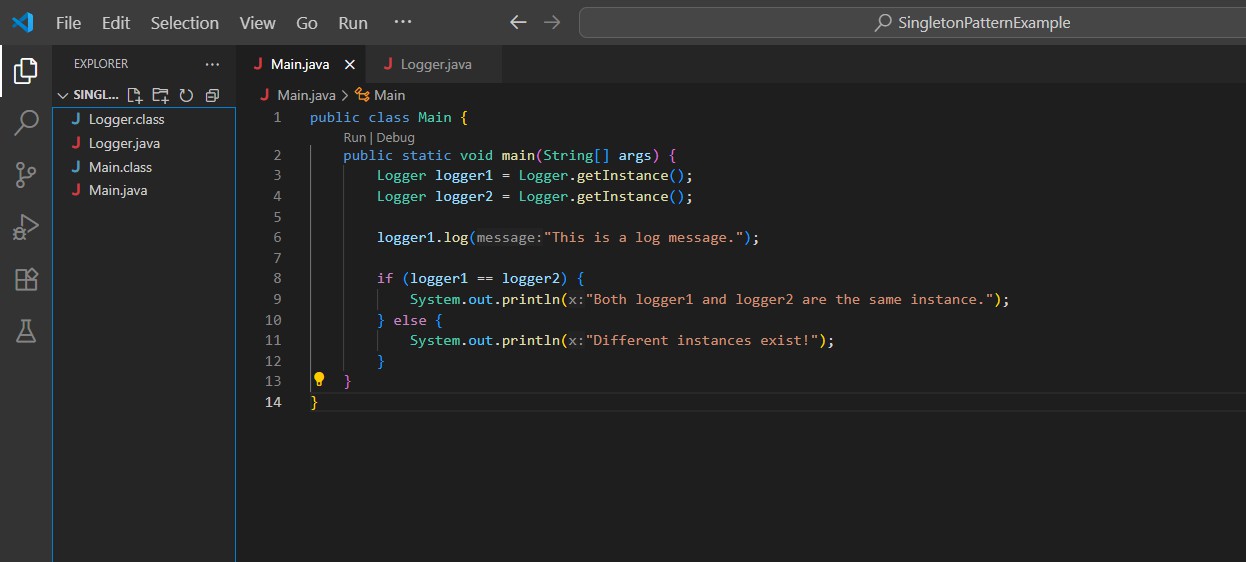
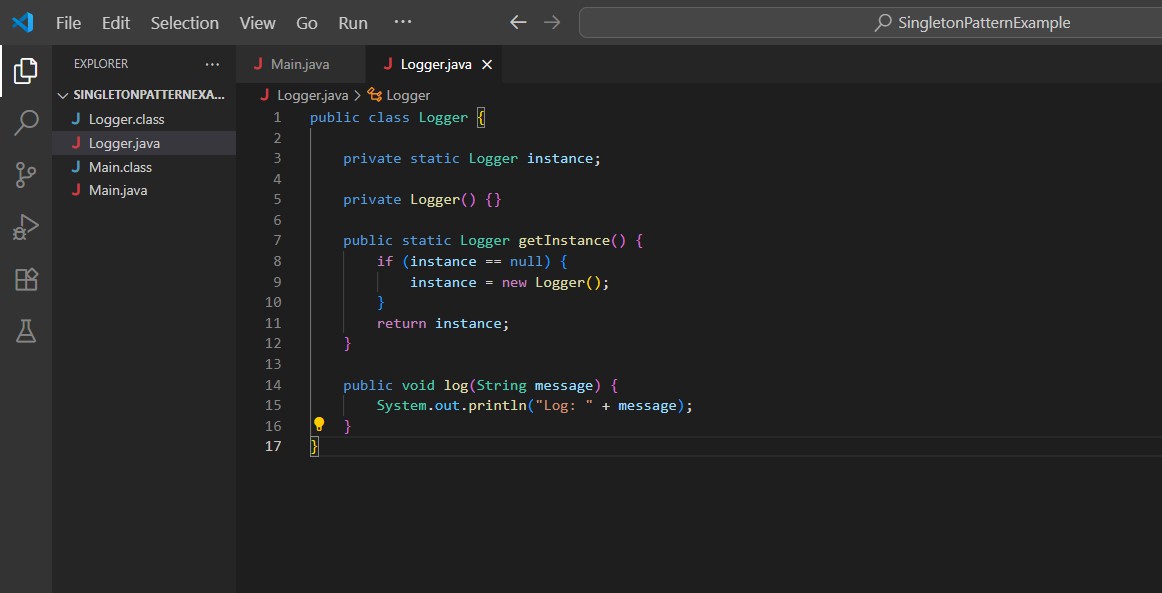
Week- 1 Mandatory Hands-On Superset Id: 6361403 Name: Lokesh ojha

# Design Patterns and principles Exercise 1: Implementing the Singleton Pattern

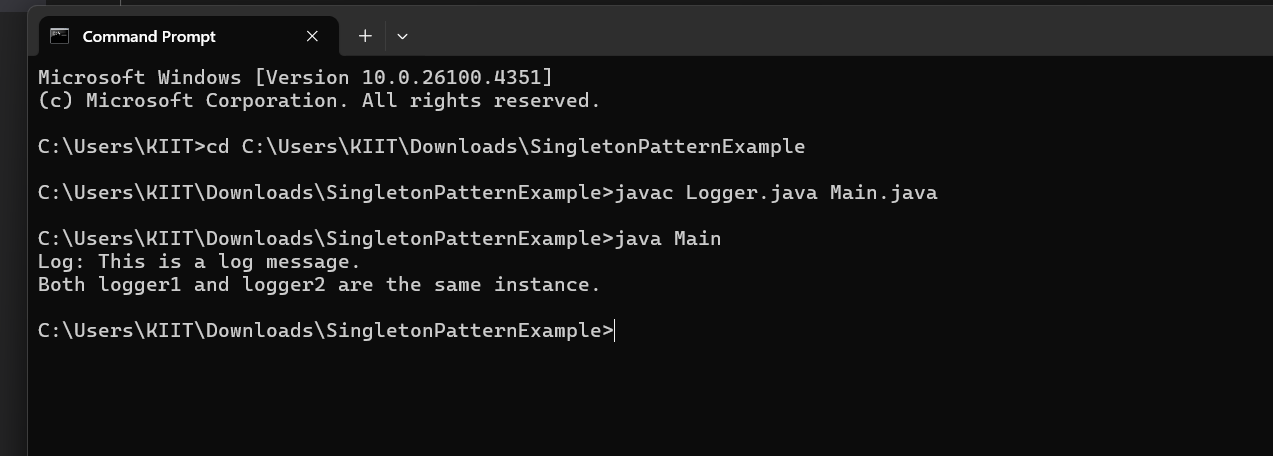
Main.java



Logger.java

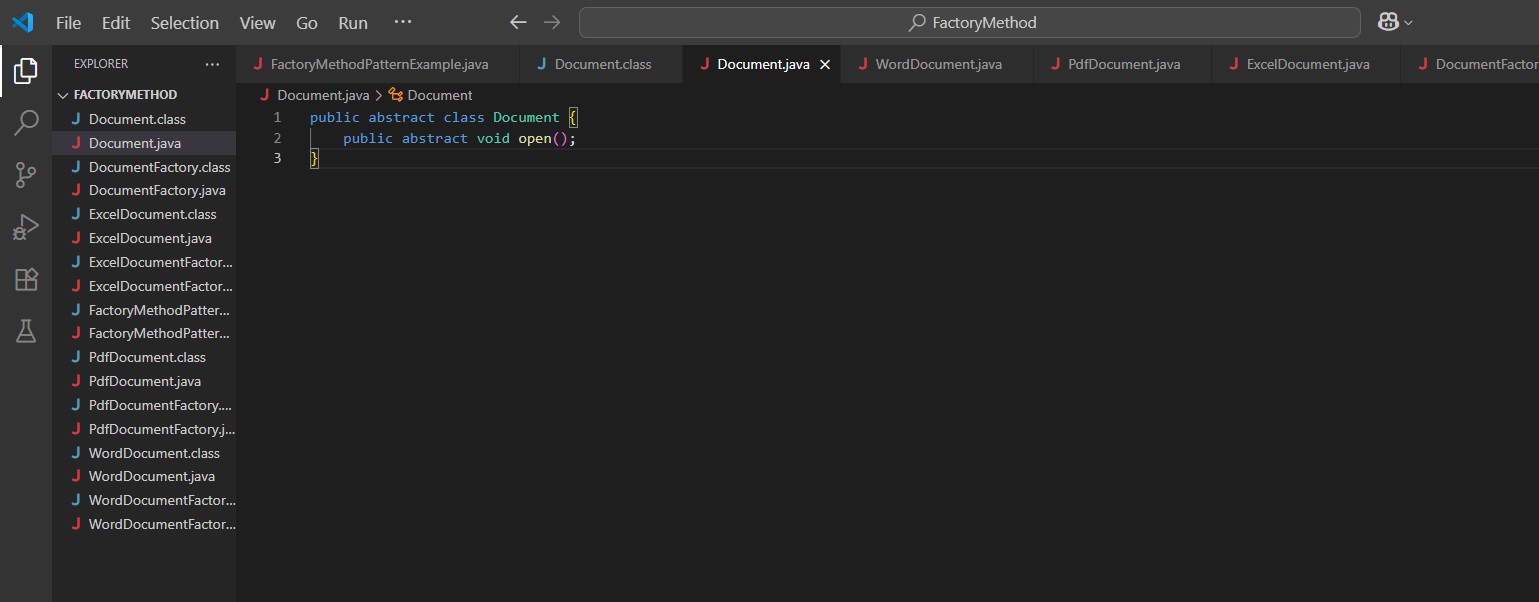


Output:

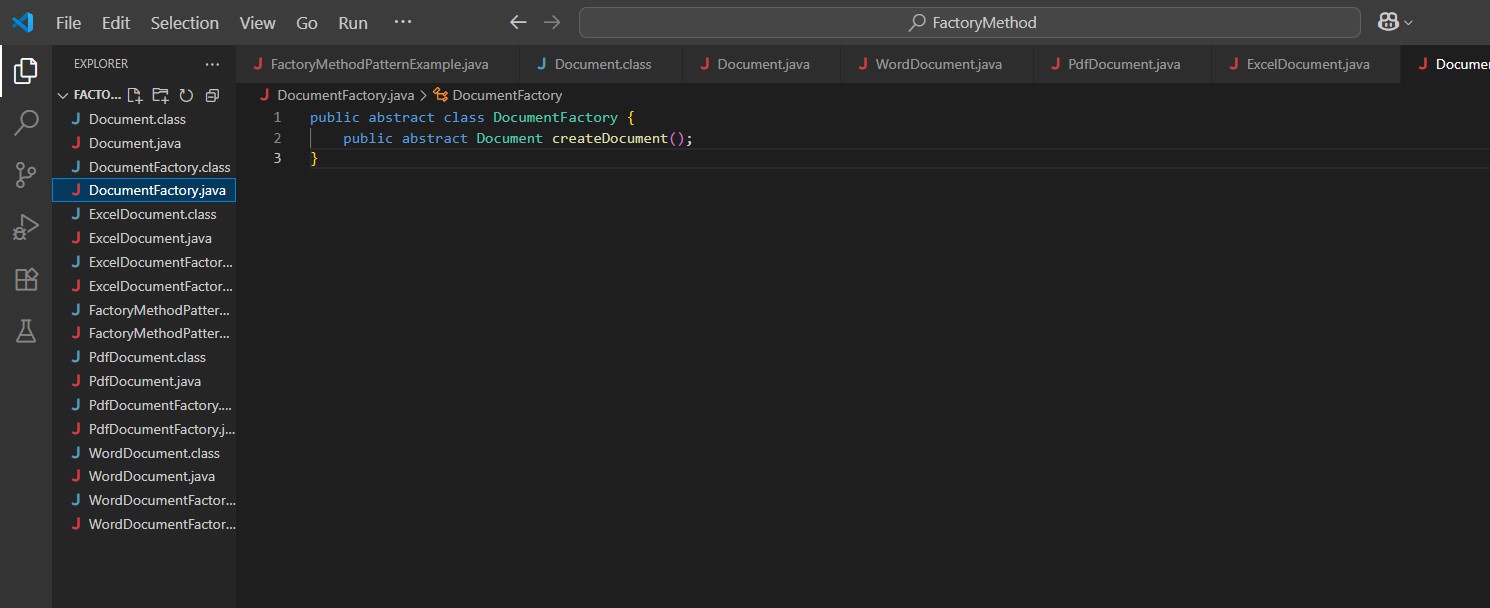


# Exercise 2: Implementing the Factory Method Pattern

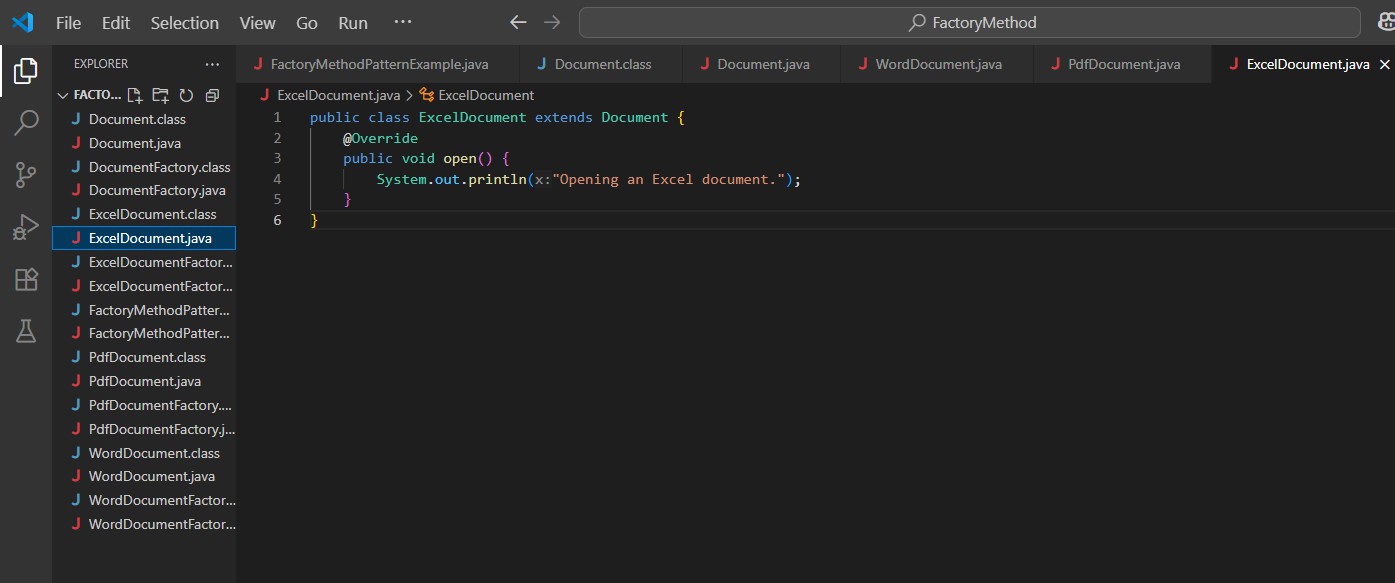
Document.java



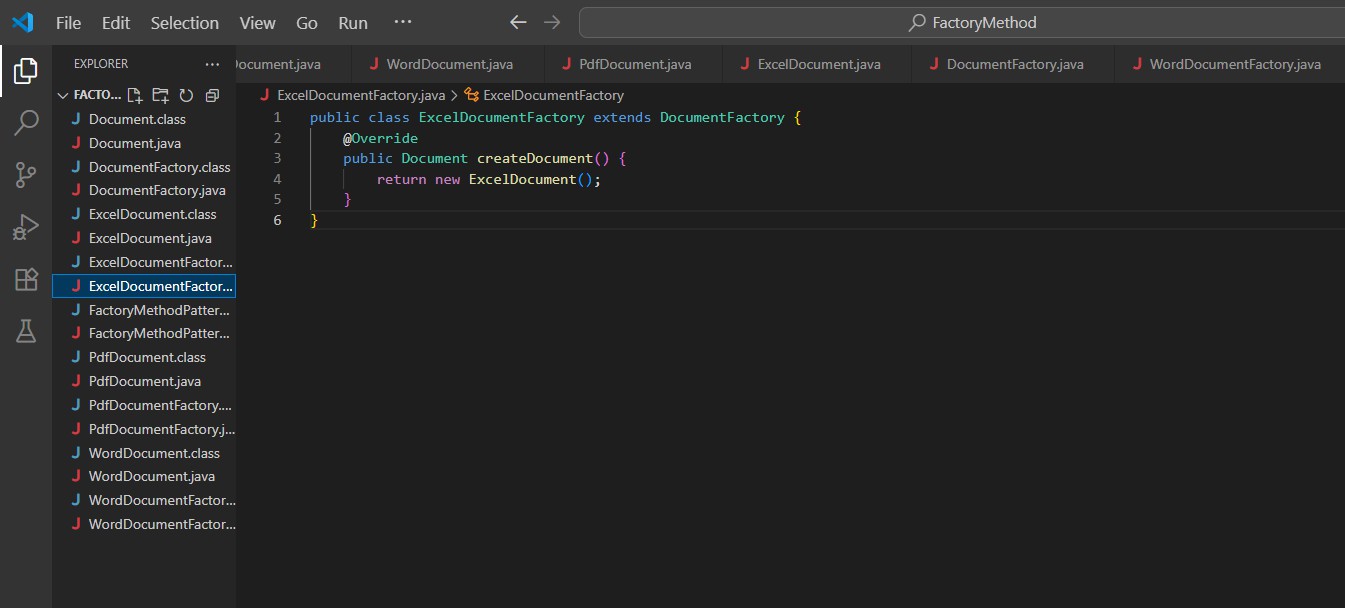
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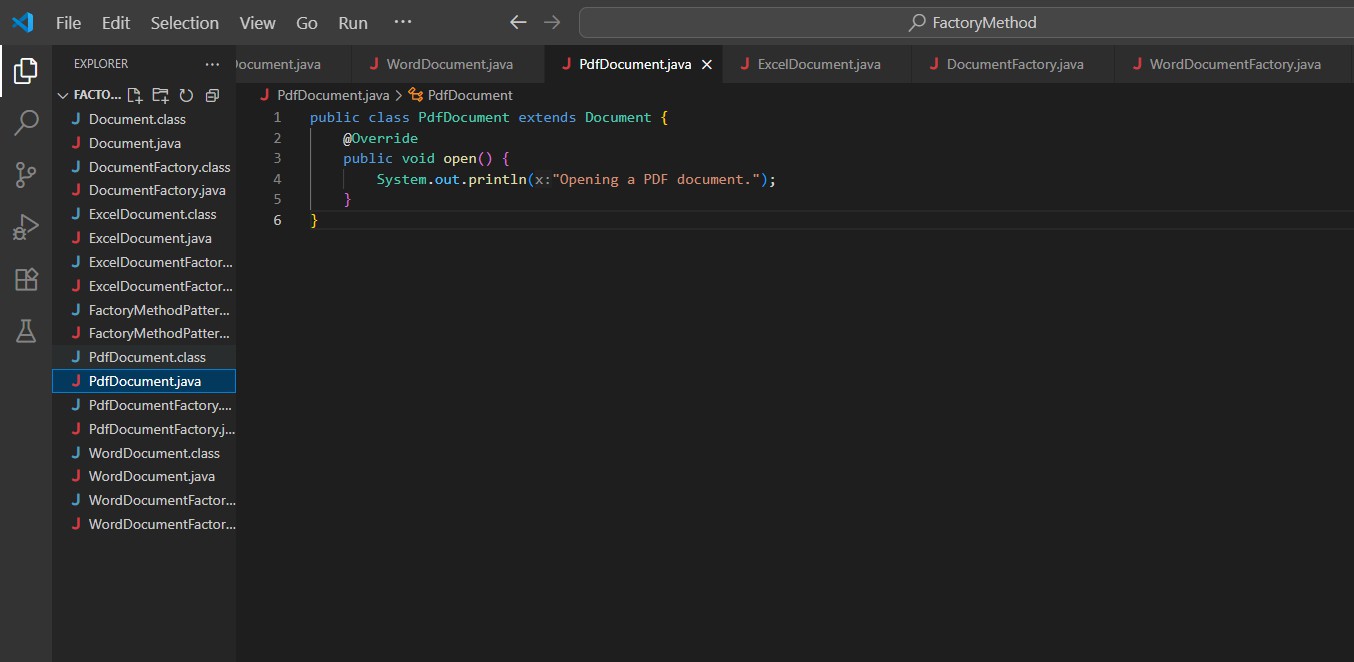
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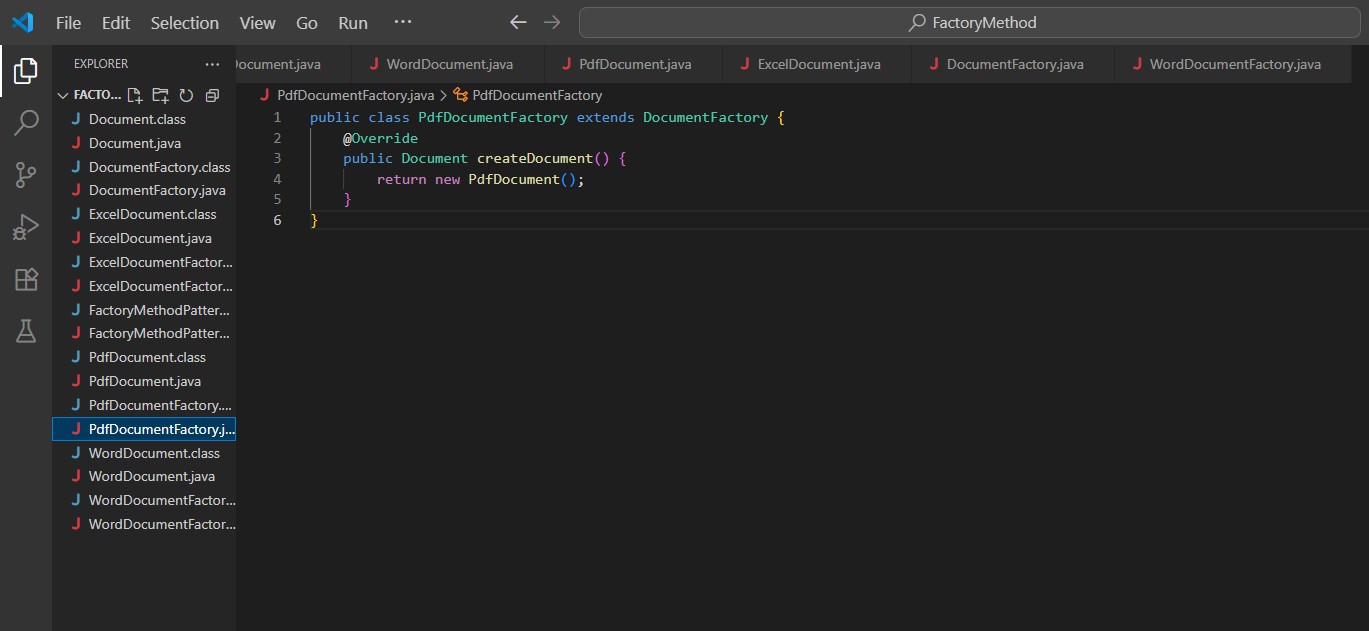
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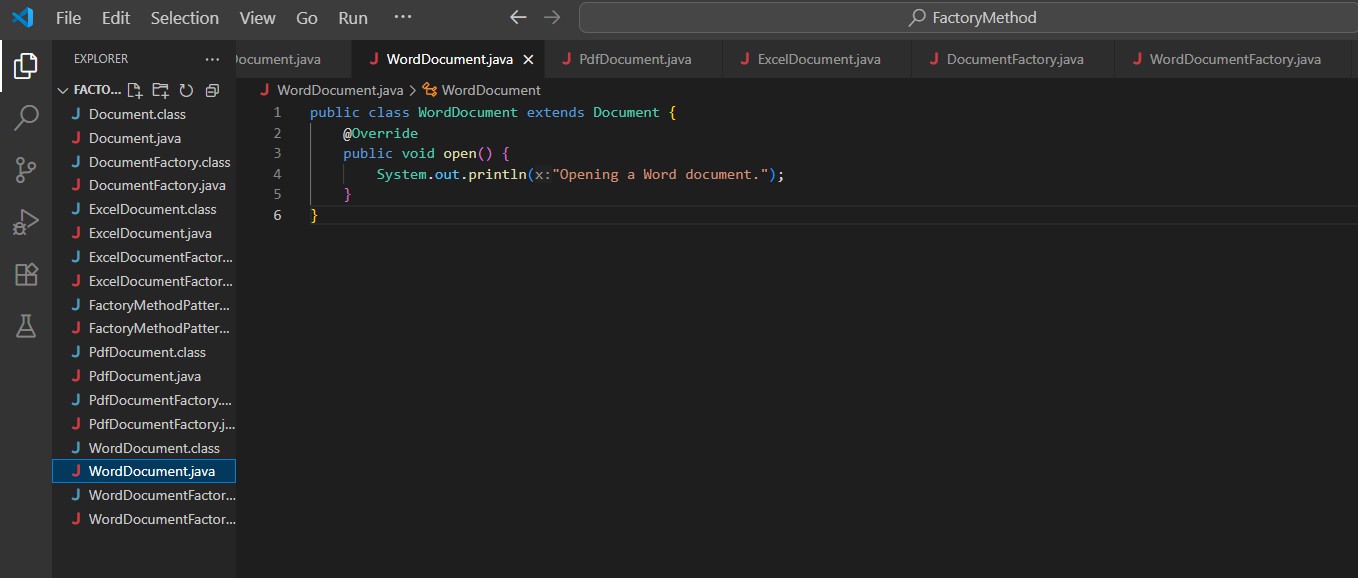
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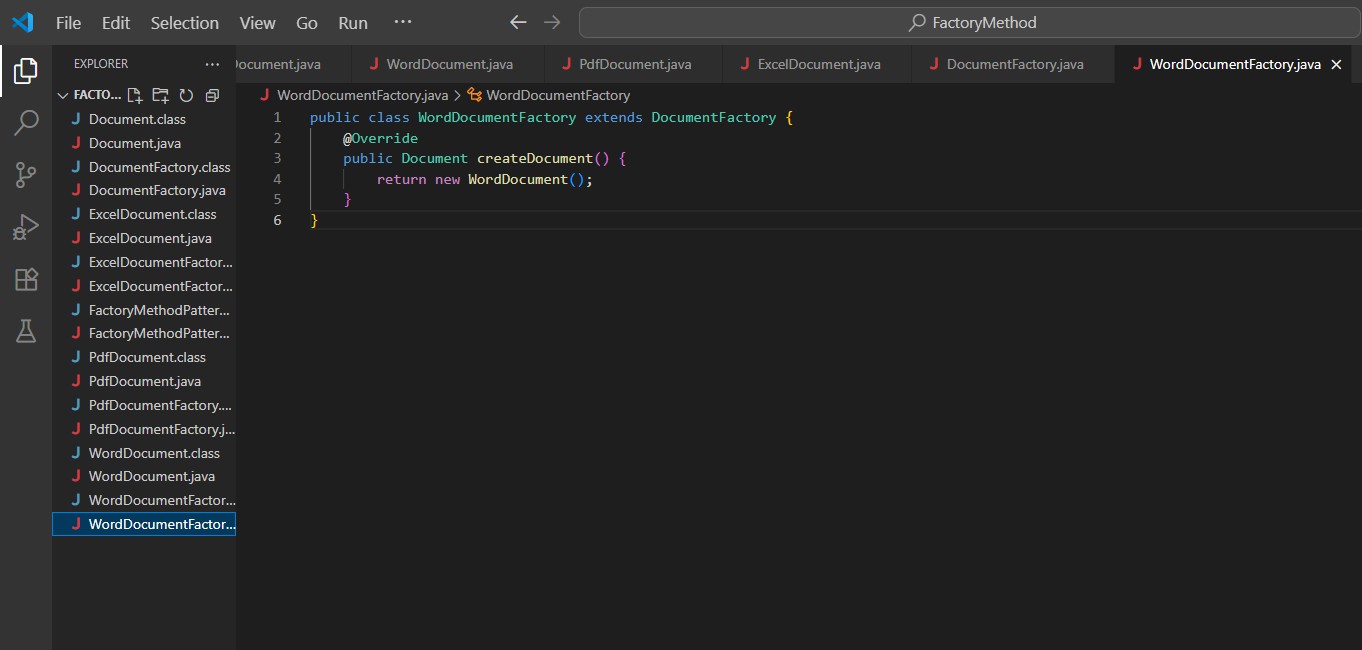
PdfDocumentFactory.java



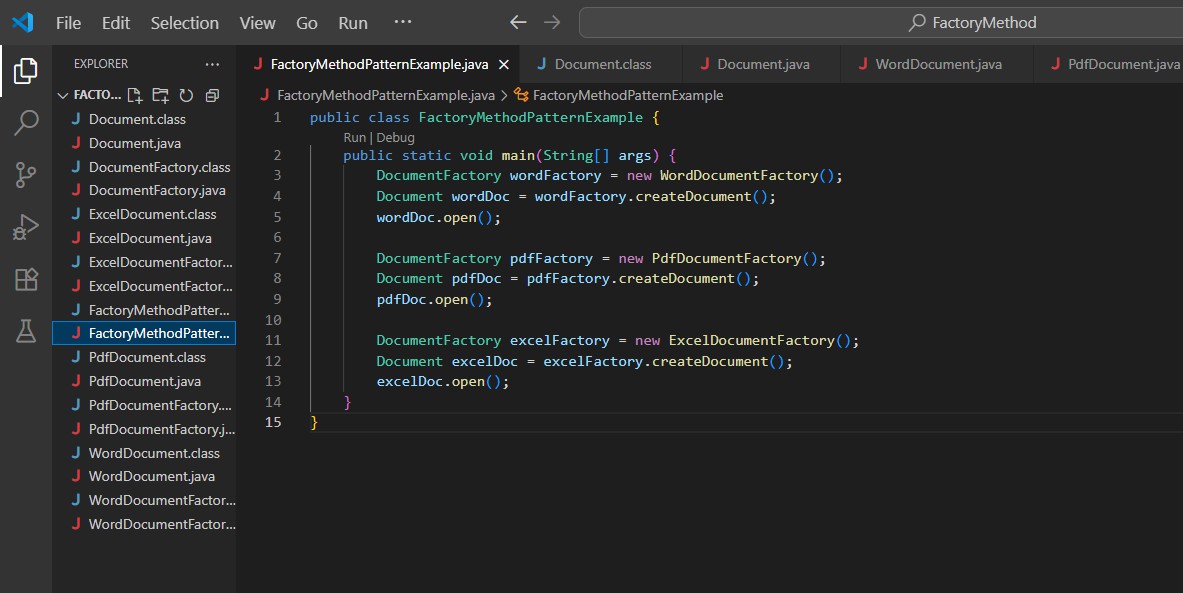
WordDocument.java



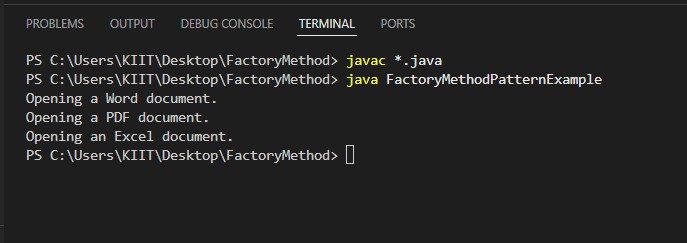
WordDocumentFactory.java



Main.java



Output



Week 1 Mandatory Hands-On

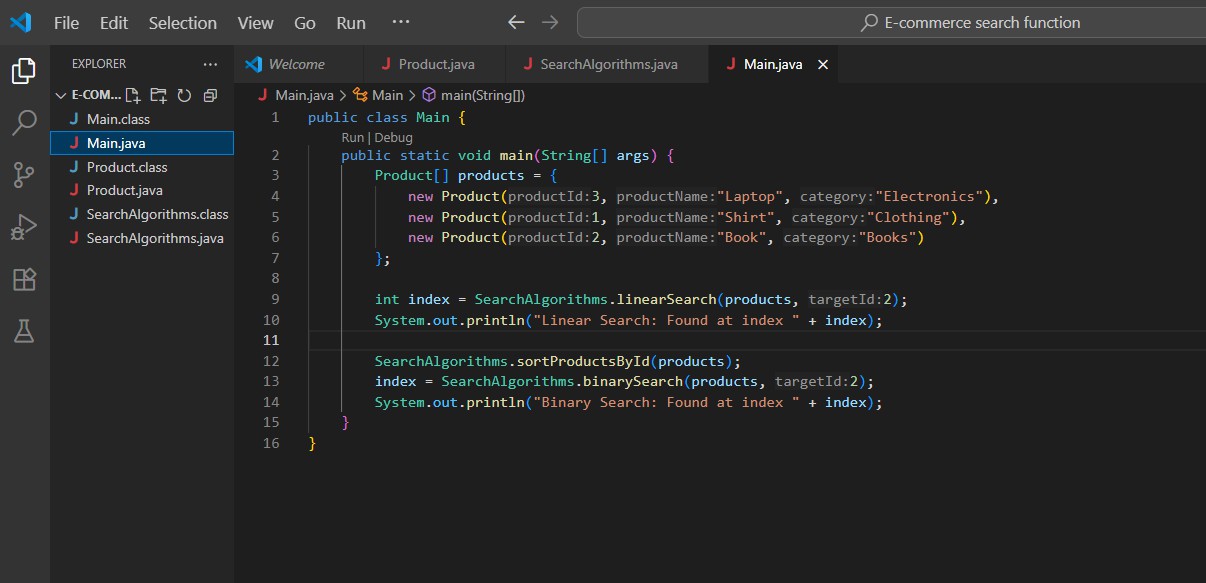
# Data structures and algorithms Exercise 2: E-commerce Platform Search Function Explanations

**Big O Notation**: Big O notation describes the upper bound of an algorithm’s running time as the input size grows. It helps us analyze and compare the efficiency of algorithms, especially for large datasets.

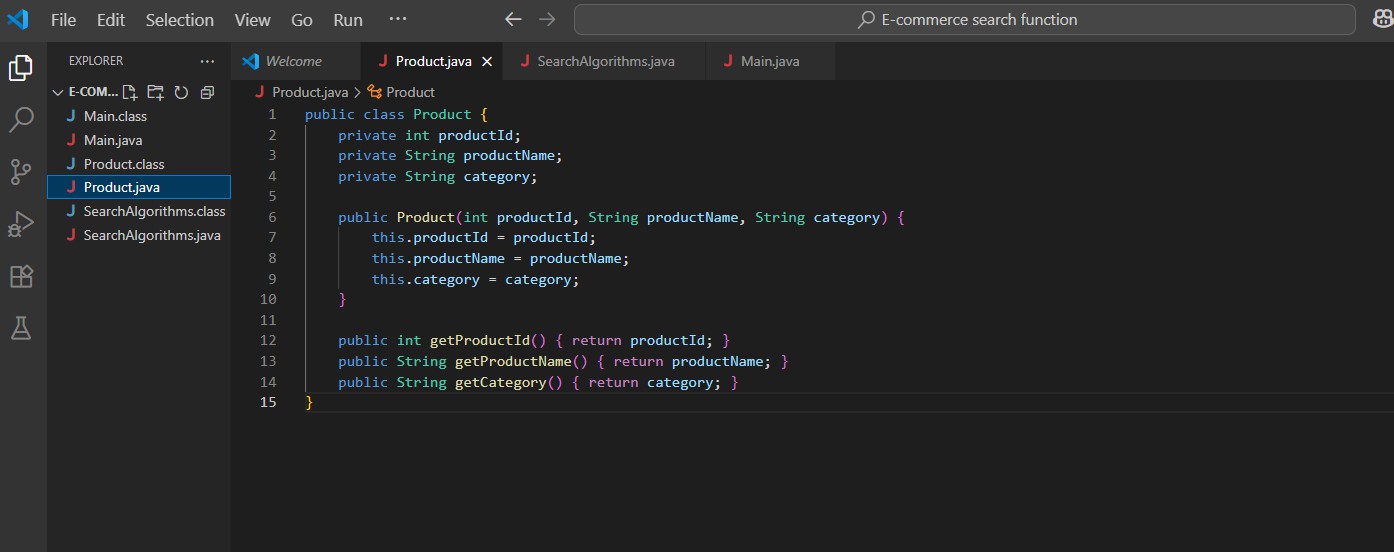
# Best, Average, and Worst-Case Scenarios

* Best Case: The minimum time an algorithm takes (e.g finding the item at the first position).
* Average Case: The expected time for a random input.
* Worst Case: The maximum time an algorithm takes (e.g item not found or at the last position).

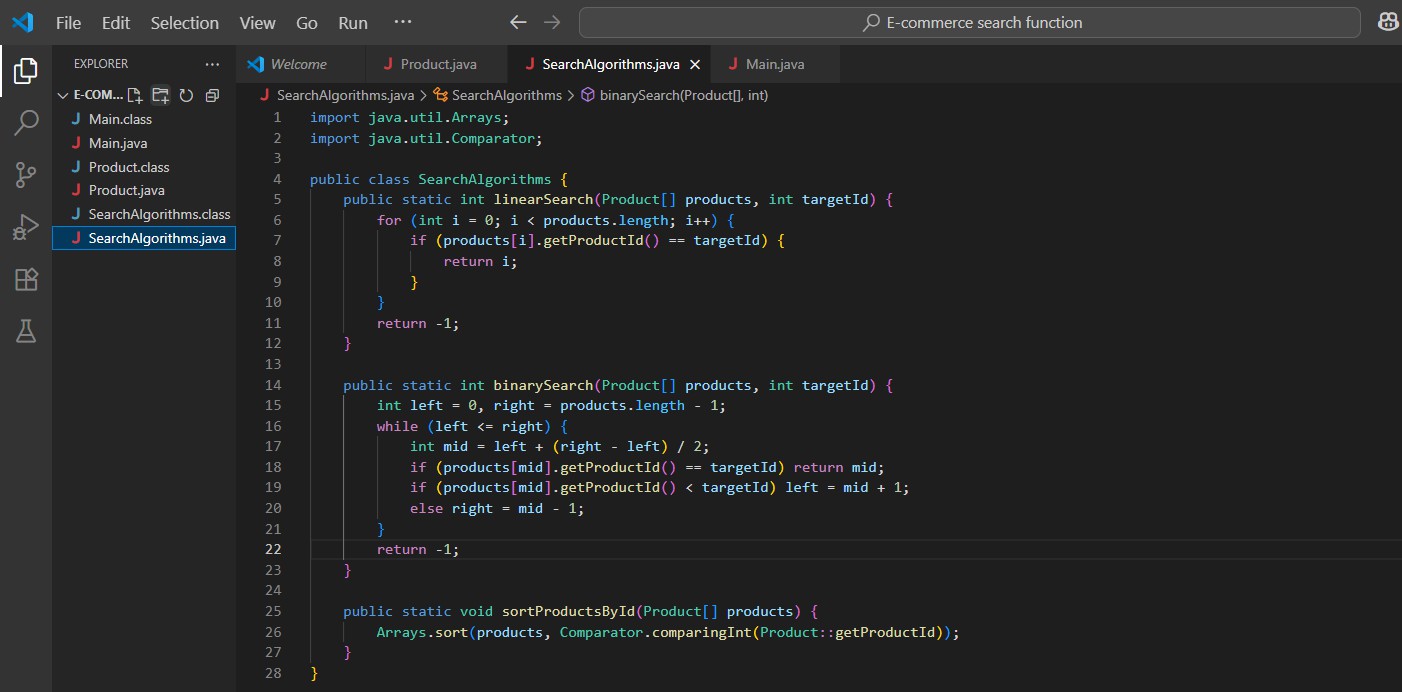
Main.java



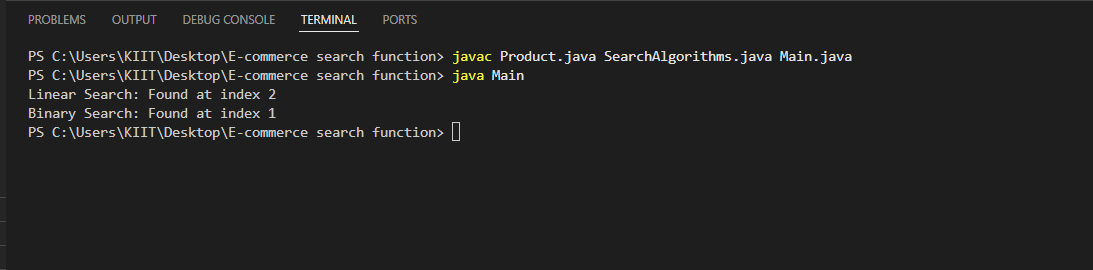
Product.java



SearchAlgorithms.java



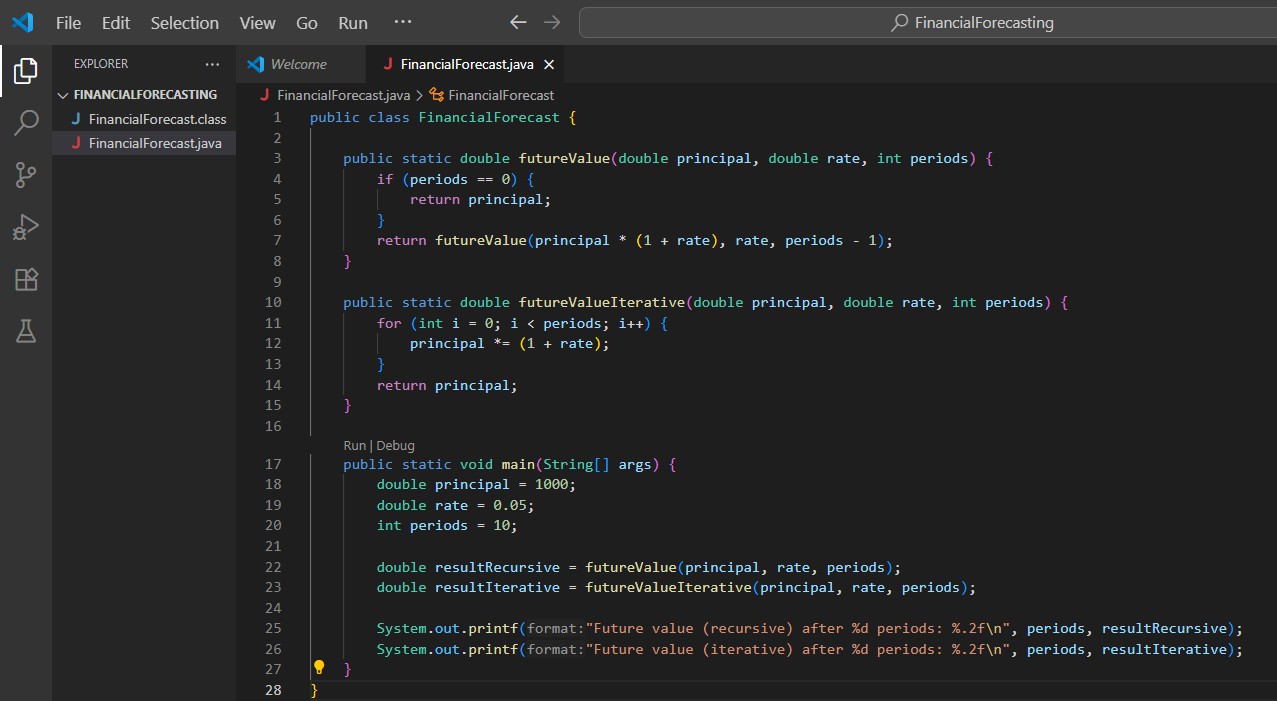
Output



# Exercise 7: Financial Forecasting

**Recursive Algorithms**: Recursion is when a function calls itself to solve smaller instances of a problem. It simplifies problems that can be broken into similar subproblems like calculating future values over time.

FinancialForecast.java



Output

