CS 143 GRADELIST ASSIGNMENT USING ARRAYLISTS AND FILE IO

Description : Create a Grades class(Grades.java) that will manage an ArrayList of decimal grades. Your class will be able to load in grades from a file to the ArrayList, add grades entered by the user to the ArrayList, drop the lowest grade in the ArrayList, remove all grades that equal a value entered by the user from the ArrayList, display the grades in the ArrayList, and sort the grades in the ArrayList. A Class Diagram is shown below where + indicates public and – indicates private. The GradesClient program with the main method will be provided so you can test your Grades class. The Grades class you write should provide the functionality shown in the table below:

Grades Class	**Description**
-ArrayList<Double> grades	*Instance variable*
+Grades()	*Default constructor constructs the grades ArrayList. It will have no grades in the ArrayList*
+Grades(filename:String)	*One parameter constructor constructs the grades ArrayList and adds* *grades from file into ArrayList*
+readGrades(filename: String)	*Method that uses the parameter filename to open the file and read in the grades from the file and adds the grades to the ArrayList*
+calcAverage():Double	*Method that calculates the average of all the grades in the ArrayList and returns the average*
+dropLowest():Double	*Method that finds the lowest grade in the ArrayList and removes the grade. If the lowest grade is in the ArrayList multiple times then only the first grade found is dropped.*
+addGrade(grade:Double)	*Method that adds the grade passed as a parameter to the ArrayList*
+removeAllGrades(grade:Double):boolean	*Method that removes all grades that match the parameter that is passed in to the method,returns true if grade found, false otherwise*
+printSortedGrades()	*Prints the Grades in the console window*
+getGradeList():ArrayList<Double>	*Getter or accessor method that returns the ArrayList of grades*
+setGradeList(grades: ArrayList<Double>)	*Setter or mutator method that sets the ArrayList of grades to the passed in value*
+toString():String	*Override the Object's toString to display the grades in the ArrayList like* `Grades [34.0, 23.0, 10.5, 88.0, 23.0, 23.0, 23.0, 90.5]`

Sample Data in numbers.txt :

```
34.0
23.0
10.5
88.0
23.0
23.0
23.0
90.5
```

Files Needed ::

GradesClient.java
numbers.txt

Possible Sample Output :

```
*************************************
1. Read grades from file
2. Add grade
3. Remove all grades
4. Drop lowest grade
5. Display grades
6. Sort grades
7. Calculate average
8. Exit
*************************************

Enter your numerical choice: 1
Enter a filename to read the grades from:numbers.txt
 Reading in grades from numbers.txt

*************************************
1. Read grades from file
2. Add grade
3. Remove all grades
4. Drop lowest grade
5. Display grades
6. Sort grades
7. Calculate average
8. Exit
*************************************

Enter your numerical choice: 5
Grades [34.0, 23.0, 10.5, 88.0, 23.0, 23.0, 23.0, 90.5]

*************************************
1. Read grades from file
2. Add grade
3. Remove all grades
4. Drop lowest grade
5. Display grades
6. Sort grades
7. Calculate average
8. Exit
*************************************

Enter your numerical choice: 6
[10.5, 23.0, 23.0, 23.0, 23.0, 34.0, 88.0, 90.5]

*************************************
1. Read grades from file
```

```
2. Add grade
3. Remove all grades
4. Drop lowest grade
5. Display grades
6. Sort grades
7. Calculate average
8. Exit
*************************************

Enter your numerical choice: 7
Average is 39.38
*************************************
1. Read grades from file
2. Add grade
3. Remove all grades
4. Drop lowest grade
5. Display grades
6. Sort grades
7. Calculate average
8. Exit
*************************************

Enter your numerical choice: 2
Enter a grade to add:100
Adding grade 100.0

*************************************
1. Read grades from file
2. Add grade
3. Remove all grades
4. Drop lowest grade
5. Display grades
6. Sort grades
7. Calculate average
8. Exit
*************************************

Enter your numerical choice: 3
Enter a grade to remove:23.0
Removed ALL grades = 23.0

*************************************
1. Read grades from file
2. Add grade
3. Remove all grades
4. Drop lowest grade
5. Display grades
6. Sort grades
7. Calculate average
8. Exit
*************************************

Enter your numerical choice: 4
Lowest grade dropped: 10.5

*************************************
1. Read grades from file
2. Add grade
3. Remove all grades
```

```
4. Drop lowest grade
5. Display grades
6. Sort grades
7. Calculate average
8. Exit
*************************************

Enter your numerical choice: 5
Grades [34.0, 88.0, 90.5, 100.0]

*************************************
1. Read grades from file
2. Add grade
3. Remove all grades
4. Drop lowest grade
5. Display grades
6. Sort grades
7. Calculate average
8. Exit
*************************************

Enter your numerical choice: 8
GoodBye
```