CS 2334: Project 3
Java Collections Framework

Project 2 Lessons

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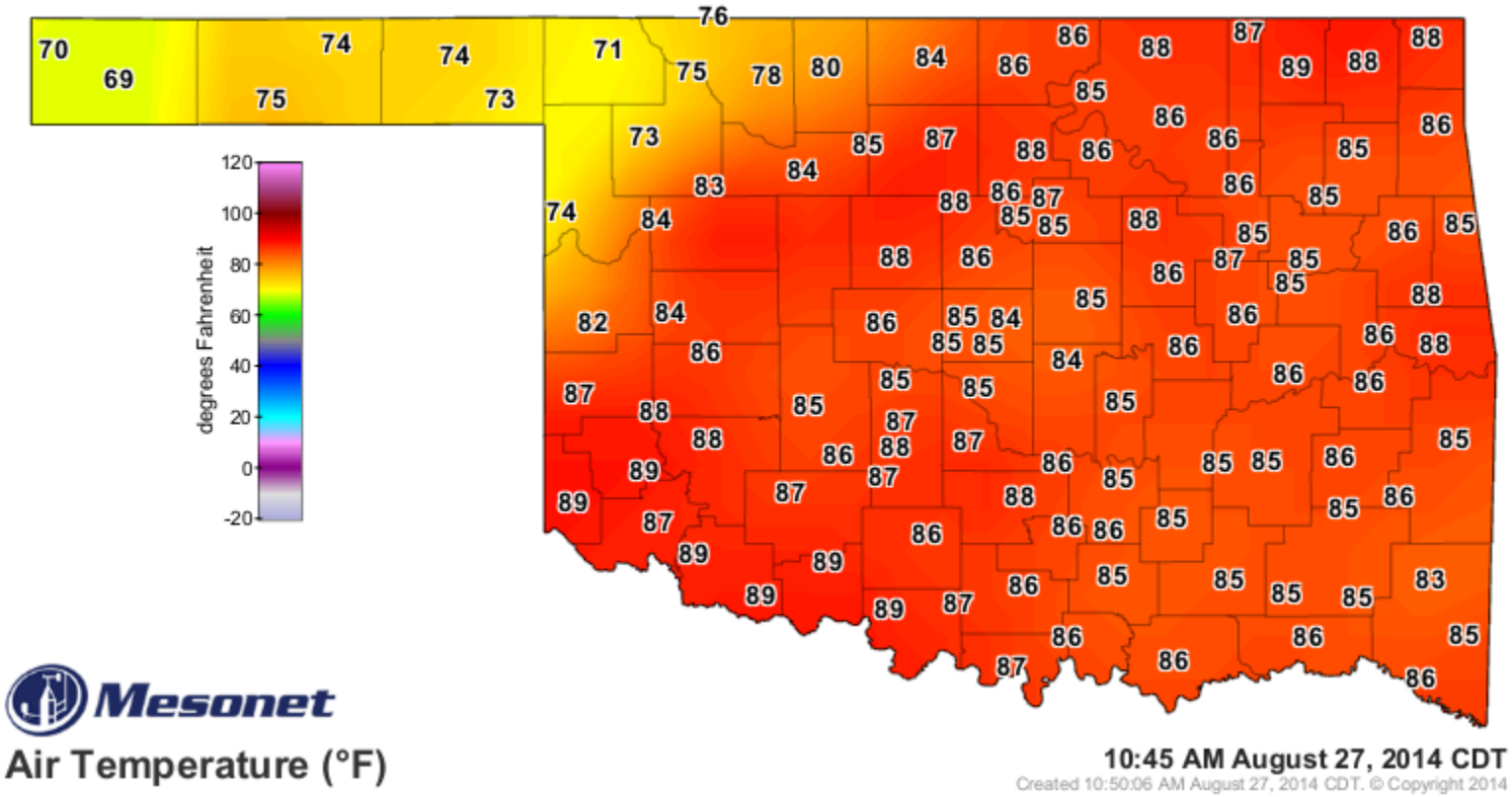
- Class hierarchies
- Code reuse through abstract classes
- Computing statistics in the presence of invalid data

- Observations: should only ask what the value is if we know that it is valid

Project 2

Expanded Mesonet data:

- Many variables
- Many stations
- Your program won't know which variables and stations there are until it is executed!



High-Level Task

- Your program first loads in the configuration files and data set
- Through System.in:
  - User selects station
  - User selects variable
- Program reports average, minimum and maximum for that variable
- Repeat

- Demonstration ….

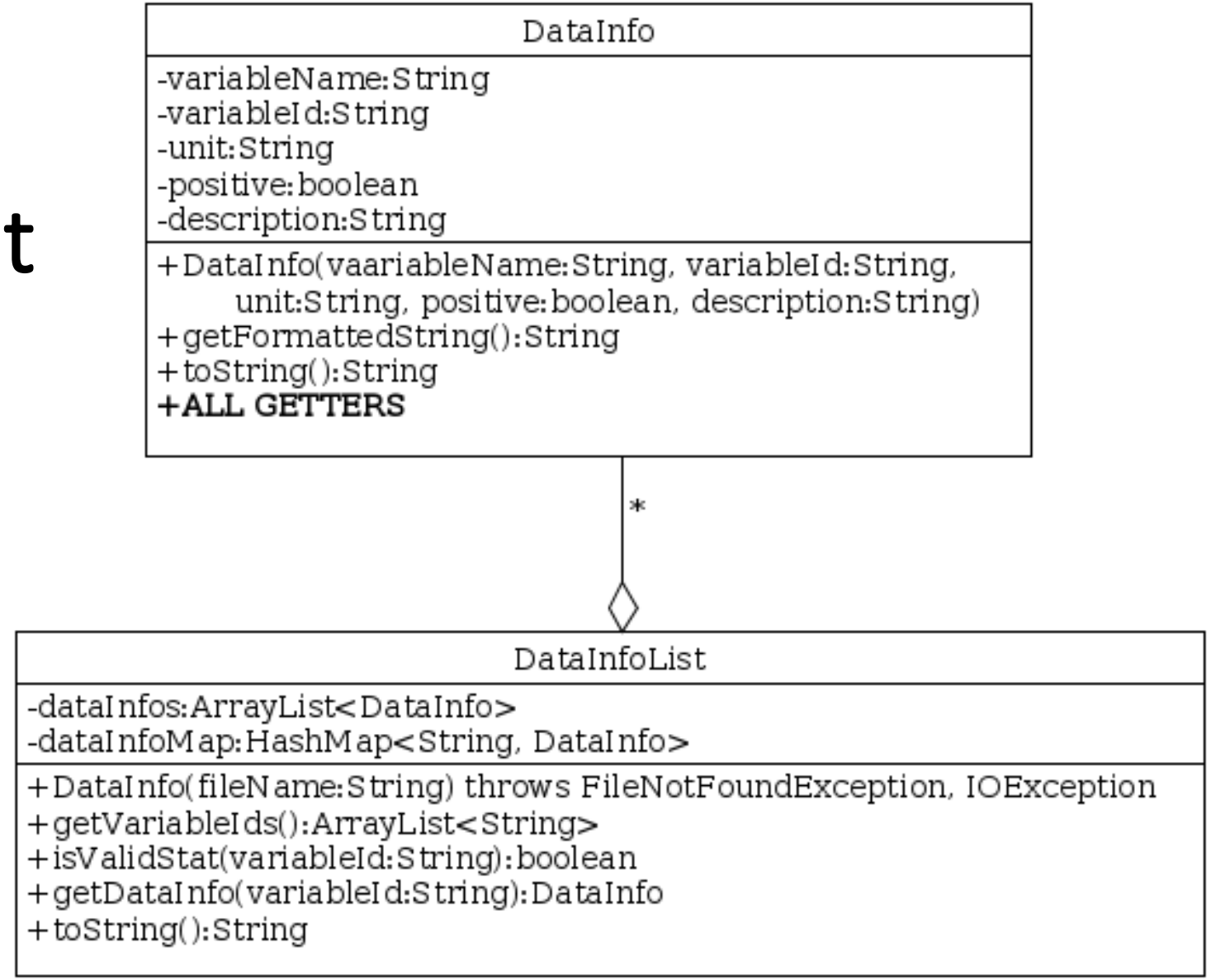
Objectives

- Make an interactive menu for a user and handle errors properly
- Make use of HashMaps and TreeMaps to flexibly store data in a structure that is efficient to access
- Compute statistics over the stored data in a manner that does not rely on *a priori* knowledge of the specifics of the data
- Continue to exercise good coding practices for Javadoc and for unit testing

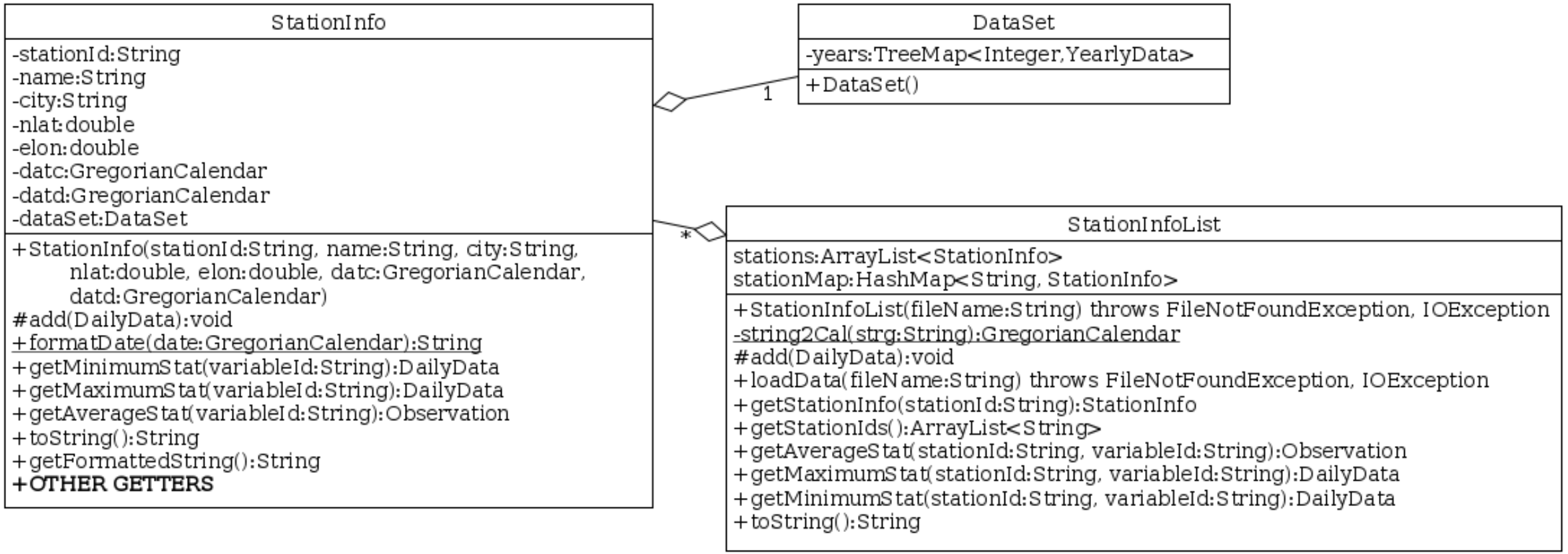
Code Refactor

- The structure of your classes will largely stay the same
- But: how many of your classes are implemented will change
- And: we add a few new classes

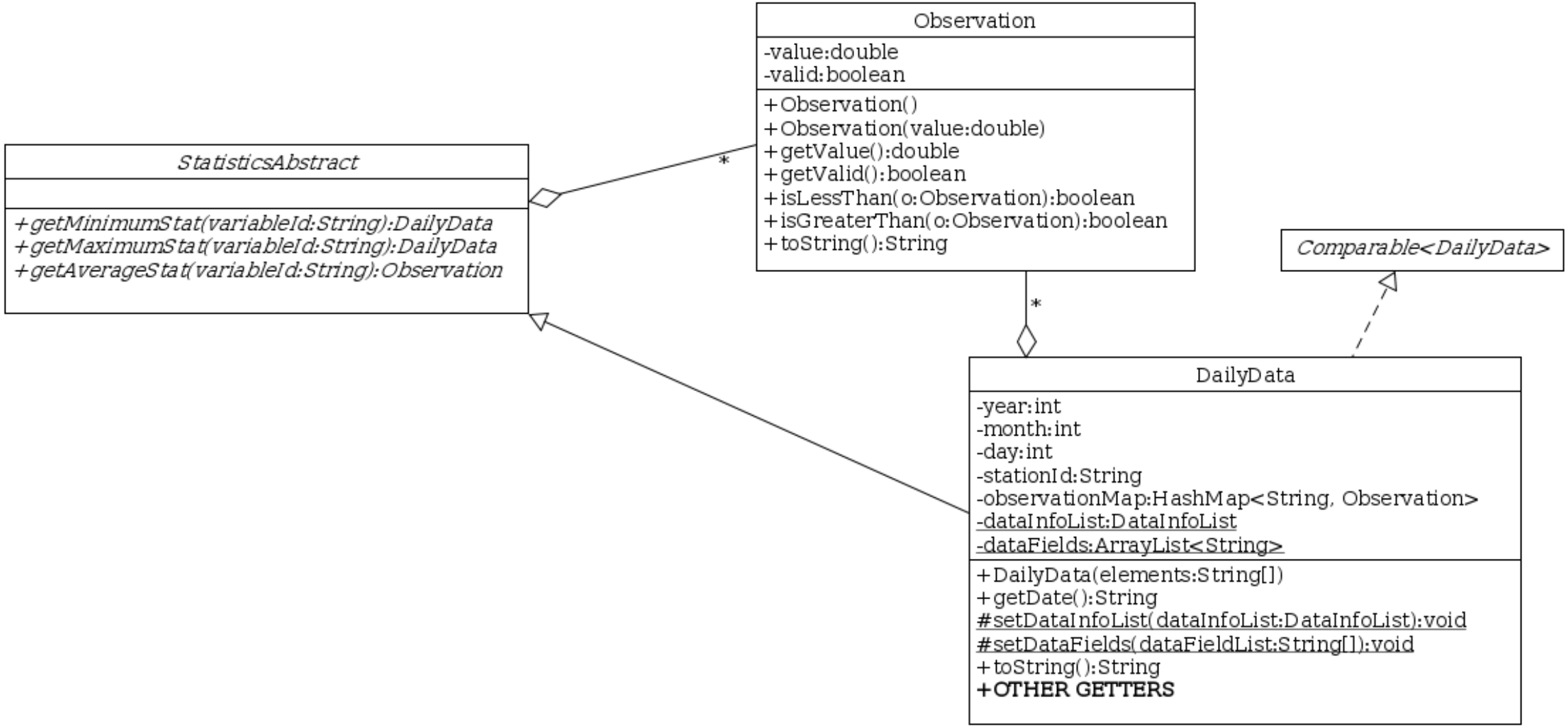
DataInfo: Store Information about Variables



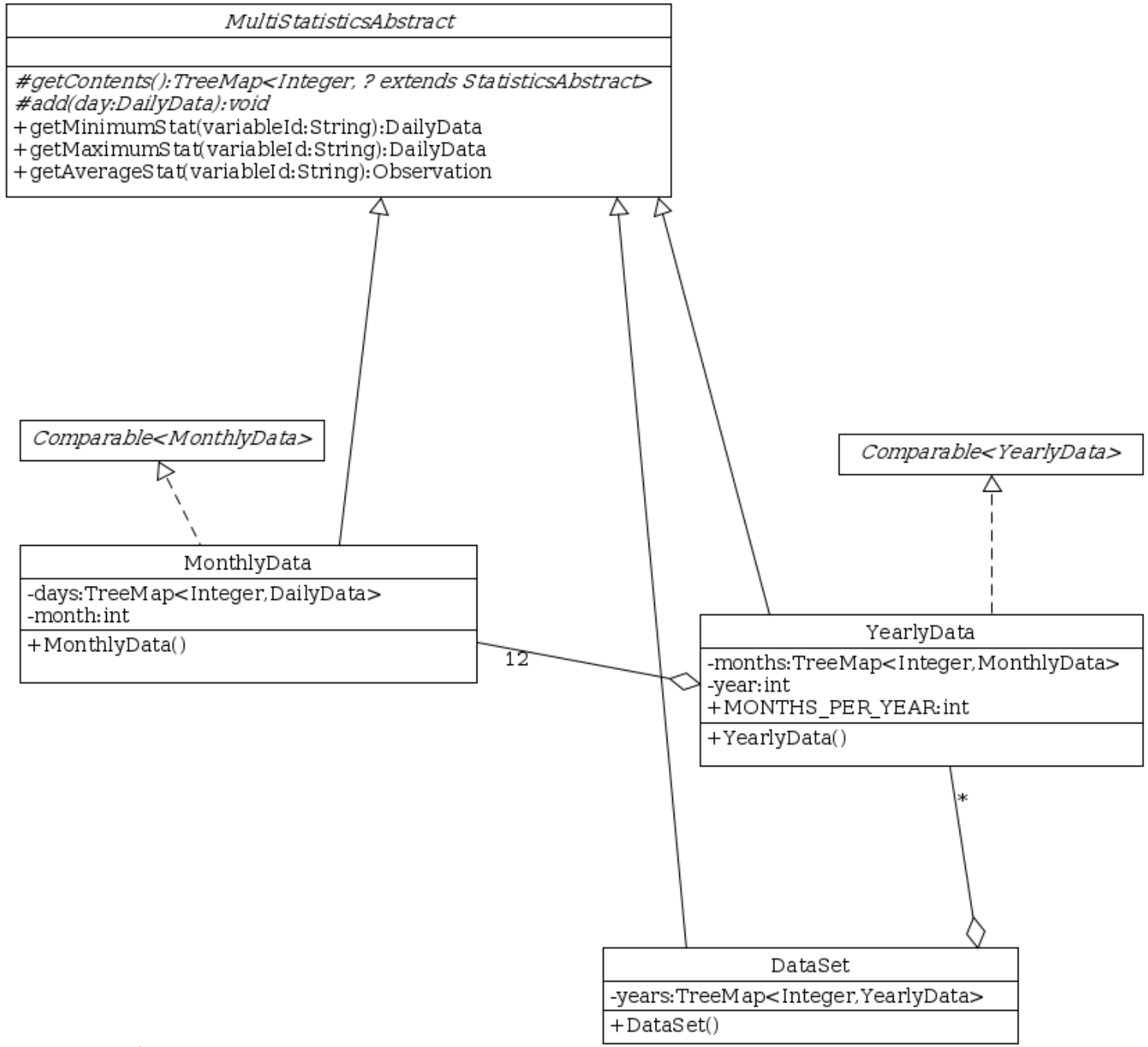
StationInfo: Detailed Information about a Station (+ the Data)



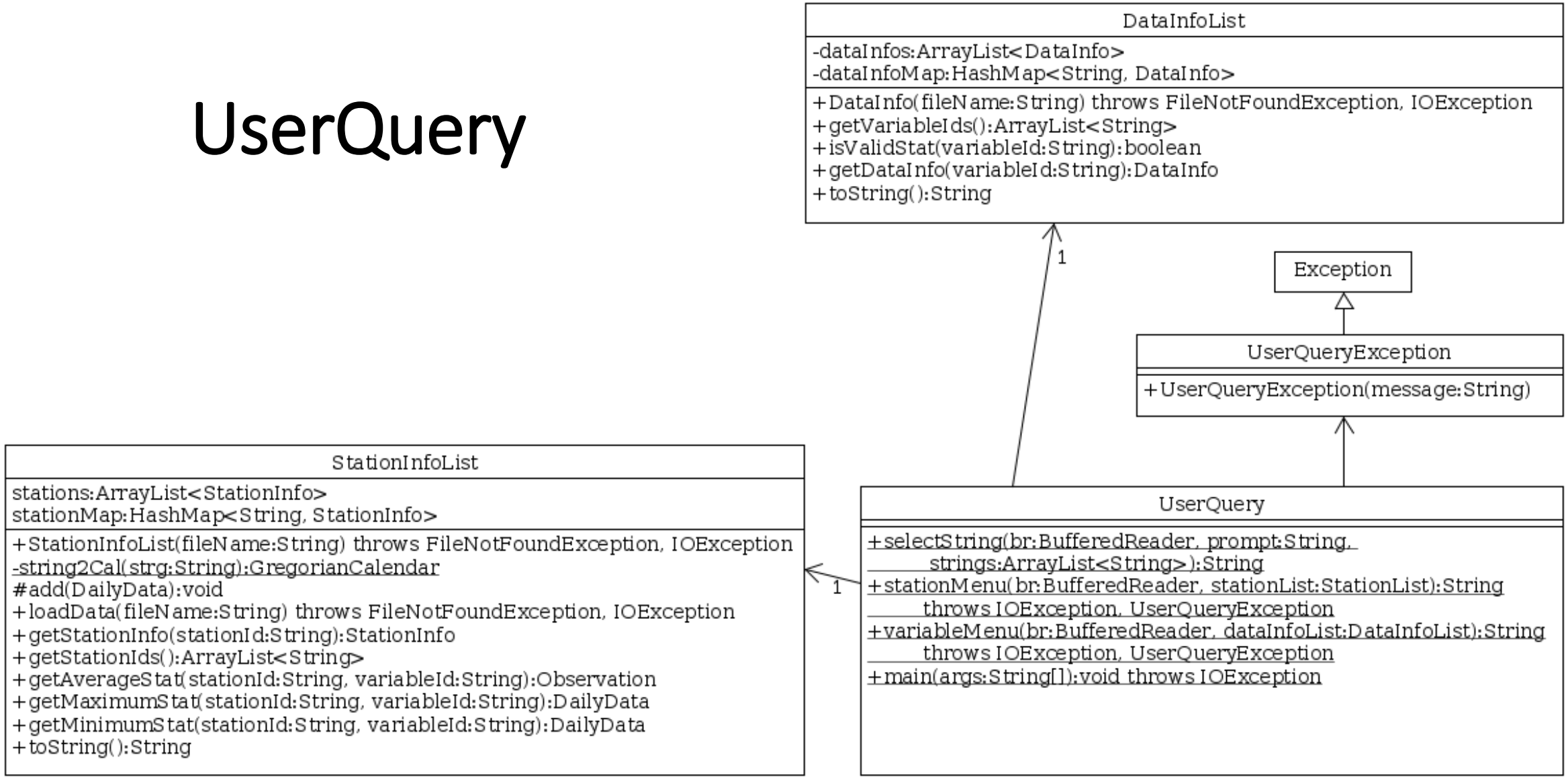
StatisticsAbstract and DailyData



MultiStatistics and Children



UserQuery


DataInfoList
-dataInfos:ArrayList<DataInfo>
-dataInfoMap:HashMap<String, DataInfo>
+DataInfo(fileName:String) throws FileNotFoundException, IOException
+getVariableIds():ArrayList<String>
+isValidStat(variableId:String):boolean
+getDataInfo(variableId:String):DataInfo
+toString():String
1
Exception
UserQueryException
+UserQueryException(message:String)
StationInfoList
stations:ArrayList<StationInfo>
stationMap:HashMap<String, StationInfo>
+StationInfoList(fileName:String) throws FileNotFoundException, IOException
-string2Cal(strg:String):GregorianCalendar
#add(DailyData):void
+loadData(fileName:String) throws FileNotFoundException, IOException
+getStationInfo(stationId:String):StationInfo
+getStationIds():ArrayList<String>
+getAverageStat(stationId:String, variableId:String):Observation
+getMaximumStat(stationId:String, variableId:String):DailyData
+getMinimumStat(stationId:String, variableId:String):DailyData
+toString():String
1
UserQuery
+selectString(br:BufferedReader, prompt:String,
strings:ArrayList<String>):String
+stationMenu(br:BufferedReader, stationList:StationList):String
throws IOException, UserQueryException
+variableMenu(br:BufferedReader, dataInfoList:DataInfoList):String
throws IOException, UserQueryException
+main(args:String[]):void throws IOException

Notes

- Average, minimum and maximum statistics are computed only at the request of the user

- getMinimumStat() and getMaximumStat() can return a null under one condition:
  - If a station exists, but has no DailyData objects associated with it

Deadlines

- Project must be submitted by Monday, Nov 2nd @1:29pm
- Code review must be completed by Monday, Nov 16th