

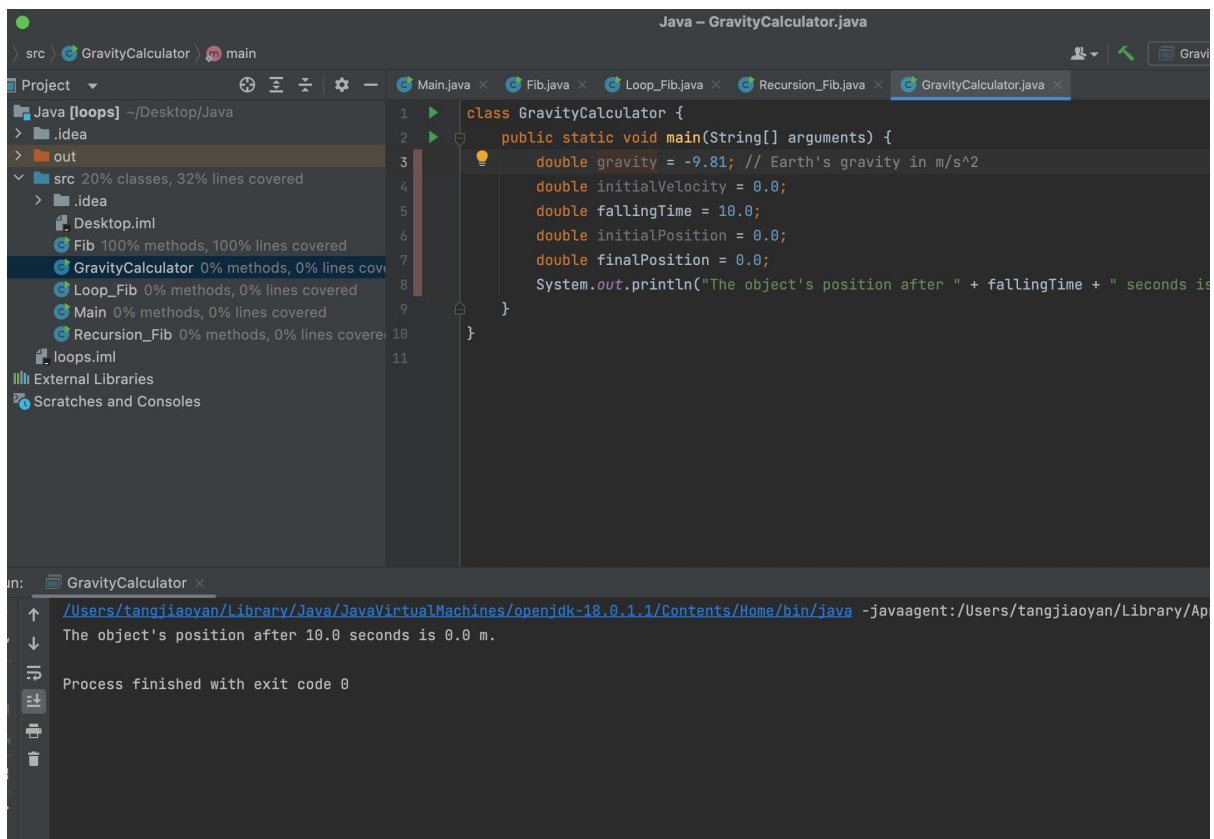
Assignment1_2

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

1. Create a new class called GravityCalculator.
2. Copy and paste the following initial version:
3. Run it in IntelliJ. What is the output of the unmodified program?

The object's position after 10.0 seconds is 0.0 m.

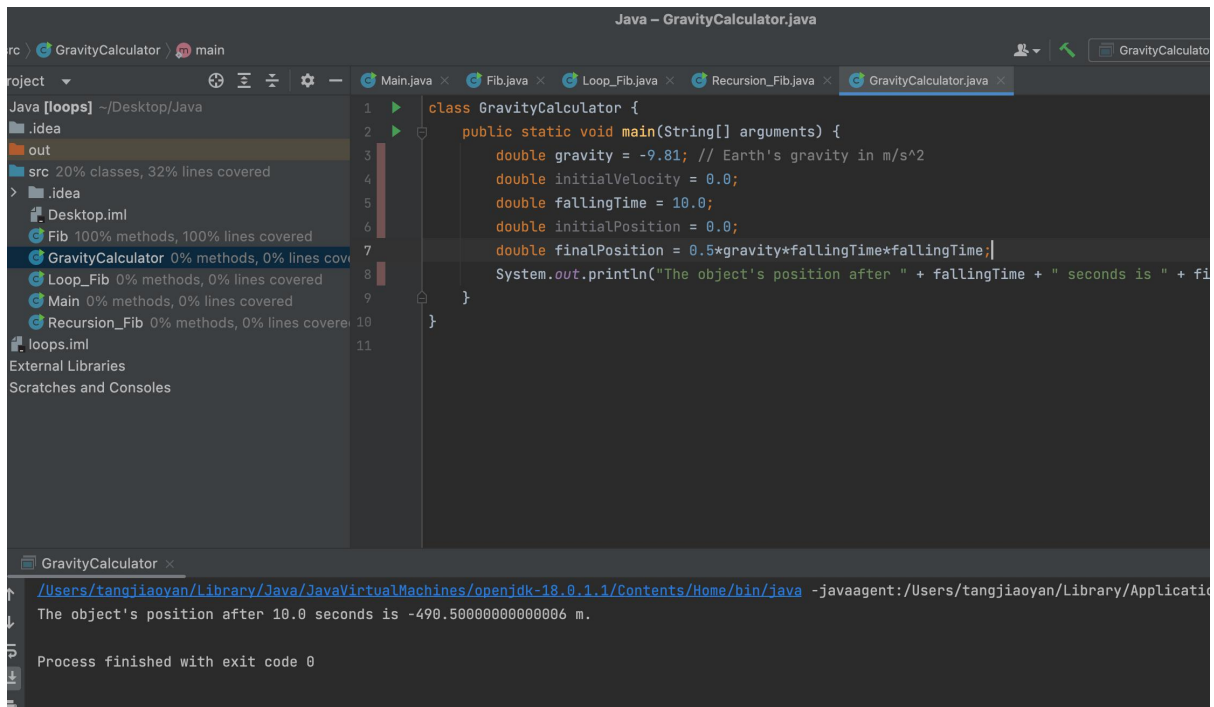


The screenshot shows the IntelliJ IDEA IDE with the GravityCalculator.java file open. The code defines a class GravityCalculator with a main method that sets gravity to -9.81, initial velocity to 0.0, falling time to 10.0, and initial position to 0.0. It then prints the final position after 10.0 seconds. The output window shows the result: "The object's position after 10.0 seconds is 0.0 m." and "Process finished with exit code 0".

```
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.");  
    }  
}
```

The object's position after 10.0 seconds is 0.0 m.
Process finished with exit code 0

4. Include this as a comment in the source code of your assignment. 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: $x(t) = 0.5 \times at^2 + vit + xi$ Variable Meaning Value a Acceleration (m/s²) -9.81 t Time (s) 10 vi Initial velocity (m/s) 0 xi Initial position 0 Note: The correct value is -490.5 m. Java will output more digits after the decimal place, but that is unimportant.



The screenshot shows an IDE window titled "Java - GravityCalculator.java". The editor displays the following code:

```
1 class GravityCalculator {
2     public static void main(String[] arguments) {
3         double gravity = -9.81; // Earth's gravity in m/s^2
4         double initialVelocity = 0.0;
5         double fallingTime = 10.0;
6         double initialPosition = 0.0;
7         double finalPosition = 0.5*gravity*fallingTime*fallingTime;
8         System.out.println("The object's position after " + fallingTime + " seconds is " + finalPosition);
9     }
10 }
11
```

The left sidebar shows a project structure with files like Main.java, Fib.java, Loop_Fib.java, Recursion_Fib.java, and GravityCalculator.java. The bottom console shows the output:

```
/Users/tangjiaoyan/Library/Java/JavaVirtualMachines/openjdk-18.0.1.1/Contents/Home/bin/java -javaagent:/Users/tangjiaoyan/Library/Java/JavaVirtualMachines/openjdk-18.0.1.1/Contents/Home/bin/java -jar GravityCalculator.jar
The object's position after 10.0 seconds is -490.50000000000006 m.
Process finished with exit code 0
```

Code:

```
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 = 0.5*gravity*fallingTime*fallingTime;
        System.out.println("The object's position after " + fallingTime + " seconds is " + finalPosition + " m.");
    }
}
```