

# Software Quality

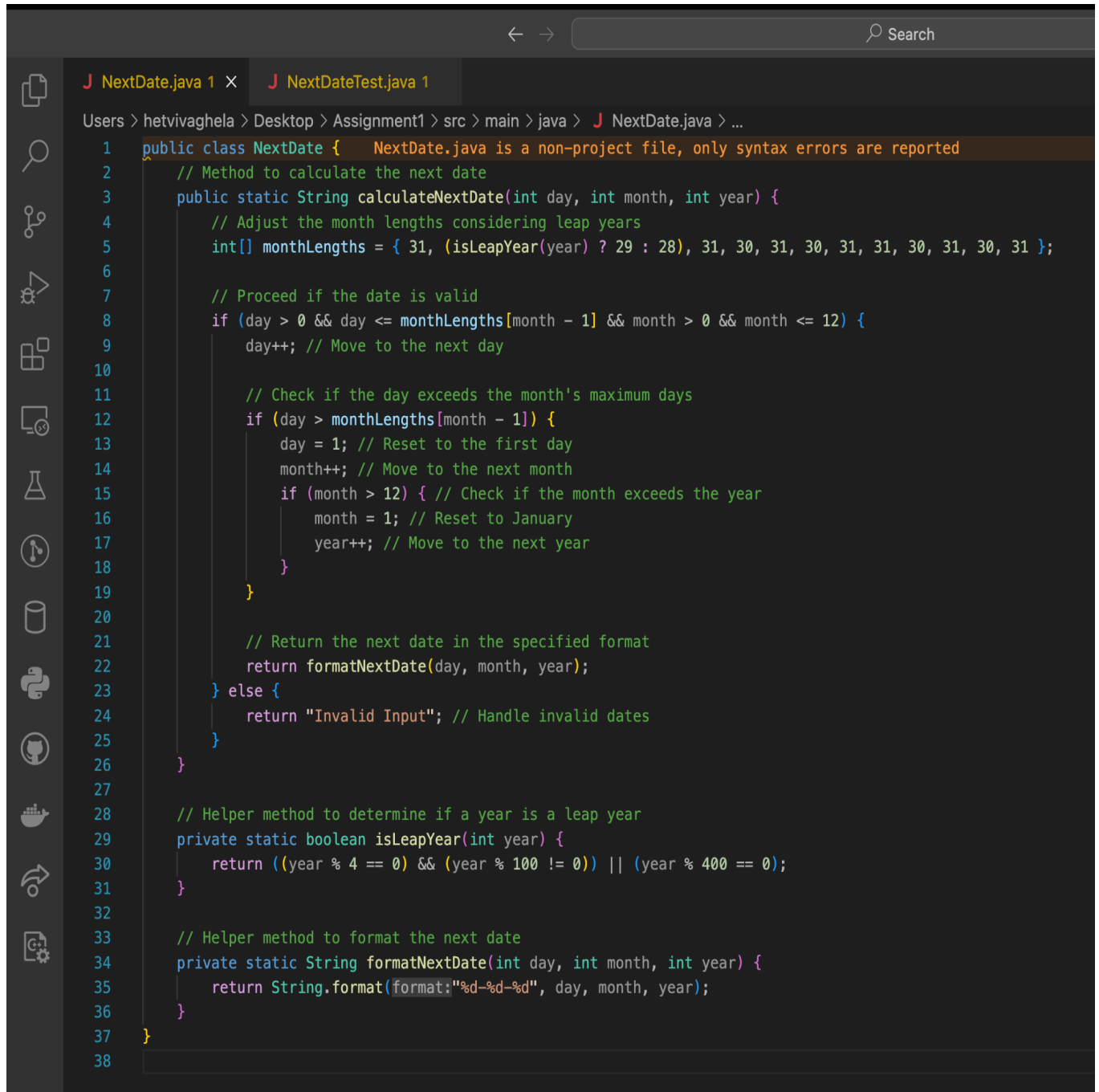
## Homework Assignment 1

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Test cases table:

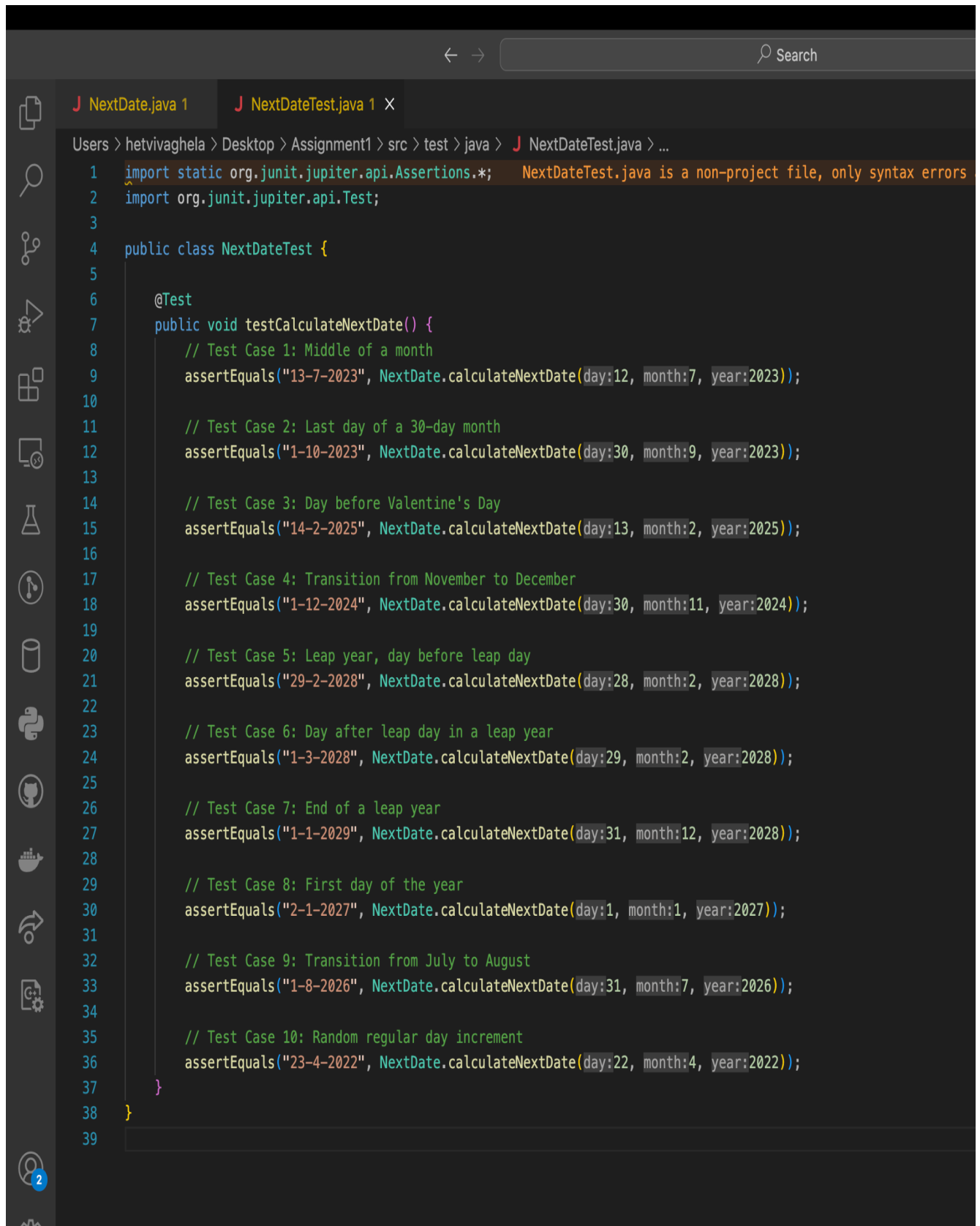
Test Case ID	Description	Day	Month	Year	Expected Output
1	Middle of a month	12	7	2023	13-7-2023
2	Last day of a 30-day month	30	9	2023	1-10-2023
3	Day before Valentine's Day	13	2	2025	14-2-2025
4	Transition from November to December	30	11	2024	1-12-2024
5	Leap year, day before leap day	28	2	2028	29-2-2028
6	Day after leap day in a leap year	29	2	2028	1-3-2028
7	End of a leap year	31	12	2028	1-1-2029
8	First day of the year	1	1	2027	2-1-2027
9	Transition from July to August	31	7	2026	1-8-2026
10	Random regular day increment	22	4	2022	23-4-2022

## NextDate.java File



```
1 public class NextDate {
2     // Method to calculate the next date
3     public static String calculateNextDate(int day, int month, int year) {
4         // Adjust the month lengths considering leap years
5         int[] monthLengths = { 31, (isLeapYear(year) ? 29 : 28), 31, 30, 31, 30, 31, 31, 30, 31, 30, 31 };
6
7         // Proceed if the date is valid
8         if (day > 0 && day <= monthLengths[month - 1] && month > 0 && month <= 12) {
9             day++; // Move to the next day
10
11             // Check if the day exceeds the month's maximum days
12             if (day > monthLengths[month - 1]) {
13                 day = 1; // Reset to the first day
14                 month++; // Move to the next month
15                 if (month > 12) { // Check if the month exceeds the year
16                     month = 1; // Reset to January
17                     year++; // Move to the next year
18                 }
19             }
20
21             // Return the next date in the specified format
22             return formatNextDate(day, month, year);
23         } else {
24             return "Invalid Input"; // Handle invalid dates
25         }
26     }
27
28     // Helper method to determine if a year is a leap year
29     private static boolean isLeapYear(int year) {
30         return ((year % 4 == 0) && (year % 100 != 0)) || (year % 400 == 0);
31     }
32
33     // Helper method to format the next date
34     private static String formatNextDate(int day, int month, int year) {
35         return String.format("format: \"%d-%d-%d\"", day, month, year);
36     }
37 }
38
```

## NextDateTest.java File:



```
1 import static org.junit.jupiter.api.Assertions.*;
2 import org.junit.jupiter.api.Test;
3
4 public class NextDateTest {
5
6     @Test
7     public void testCalculateNextDate() {
8         // Test Case 1: Middle of a month
9         assertEquals("13-7-2023", NextDate.calculateNextDate(day:12, month:7, year:2023));
10
11         // Test Case 2: Last day of a 30-day month
12         assertEquals("1-10-2023", NextDate.calculateNextDate(day:30, month:9, year:2023));
13
14         // Test Case 3: Day before Valentine's Day
15         assertEquals("14-2-2025", NextDate.calculateNextDate(day:13, month:2, year:2025));
16
17         // Test Case 4: Transition from November to December
18         assertEquals("1-12-2024", NextDate.calculateNextDate(day:30, month:11, year:2024));
19
20         // Test Case 5: Leap year, day before leap day
21         assertEquals("29-2-2028", NextDate.calculateNextDate(day:28, month:2, year:2028));
22
23         // Test Case 6: Day after leap day in a leap year
24         assertEquals("1-3-2028", NextDate.calculateNextDate(day:29, month:2, year:2028));
25
26         // Test Case 7: End of a leap year
27         assertEquals("1-1-2029", NextDate.calculateNextDate(day:31, month:12, year:2028));
28
29         // Test Case 8: First day of the year
30         assertEquals("2-1-2027", NextDate.calculateNextDate(day:1, month:1, year:2027));
31
32         // Test Case 9: Transition from July to August
33         assertEquals("1-8-2026", NextDate.calculateNextDate(day:31, month:7, year:2026));
34
35         // Test Case 10: Random regular day increment
36         assertEquals("23-4-2022", NextDate.calculateNextDate(day:22, month:4, year:2022));
37     }
38 }
39
```

Run on terminal: maven clean package

## Build Successful

```
Assignment1 — -zsh — 108x38
/junit-platform-engine-1.9.3.jar (189 kB at 703 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/junit/platform/junit-platform-launcher/1.8.0/junit-platform-launcher-1.8.0.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/junit/platform/junit-platform-launcher/1.8.0/junit-platform-launcher-1.8.0.pom (3.0 kB at 23 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/junit/platform/junit-platform-launcher/1.8.0/junit-platform-launcher-1.8.0.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/junit/platform/junit-platform-launcher/1.8.0/junit-platform-launcher-1.8.0.jar (160 kB at 709 kB/s)
[INFO]
[INFO] -----
[INFO] T E S T S
[INFO] -----
[INFO] Running NextDateTest
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.027 s -- in NextDateTest
[INFO]
[INFO] Results:
[INFO]
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0
[INFO]
[INFO] --- jar:3.3.0:jar (default-jar) @ NextDate ---
Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/shared/file-management/3.1.0/file-management-3.1.0.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/shared/file-management/3.1.0/file-management-3.1.0.pom (4.5 kB at 236 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/shared/file-management/3.1.0/file-management-3.1.0.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/shared/file-management/3.1.0/file-management-3.1.0.jar (36 kB at 211 kB/s)
[INFO] Building jar: /Users/hetvivaghela/Desktop/Assignment1/target/NextDate-1.0-SNAPSHOT.jar
[INFO]
[INFO] BUILD SUCCESS
[INFO]
[INFO] -----
[INFO] Total time: 7.612 s
[INFO] Finished at: 2024-02-28T23:41:20-05:00
[INFO]
(base) hetvivaghela@Hetvis-MacBook-Pro Assignment1 %
```