**Informatics 1: Object Oriented Programming**

**Assignment 2 - Report**

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**Basic**

This section looks at the details of the implementation, lists out the features, a specification of the program,

and some additional features that might be useful.

List of desired program features:

* The program takes 2 set of values (maximum and minimum of rainfall each month), and print the following constructed strings on the terminal:
* Horizontal Monthly Precipitation Histogram (days on y-axis)
* Horizontal Yearly Precipitation Histogram (months on y-axis)
* Vertical Monthly Precipitation Histogram (days on x-axis)
* Vertical Yearly Precipitation Histogram (months on x-axis)
* The program will process the given values in the following ways:
* Calculate/generate an int value for rainfall on a specific day. The precipitation should be within the given month’s range.
* Calculate/generate a specific int value for rainfall in a month within the given range.
* A user given float value as the multiplier of the calculated rainfall values which scales the output.
* Each constructed string should include:
* Type of the histogram (yearly/monthly)
* The month if it’s a monthly graph
* Scale of the histogram (float value)
* Histogram (months/days versus precipitation)

Program specification:

* The program uses a provided set of maximum and minimum rainfall precipitation data, and produces the following graphs:
* Horizontal Monthly Precipitation Histogram
* Horizontal Yearly Precipitation Histogram
* Vertical Monthly Precipitation Histogram
* Vertical Yearly Precipitation Histogram

If it’s monthly graph, each day is represented, if it’s yearly graph, each month is represented.

* Each produced graph should be able to scale up or down itself based on user inputs.
* The produced graph should display the following:
* Whether it’s a yearly or a monthly histogram and the month if it’s a monthly graph
* Scale of the histogram
* Histogram itself
* The amount of rainfall on a specific day and the specific amount of rainfall in a given month are not given. Generate suitable values in the program. Total amount of rainfall in a month shouldn’t be above or below the limits.

Additional requirements

* There should be some TUI features that ask for user inputs, for example which graph would the user like to print out or the scaling multiplier.
* Allow user to set the maximum and minimum rainfall as well as the year, from which whether it’s a leap year and the number of days in February can determined.

**Intermediate**

This section lists the errors and issues with the code and possible solutions or improvements to the problems.

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| --- | --- | --- |
| **Program functionality** | | |
| Requirement | Issue | Proposed solution |
| Monthly plot should display a certain amount of rain for each day in the month. | There are always only 12 days being displayed. | The error is in line 66 in PrecipitationGraph.java, where the month argument and day argument are reversed, switch their order to resolve this issue. |
| Monthly plot should display 28 days for February as given by the dataProvider.java file. | There are 29 days being displayed with the 29th day being empty. | The error is in line 38 in PrecipitationGraph.java, where 29 days are supplied instead of 28. Change the number of days to 28 to resolve this issue. |
| Each monthly precipitation should be above the minimum rainfall value. | Multiple months average rainfall precipitation value are below the minimum. | The error is in line 66 in PrecipitationGraph.java, where the month argument and day argument are reversed, switch their order to resolve this issue. |
| The precipitation for January should be displayed according to Test.java | February is displayed instead. | Both the String[] monthName in line 18 and the int[][] rainfall in line 57 in PrecipitationGraph.java are 0 indexed. By subtracting 1 from the input in monthVertical in line 228 and monthHorizontal in line 210 in the same file mentioned above can resolve this issue. |
| Each daily precipitation should be above the minimum rainfall value. | Lots of daily precipitation is below the minimum. | The error is in line 65 in dataProvider.java, the wrong function is used. Change minRainInMM to maxRainInMM to resolve this issue. |

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| --- | --- | --- | --- |
| **Code quality** | | | |
| Code affected | Issue | Proposed solution | Explanation/justification |
| Method “foo” of SomeClass | Robustness: Program crashes when ... | Test for and catch invalid input by ... | The program will no longer crash and the user receives an informative error message. |
| Line 123 in SomeClass |  |  |  |

**Note: If you want to refer to code by line number, you must use the line numbers in the provided code. These may change if you e.g. add comments to the code to help your own understanding!**

|  |  |  |  |
| --- | --- | --- | --- |
| **Code documentation** | | | |
| Code affected | Issue | Proposed solution | Explanation/justification |
| The whole of SomeClass | Code is not commented at all | At the very least, methods A, B and C need an explanation of the parameters they take. | Explaining how to call your methods properly makes it easier for others to use your code and reduces error. |
|  |  |  |  |

**Advanced**

<TODO: Very short section intro e.g. “This section does X and Y”>

Method “m1”:

Proposed method name: somethingMoreDescriptive

Description of what it does: <TODO>

Description of how it works: <TODO>

Method “m2”:

...

Question 1: What kind of data structure is this and what would be a better class name?

<TODO>

Question 2: What are the advantages and disadvantages of the chosen data representation?

<TODO>

Question 3: Is there any justification for writing code like this (why/why not)?

<TODO>