and grades.
           Students don't have same number of grades
        */
        names = new String[] {"George", "Ishaan", "Karandeep"};
        grades = new int[][] {{55, 75, 70},{100, 80},{}};

        /* Testing getDataFor method*/

        /*
          Expected output:
          There is no such student

        */
        System.out.println(getDataFor(null));

        /*
          Expected output:
          There is no such student

        */
        System.out.println(getDataFor("Thomas"));

        /*
          Expected output:
          Name: George
          Grades: 55 75 70
          Average: 66.67 ...

        */
        System.out.println(getDataFor("George"));

        /*
          Expected output:
          Name: Ishaan
          Grades: 100 80
          Average: 90.0

        */
        System.out.println(getDataFor("Ishaan"));

        /*
          Expected output:
          There are no grades for Karandeep

        */
        System.out.println(getDataFor("Karandeep"));

        /* setting grades to null*/
        grades = null;

        /*
          Expected output:
          There are no grades for George

        */
        System.out.println(getDataFor("George"));

        /* setting names to null*/
        names = null;
        /*
          Expected output:
          There is no such student

        */
        System.out.println(getDataFor("George"));

    } //End of main method

    /*
       This method will return the index
       of a given name in the names array
    */
    public static int getIndex(String name){
        /*check if names or name are null or empty*/
        if (names == null || name == null || names.length == 0){
            /* return -1 so that user knows name not found*/
            return -1;
        }
        /* iterate through names array*/
        for (int i = 0; i < names.length; i++){
            /* if name found return the index*/
            if (name.equals(names[i])){
                return i;
            }
```

```
        } //end of for loop

        /* name not found; return -1*/
        return -1;
    }

    /*
        this method will return a formatted string
        like this:
            if student is found and has grades:
                Name: George
                Grades: 50 60 70
                Average: 60.0
            if student exists but has no grades
                There are no grades for George
            for all other cases
                There is no such student

    */
    public static String getDataFor(String name){
        /* get the index*/
        int index = getIndex(name);

        /* student not found*/
        if (index == -1) {
            return "There is no such student";
        }

        /* Get the average. This will rely on your completed code*/
        double average = getAverage(name);

        /* Student found but there are no grades*/
        if (average == -1){
            return "There are no grades for " + name;
        }

        /* declare and initialize the response to be returned*/
        String response = "Name: " + name + "\nGrades: ";

        /*
          Iterate through grades particular row belonging
          to a given student whose name is in index location
        */
        for (int col = 0; col < grades[index].length; col++){
            /* add grades separated by space*/
            response += grades[index][col] + " ";
        }

        /* Add the average to the reponse */
        response += "\nAverage: " + average;

        /* return the response*/
        return response;
    } //End of getDataFor method

    /*
        This method will find the grades
        in grades 2D array for a given student
        It will calculate the average of their marks
        It will return the average if student is found
        It will return -1 if student not found, or
        if student has no marks, or
        if grades and or names are empty or null
    */

    public static double getAverage (String name){
        // get the index of the student
        int index = getIndex(name);

        // if student not found or grades is null, return -1
        if (index == -1 || grades == null) {
            return -1;
        }

        // if the student has no grades, return -1
        if (grades[index] == null || grades[index].length == 0) {
            return -1;
        }

        // calculate the sum of grades
        double sum = 0;
        for (int grade : grades[index]) {
            sum += grade;
        }

        // calculate and return the average
        return sum / grades[index].length;
    } //End of getAverage method
```

```
187.
188. } //End of Main class
```