### 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 $\rightarrow$ Run As $\rightarrow$ 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:
$\mathrm{x}(\mathrm{t})=0.5 \times \mathrm{at}^{2}+\mathrm{v}_{\mathrm{i}} \mathrm{t}+\mathrm{x}_{\mathrm{i}}$

| Variable | Meaning | Value |
| :--- | :--- | :--- |
| a | Acceleration $\left(\mathrm{m} / \mathrm{s}^{2}\right)$ | -9.81 |
| t | Time $(\mathrm{s})$ | 10 |
| $\mathrm{v}_{\mathrm{i}}$ | Initial velocity $(\mathrm{m} / \mathrm{s})$ | 0 |
| $\mathrm{x}_{\mathrm{i}}$ | 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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