ASSIGNMENT 4 REPORT

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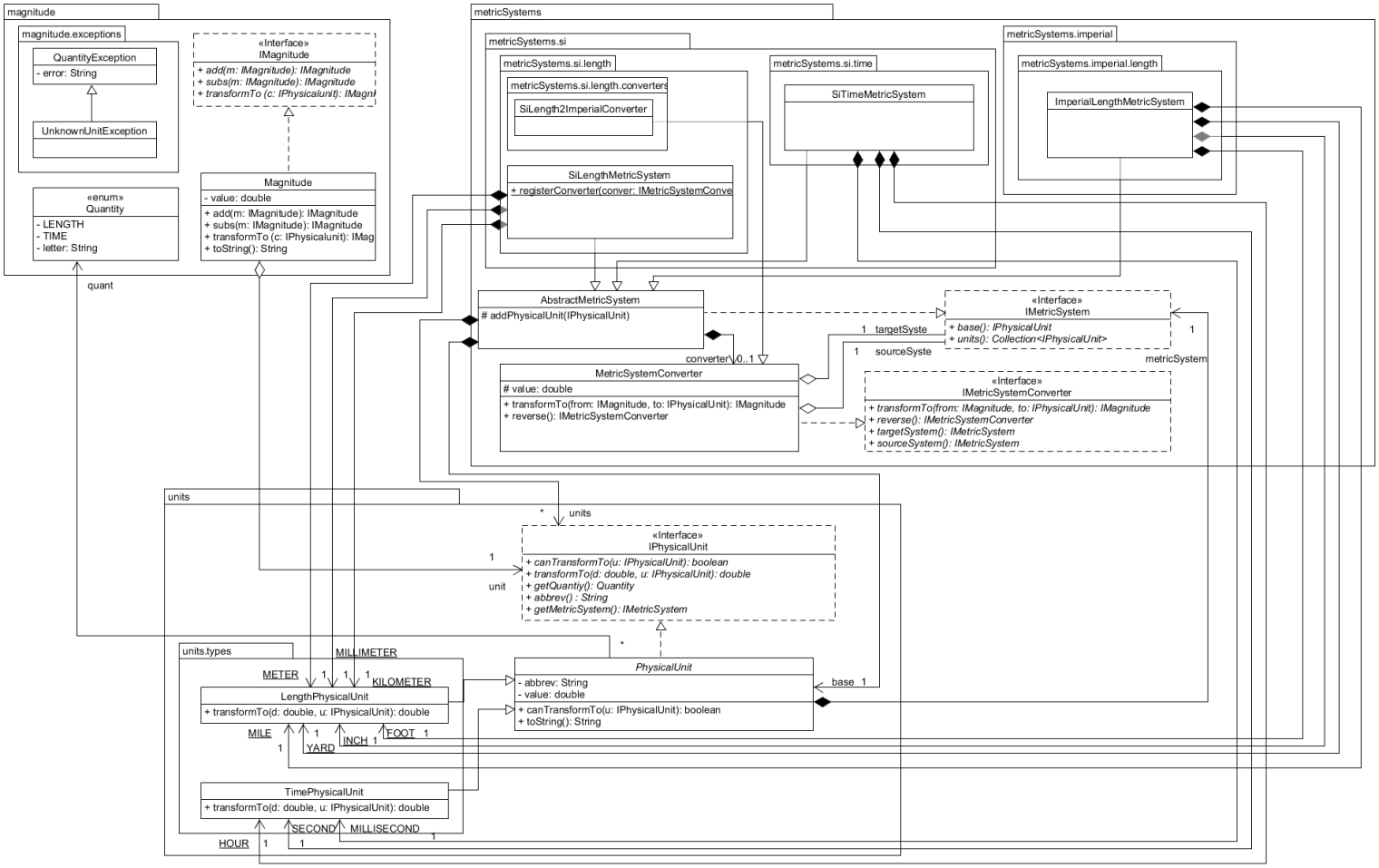
Software Analysis and Design

PART 5

a)



In this diagram we can see we have three different packages, magnitude, metricSystem and units.
The magnitude package is constructed by a class magnitude which implements the interface IMagnitude, an enum representing the Quantity and two classes for exceptions. Next the metricSystem package is a little more complex, as it has to represent the imperial system and the international system of length and time, which have been grouped accordingly. These are extensions of the abstract class, AbstractMetricSystem, which then implements the IMetricSystem interface. There is also a class and a corresponding interface for the converter between systems.
Finally we have the units package, which consists of two different unit types (LengthPhysicalUnit and TimePhysicalUnit), an abstract Physical Unit class and an Interface which it is implementing.

b)

During the development of this practice our main aim has been to create an easily extensible design. For example, to create a new unit in an already existing system, the only thing that you would have to do is to create the constant named as the unit in the system corresponding file. Then in the constructor, initialize it with its corresponding abbreviation and the value that it differs from its base unit.

To implement a new mass quantity you would need to create a new class in the si package that extends from AbstractMetricSystem, then implement the new system creating some of its units. Then you would have to create a new physicaUnit and Quantity referred to that new unit, those new classes would hold the information of that new physicalUnit (abbreviation, base value, quantity, metric system).

c)

One of the main disadvantages of this library is that in order to expand it you need to handle a lot of classes such as metric systems, quantities, physical units… But on the other hand this is what makes it a great library because it allows a very modular and extensible system.