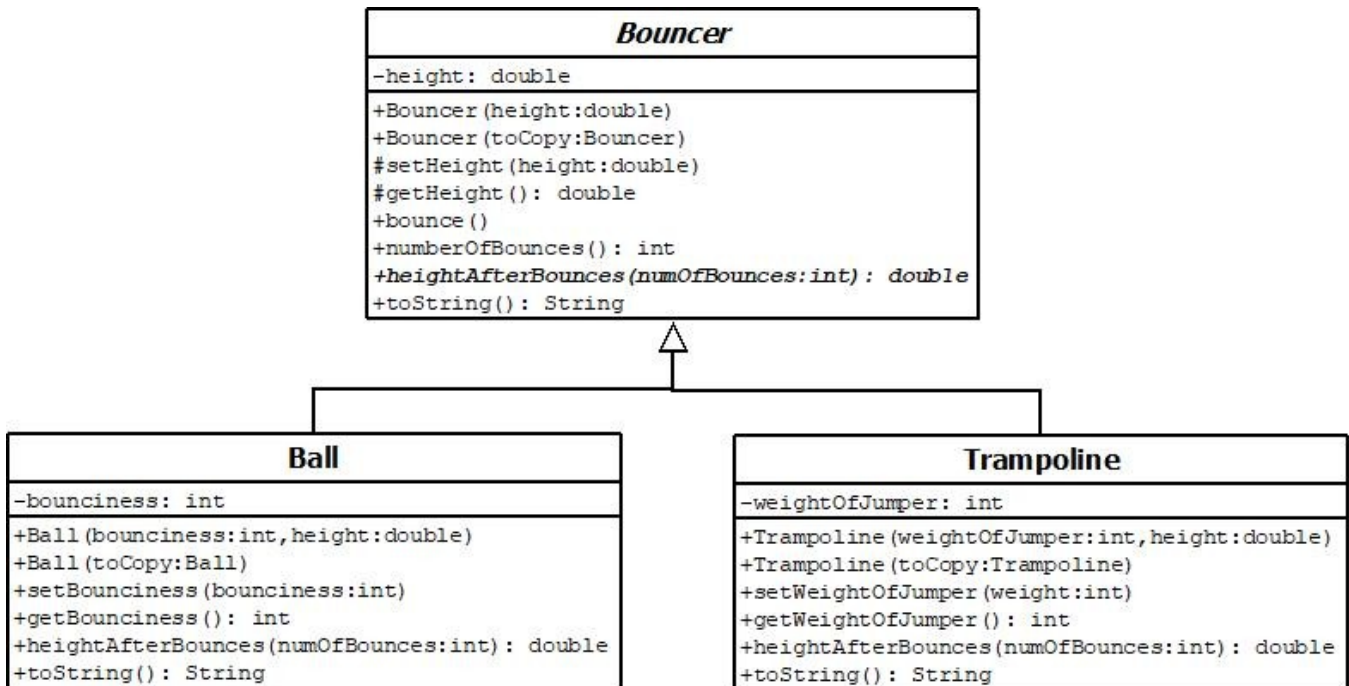


## CPSC 233 – Coding Challenge 4 – Practice 2



Note that # indicated protected access. Bold and italics indicates abstract.

**Bouncer class:** The **height** should be greater than 0. If 0 or less is provided, set it to a default of 1.0. **heightAfterBounces** is abstract and represents height after specified number of bounces. **bounce** should update the height to reflect a single bounce: implement by calling **heightAfterBounces**. **numberOfBounces**: returns number of bounces the ball takes before remaining still on the ground. A height of less than 1 means there will be no more bounces. Call **heightAfterBounces** (in a loop) to get the number of bounces. Format returned by **toString**: 'Height: <height> Number of bounces: <number>'

**Ball class:** The ball will be **bounciness**% of it's original height after a single bounce. Round a height less than 1 to 0. The bounciness is a percentage value (between 0 (exclusive) and 100 (exclusive)). Default to 50%. Format returned by **toString**: '[Ball] Height: <height> Number of bounces: <number> Bounciness: <bounciness>'

**Trampoline class:** The bounciness of a jumper is  $(\text{weight} + \text{height}) / (3.5 * \text{height})$  percent. The **weight** of the jumper is between 50 (inclusive) and 300 (inclusive) pounds. If weight is invalid, default to 140. Format returned by **toString**: '[Trampoline] Height: <height> Number of bounces: <number>'

**Notes:** Do not duplicate instance variables from parent class in child class. Instead invoke appropriate super constructor and methods in parent class. The **toString** methods in child classes should invoke **toString** in parent rather than getter methods in parent class.

**Hint:**

We can calculate the height after bounciness by the equation;

$\text{newHeight} = \text{currentHeight} * \text{bounciness}$

In the trampoline class, we can calculate bounciness as;

$\text{bounciness} = (\text{weight} + \text{currentHeight}) / (3.5 * \text{currentHeight})$  percent.