AI Assisted Coding

ASSIGNMENT 2.3

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Batch: 32

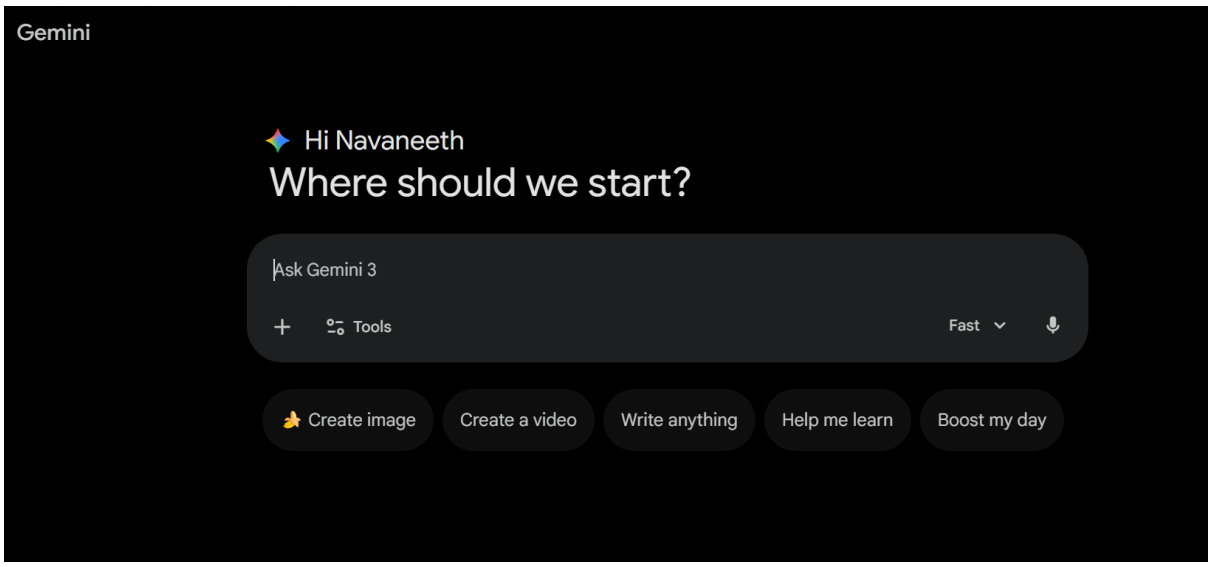
Question:

Task 1:

Word Frequency from Text File

Scenario: You are analyzing log files for keyword frequency.

Task: Use Gemini to generate java code that reads a text file and counts word frequency, then explains the code



Prompt :

Task 1:

Word Frequency from Text File

Scenario: You are analyzing log files for keyword frequency.

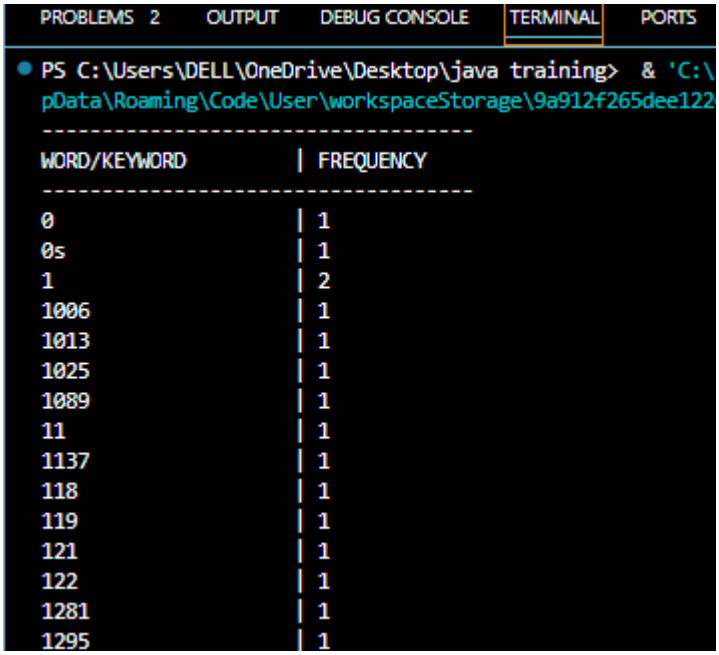
Task: Use Gemini to generate java code that reads a text file and counts word frequency,

Code

WordFrequencyCounter.java > WordFrequencyCounter

```java
import java.io.IOException;
import java.nio.charset.StandardCharsets;
import java.nio.file.Files;
import java.nio.file.Paths;
import java.util.Arrays;
import java.util.Map;
import java.util.TreeMap;
import java.util.function.Function;
import java.util.stream.Collectors;
Windsurf: Refactor | Explain
public class WordFrequencyCounter {
    Run | Debug | Windsurf: Refactor | Explain | Generate Javadoc |
    public static void main(String[] args) {
        // Your specific Windows file path
        String filePath = "C:\\Users\\DELL\\OneDrive\\Desktop\\java training\\SRU JAVA B1.txt";

        try {
            // 1. Read all lines from the file
            // 2. Convert to lowercase
            // 3. Split into words using regex (\\W+ matches any non-word character)
            // 4. Count the occurrences of each word
            Map<String, Long> wordCounts = Files.lines(Paths.get(filePath), StandardCharsets.UTF_8)
                .flatMap(line -> Arrays.stream(line.toLowerCase().split(regex: "\\W+")))
                .filter(word -> !word.isEmpty())
                .collect(Collectors.groupingBy(
                    Function.identity(),
                    TreeMap::new, // This sorts the words alphabetically
                    Collectors.counting()
                ));

            // Display the results
            System.out.println(x: "----------------------------------");
            System.out.printf(format: "%-20s | %s%n", ...args: "WORD/KEYWORD", "FREQUENCY");
            System.out.println(x: "----------------------------------");

            if (wordCounts.isEmpty()) {
                System.out.println(x: "No words found in the file.");
            } else {
                wordCounts.forEach((word, count) ->
                    System.out.printf(format: "%-20s | %d%n", word, count)
                );
            }
            System.out.println(x: "----------------------------------");

        } catch (IOException e) {
            System.err.println(x: "Error: Could not find or read the file.");
            System.err.println("Make sure the path is correct: " + filePath);
            e.printStackTrace();
        }
    }
}
```

Output



Explanation :

First, it opens your text file and reads it line by line. Then, it breaks every sentence into individual words while ignoring things like commas or periods. It turns everything into **lowercase** so that "Apple" and "apple" aren't counted as two different things. Each word is then tossed into a "counting bucket" (a **Map**) where it keeps track of how many times that word has appeared. Finally, it just prints out that bucket as an organized list for you to see.

Question:

Task 2:

File Operations Using Cursor AI

Scenario: You are automating basic file operations.

Task: Use Cursor AI to generate a program that:

Creates a text file

Writes sample text

Reads and displays the content

Prompt:

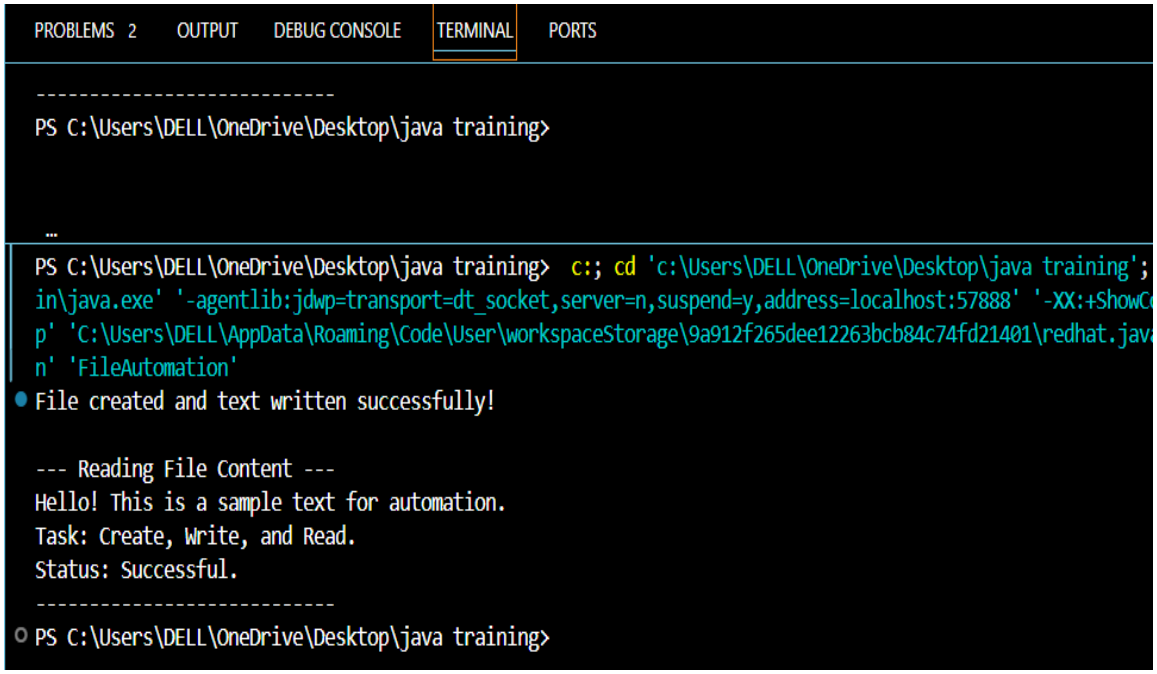
Assuming You are automating basic file operations . Your task is to
Creates a text file , Writes sample text
Reads and displays the content and print the output

Code :

FileAutomation.java > ...

```java
import java.nio.file.Files;
import java.nio.file.Path;
import java.nio.file.Paths;
import java.io.IOException;
import java.util.List;

Windsurf: Refactor | Explain
public class FileAutomation {
    Run | Debug | Windsurf: Refactor | Explain | Generate Javadoc |
    public static void main(String[] args) {
        // 1. Define the file path and name
        Path filePath = Paths.get(first: "automation_test.txt");
        String contentToWrite = "Hello! This is a sample text for automation.\n" +
                                "Task: Create, Write, and Read.\n" +
                                "Status: Successful.";

        try {
            // 2. CREATE AND WRITE: This one command creates the file or overwrites it
            Files.write(filePath, contentToWrite.getBytes());
            System.out.println(x: "File created and text written successfully!\n");

            // 3. READ AND DISPLAY: Read all lines and print them
            System.out.println(x: "--- Reading File Content ---");
            List<String> lines = Files.readAllLines(filePath);

            for (String line : lines) {
                System.out.println(line);
            }
            System.out.println(x: "----------------------------");

        } catch (IOException e) {
            System.err.println("An error occurred: " + e.getMessage());
        }
    }
}
```

Output:



Explanation :

 Setting the Path: First, we tell Java the "address" of the file we want to work with (the filename).

 Writing the File: We use a "write" command that automatically **creates** the file and pours our text inside.

 Opening the File: Next, we tell Java to go back, open that same file, and grab all the lines of text.

 The Memory List: Java saves those lines into a temporary list so the computer can remember them.

 Printing: Finally, we loop through that list and **print** each line to the screen so we can see the result.

Question:

Task 3: CSV Data Analysis

Scenario: You are processing structured data from a CSV file.

Task: Use Gemini in Colab to read a CSV file and calculate mean, min, and max.

Prompt:

Generate java code to read a CSV file and calculate the mean, minimum, and maximum values of a numeric column.

Prompt:

Generate java
code to read a CSV file and calculate the mean, minimum, and
maximum values of
a numeric column.

Code :

```java
import java.nio.file.Files;
import java.nio.file.Path;
import java.nio.file.Paths;
import java.util.DoubleSummaryStatistics;
import java.util.List;

Windsurf: Refactor | Explain
public class CSVAutoTask {
    Run | Debug | Windsurf: Refactor | Explain | Generate Javadoc | ×
    public static void main(String[] args) {
        Path filePath = Paths.get(first: "generated_scores.csv");
        // 1. CREATE: Generate the dataset inside a CSV file
        String csvData = "id,name,math_score\n" +
                         "1,Paul,73\n" +
                         "2,Danielle,90\n" +
                         "3,Tina,81\n" +
                         "4,Tara,71\n" +
                         "5,Anthony,84";
        try {
            // Write the data to a new file
            Files.write(filePath, csvData.getBytes());
            System.out.println(x: "Step 1: File 'generated_scores.csv' created successfully.");

            // 2. READ & CALCULATE: Process the math_score (Column Index 2)
            int columnId = 2;
            DoubleSummaryStatistics stats = Files.lines(filePath)
                .skip(n: 1) // Skip headers
                .map(line -> line.split(regex: ","))
                .filter(parts -> parts.length > columnId)
                .mapToDouble(parts -> Double.parseDouble(parts[columnId].trim()))
                .summaryStatistics();
            // 3. DISPLAY RESULTS
            System.out.println(x: "\nStep 2: Analysis Results from File:");
            System.out.println(x: "-----------------------------------");
            System.out.printf(format: "Average Math Score: %.2f%n", stats.getAverage());
            System.out.printf(format: "Highest Math Score: %.2f%n", stats.getMax());
            System.out.printf(format: "Lowest Math Score:  %.2f%n", stats.getMin());
            System.out.printf(format: "Total Students:     %d%n", stats.getCount());
            System.out.println(x: "-----------------------------------");
        } catch (IOException e) {
            System.err.println("Error: " + e.getMessage());
        }
    }
}
```

Output:

```
PS C:\Users\DELL\OneDrive\Desktop\java training>  c:; cd 'c:\Users\DELL\OneDrive\Desktop\java training'
ansport=dt_socket,server=n,suspend=y,address=localhost:50399' '-XX:+ShowCodeDetailsInExceptionMessages'
a912f265dee12263bcb84c74fd21401\redhat.java\jdt_ws\java training_dab59d09\bin' 'CSVAutoTask'
Step 2: Analysis Results from File:
-----------------------------------
Average Math Score: 79.80
Highest Math Score: 90.00
Lowest Math Score:  71.00
Total Students:     5
-----------------------------------
```

Explanation:

 Creating the File: We use Files.write to create a real file called generated_scores.csv and put our student data inside it.

 Opening to Read: After creating it, we use Files.lines to go back and open that same file so we can look at the numbers.

 The Header Skip: We skip the first line (id,name,math_score) because you can't do math on words.

 Picking the Column: We tell Java to look at **Index 2** (the 3rd column), which is where our scores are stored.

 Instant Math: The summaryStatistics tool scans all the numbers we just pulled out and finds the average, highest, and lowest scores for us.

Question:

Task 4: Sorting Lists Manual vs Built-in

Scenario: You are reviewing algorithm choices for efficiency.

Task: Use Gemini to generate:

Bubble sort

Python’s built-in sort()

Compare both implementations

Prompt:

Generate Bubble sort java code

Generate Bubble sort code java using Bubble sort Built in function

Code :

1. Using nested loops Bubble sort

```java
import java.util.Arrays;

Windsurf: Refactor | Explain
public class BubbleSortDemo {
    Run | Debug | Windsurf: Refactor | Explain | Generate Javadoc | ×
    public static void main(String[] args) {
        // 1. Create a sample array of numbers
        int[] numbers = {64, 34, 25, 12, 22, 11, 90};

        System.out.println("Before Sorting: " + Arrays.toString(numbers));

        // 2. The Bubble Sort Logic
        int n = numbers.length;
        for (int i = 0; i < n - 1; i++) {
            for (int j = 0; j < n - i - 1; j++) {
                // If the number on the left is bigger than the right, swap them
                if (numbers[j] > numbers[j + 1]) {
                    int temp = numbers[j];
                    numbers[j] = numbers[j + 1];
                    numbers[j + 1] = temp;
                }
            }
        }

        // 3. Display the sorted result
        System.out.println("After Sorting:  " + Arrays.toString(numbers));
    }
}
```

2. Actually, Java does **not** have a specific "built-in function" named bubbleSort(). However, Java provides a very powerful built-in tool called Arrays.sort().

The Java "Built-in" Way

BuiltInSort.java > ...

```java
import java.util.Arrays;

Windsurf: Refactor | Explain
public class BuiltInSort {
    Run | Debug | Windsurf: Refactor | Explain | Generate Javadoc | ×
    public static void main(String[] args) {
        // 1. Create your array
        int[] numbers = {64, 34, 25, 12, 22, 11, 90};

        System.out.println("Before: " + Arrays.toString(numbers));

        // 2. Use the Java Built-in sorting function
        // (This uses a high-performance algorithm behind the scenes)
        Arrays.sort(numbers);

        // 3. Show the result
        System.out.println("After:  " + Arrays.toString(numbers));
    }
}
```

Output:

```
PS C:\Users\DELL\OneDrive\Desktop\java training>  & 'C:\Program Fi
=n,suspend=y,address=localhost:50312' '-XX:+ShowCodeDetailsInExcep
orage\9a912f265dee12263bcb84c74fd21401\redhat.java\jdt_ws\java tra
Before Sorting: [64, 34, 25, 12, 22, 11, 90]
After Sorting:  [11, 12, 22, 25, 34, 64, 90]
```

```
in\java.exe' '-agentlib:jdwp=transport=dt_socket,server=n,suspend=y,a
p' 'C:\Users\DELL\AppData\Roaming\Code\User\workspaceStorage\9a912f26
n' 'BuiltInSort'
Before: [640, 354, 255, 112, 202, 111, 90]
After:  [90, 111, 112, 202, 255, 354, 640]
```

Explanation :

Bubble sort is a simple sorting algorithm that repeatedly compares and swaps adjacent elements. It is easy to understand but inefficient for large data sets.

Java sbuilt-in sort function is shorter, optimized and much faster. The built-in method should be preferred in real-world applications