

Java programming. Exercise session I

(based on MIT 6.092 Assignment 1)

In this exercise session, you will create a program that computes the distance and the velocity of an object will fall in Earth's gravity.

Exercise instructions:

1. Create a new class called *GravityCalculator*.
2. Copy and paste the following initial version. Take a note that type of variables has to be defined:

```
class GravityCalculator {
    public static void main(String[] arguments) {

        (type of variable) gravity = -9.81; // Earth's gravity in m/s^2
        (type of variable) fallingTime = 10;

        (type of variable) initialVelocity = 0.0;
        (type of variable) finalVelocity = ;

        (type of variable) initialPosition = 0.0;
        (type of variable) finalPosition = ;

        // Add the formulas for position and velocity

        System.out.println("The object's position after " + fallingTime + "
seconds is " + finalPosition + " m.");

        // Add output line for velocity (similar to position)

    }
}
```

3. Modify the example program to compute the position and velocity of an object after falling for 10 seconds, outputting the position in meters and the velocity in meters per second. The formulas in Math notation are:

$$x(t) = 0.5 * at^2 + v_i t + x_i$$

$$v(t) = at + v_i$$

4. Run it in Eclipse (Run → Run As → Java Application).