Java programming. Exercise session I
(based on MIT 6.092 Assignment 1)

In this hands-on session, you will create a program that computes the distance and the velocity of an object will fall in Earth's gravity; extend the program with Java methods.

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. The formula in Math notation is:

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

4. Run the completed code in Eclipse (Run → Run As → Java Application).
5. Extend *GravityCalculator* class with the following code:

```
public class GravityCalculator {

    public static double multi(……){
       // method for multiplication
           }

// add 2 more methods for powering to square and summation (similar to multiplication)

    public static void outline(……){
       // method for printing out a result
           }

    public static void main(String[] args) {

// compute the position and velocity of an object with defined methods and print out the
result
           }
       }
```

6. Create methods for multiplication, powering to square, summation and printing out a result in ***GravityCalculator*** class.