Assignment 6

Exercise 1 (8pt)

Draw the **UML diagram** and **implement** the class **StopWatch**. The class should contain:

- The `startTime` and `endTime`
- An no-args constructor that initialises the start time with the current time
- A method `star` that resets the start time
- A method `stop` that sets the end time
- A method `getElapsedTime` that returns the elapsed time in seconds.
- Use the class to measure the performances of summing a billion of positive numbers

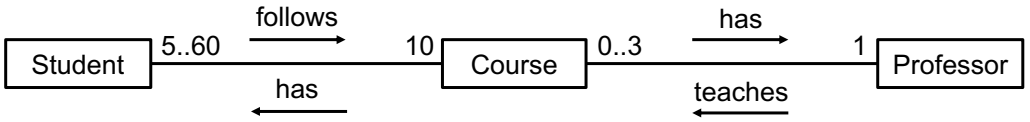
Exercise 2 (8pt)

Draw the **UML diagram** and **implement** the class **QuadraticEquation** ($ax^2 + bx + c = 0$). The class should contain:

- A field for each coefficient `a, b, c`
- A constructor that takes the 3 coefficients
- The getters and setters for all fields
- A method `getDiscriminant` that computes the discriminant $b^2 - 4ac$
- A method `hasRealSolution` that checks if the discriminant is positive
- A method `isQuadratic` that checks if `a` is different from zero
- A method `hasDuplicatedSolution` that checks if the discriminant is zero
- Two methods `getSolution1` and `getSolution2` that returns the two solutions (if any)
  solution1 = (-b+sqrt(discriminant))/(2a) solution2 = (-b-sqrt(discriminant))/(2a)

Exercise 3 (4pt)

Implement the code that follows this UML diagram.



Add methods to add/remove students from courses and to assign professors to courses.

Instructions

The solution of the exercises must be provides as a **java** (for the code, do not submit class files), **png** (for eventual screenshot), and **pdf** (for eventual text) files. The **files must be zipped** together before upload.

Assignments not respecting these instructions will be ignored.