6.092: Assignment 1

In this assignment, you will create a program that computes the distance an object will fall in Earth's gravity.

Part One

1. Create a new class called `GravityCalculator`.
2. Copy and paste the following initial version:

```
class GravityCalculator {
   public static void main(String[] arguments) {
      double gravity = -9.81;  // Earth's gravity in m/s^2
      double initialVelocity = 0.0;
      double fallingTime = 10.0;
      double initialPosition = 0.0;
      double finalPosition = 0.0;
      System.out.println("The object's position after " + fallingTime +
            " seconds is " + finalPosition + " m.");
   }
}
```

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

What is the output of the unmodified program? Include this as a comment in the source code of your submission.

Part Two

Modify the example program to compute the position of an object after falling for 10 seconds, outputting the position in meters. The formula in Math notation is:

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

Variable	Meaning	Value
a	Acceleration (m/s^2)	-9.81
t	Time (s)	10
v_i	Initial velocity (m/s)	0
x_i	Initial position	0

Note: The correct value is -490.5 m. Java will output more digits after the decimal place, but that is unimportant.

Submission Instructions

Submit your `GravityCalculator.java` file via Stellar.

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