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SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE	**DEPARTMENT OF COMPUTER SCIENCE ENGINEERING**

Program Name: B. Tech	**Assignment Type: Lab**	**Academic Year:**2025-2026

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CourseCode	23CS002PC304	**Course Title**	AI Assisted Coding
Year/Sem	III/II	**Regulation**	R23
Date and Day of Assignment	**Week2**	**Time(s)**	23CSBTB01 To 23CSBTB52
Duration	2 Hours	**Applicable to Batches**	All batches

Assignment Number: 3.4 (Present assignment number)/**24**(Total number of assignments)

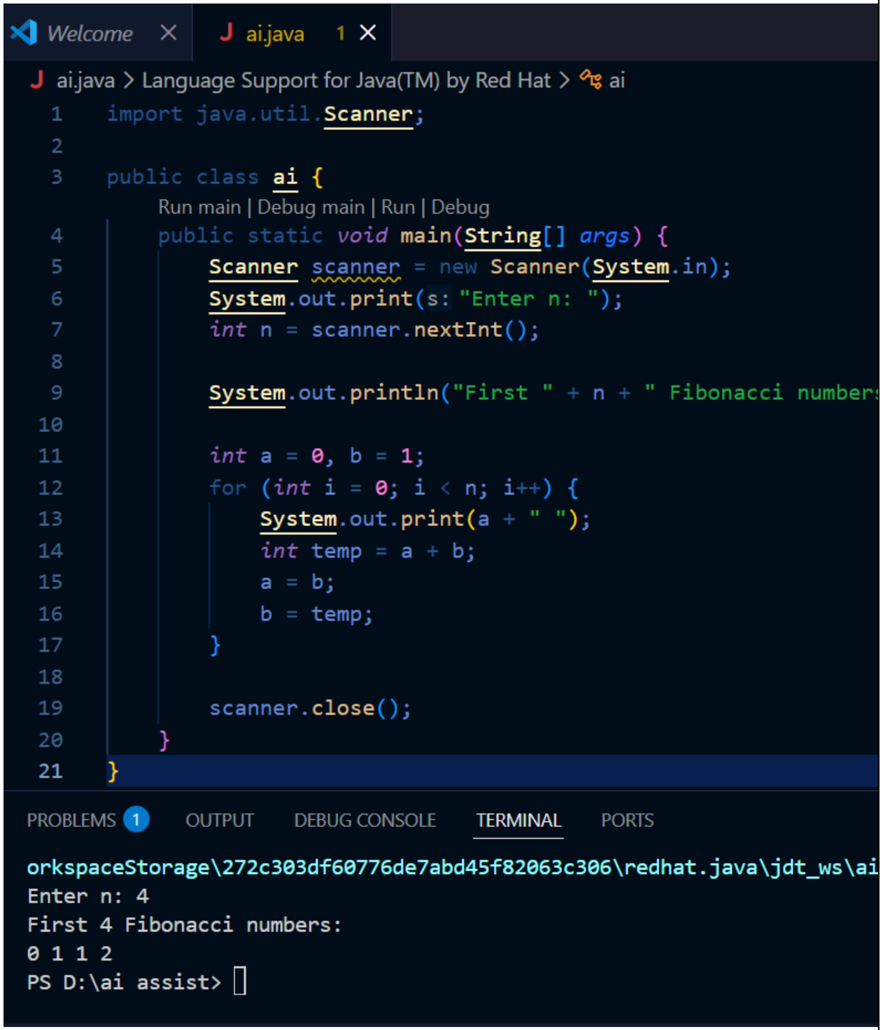
Q.No.	**Question**	***Expected Time to complete***
1	Lab 4: Advanced Prompt Engineering – Zero-shot, One-shot, and Few-shot Techniques	Week2

Task 1: Zero-shot Prompt – Fibonacci Series Generator

Task Description #1

- Without giving an example, write a single comment prompt asking GitHub Copilot to generate a Python function to print the first N Fibonacci numbers.

Expected Output #1



```java
import java.util.Scanner;

public class ai {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print(s: "Enter n: ");
        int n = scanner.nextInt();

        System.out.println("First " + n + " Fibonacci numbers

        int a = 0, b = 1;
        for (int i = 0; i < n; i++) {
            System.out.print(a + " ");
            int temp = a + b;
            a = b;
            b = temp;
        }

        scanner.close();
    }
}
```

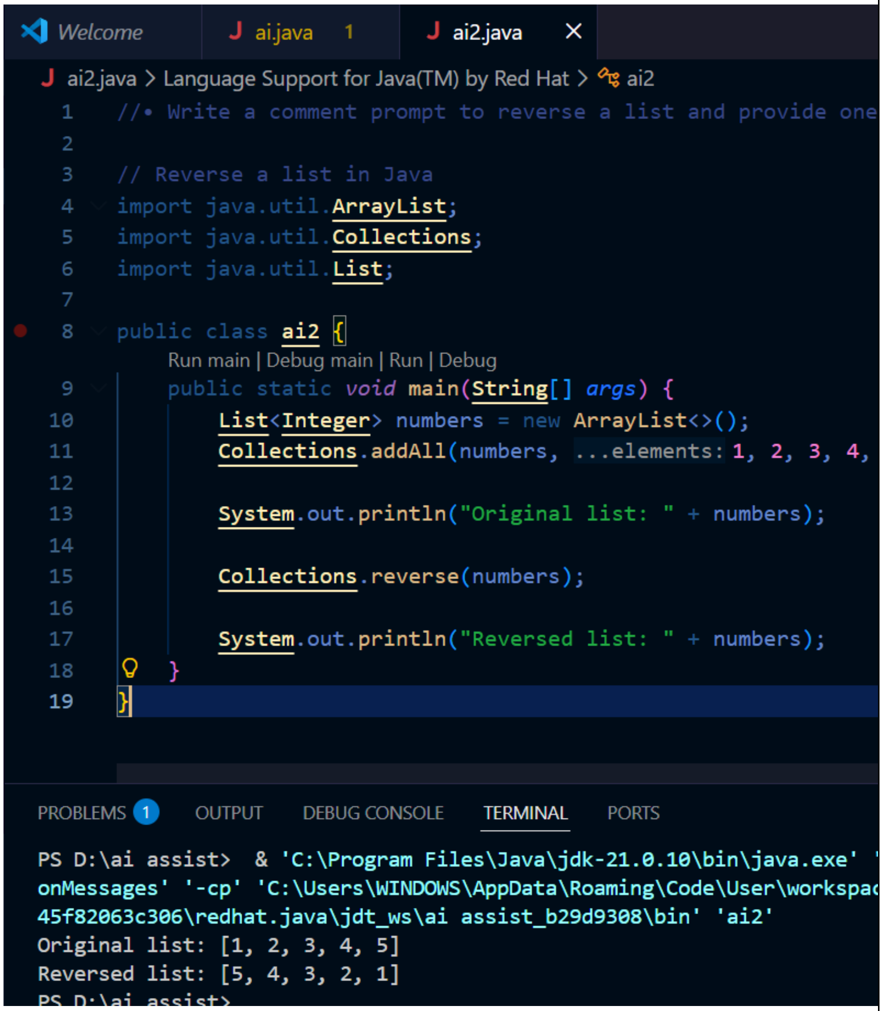
```
orkspaceStorage\272c303df60776de7abd45f82063c306\redhat.java\jdt_ws\ai
Enter n: 4
First 4 Fibonacci numbers:
0 1 1 2
PS D:\ai assist> 
```

Task 2: One-shot Prompt – List Reversal Function

Task Description #2

• Write a comment prompt to reverse a list and provide one example below the comment to guide Copilot.

Expected Output #2


Welcome
ai.java 1
ai2.java
ai2.java > Language Support for Java(TM) by Red Hat > ai2
Run main | Debug main | Run | Debug
PROBLEMS 1
OUTPUT
DEBUG CONSOLE
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```java
//• Write a comment prompt to reverse a list and provide one

// Reverse a list in Java
import java.util.ArrayList;
import java.util.Collections;
import java.util.List;

public class ai2 {
    public static void main(String[] args) {
        List<Integer> numbers = new ArrayList<>();
        Collections.addAll(numbers, ...elements: 1, 2, 3, 4,

        System.out.println("Original list: " + numbers);

        Collections.reverse(numbers);

        System.out.println("Reversed list: " + numbers);
    }
}
```

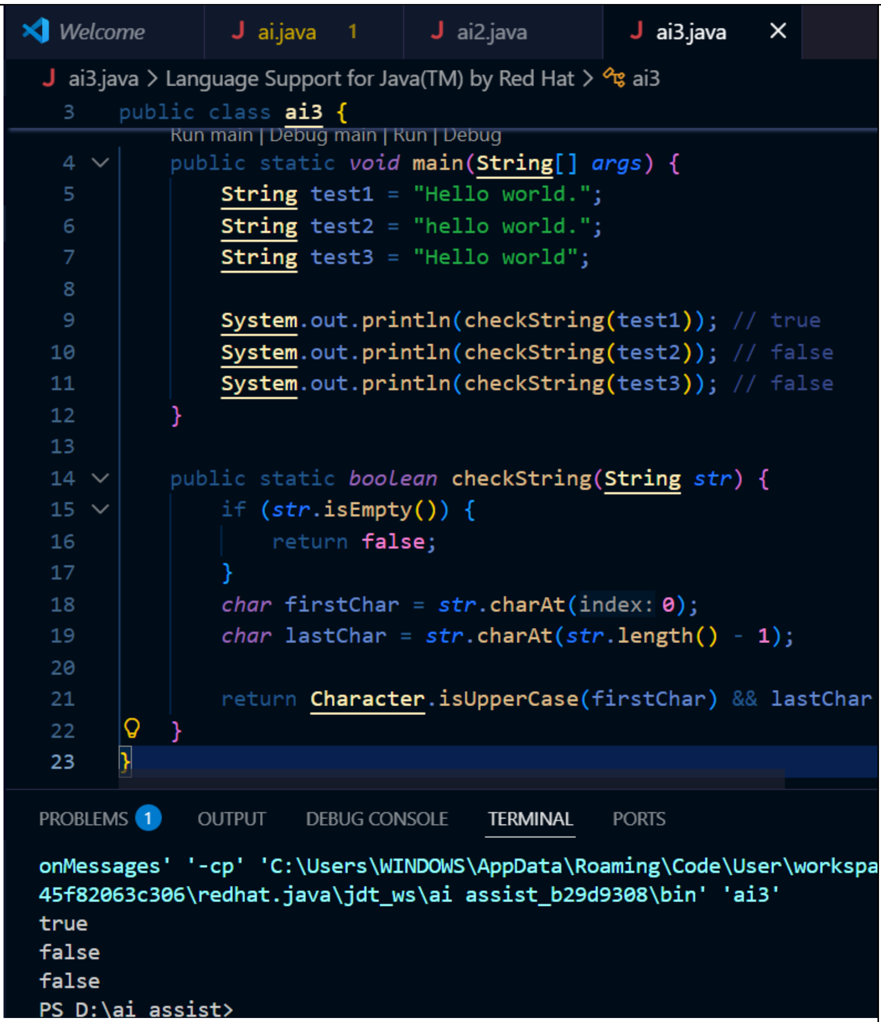
```
PS D:\ai assist>  & 'C:\Program Files\Java\jdk-21.0.10\bin\java.exe' '
onMessages' '-cp' 'C:\Users\WINDOWS\AppData\Roaming\Code\User\workspac
45f82063c306\redhat.java\jdt_ws\ai assist_b29d9308\bin' 'ai2'
Original list: [1, 2, 3, 4, 5]
Reversed list: [5, 4, 3, 2, 1]
PS D:\ai assist>
```

Task 3: Few-shot Prompt – String Pattern Matching

Task Description #3

• Write a comment with 2–3 examples to help Copilot understand how to check if a string starts with a capital letter and ends with a period.

Expected Output #3


Welcome
ai.java 1
ai2.java
ai3.java
ai3.java > Language Support for Java(TM) by Red Hat > ai3
Run main | Debug main | Run | Debug
PROBLEMS 1
OUTPUT
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TERMINAL
PORTS

```java
public class ai3 {
    public static void main(String[] args) {
        String test1 = "Hello world.";
        String test2 = "hello world.";
        String test3 = "Hello world";

        System.out.println(checkString(test1)); // true
        System.out.println(checkString(test2)); // false
        System.out.println(checkString(test3)); // false
    }

    public static boolean checkString(String str) {
        if (str.isEmpty()) {
            return false;
        }
        char firstChar = str.charAt(index: 0);
        char lastChar = str.charAt(str.length() - 1);

        return Character.isUpperCase(firstChar) && lastChar
    }
}
```

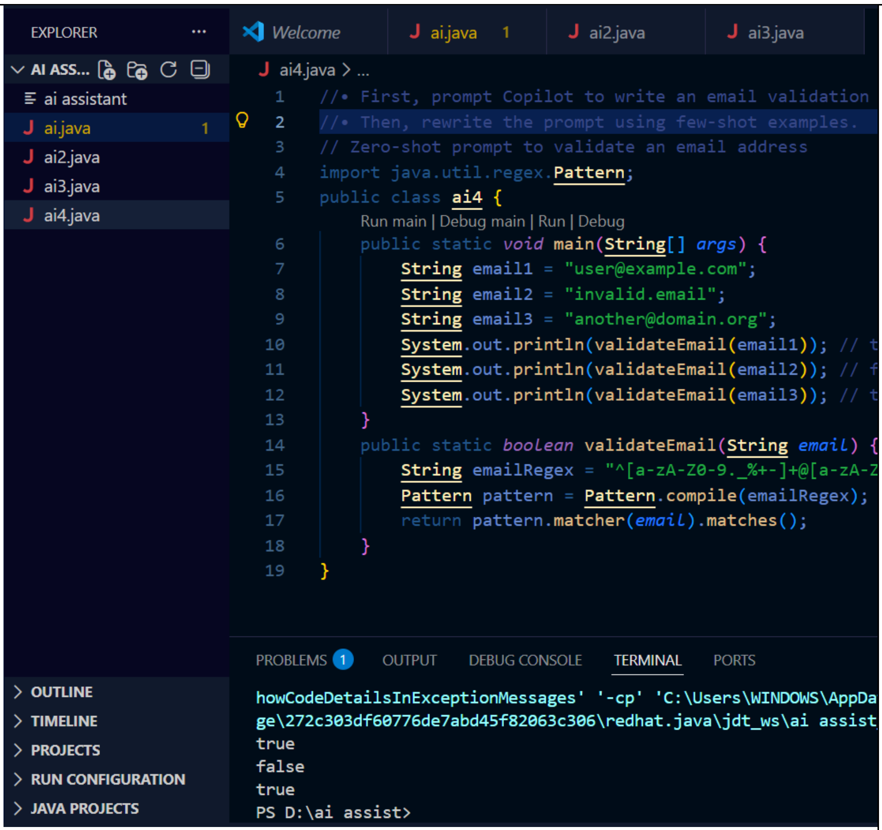
```
onMessages' '-cp' 'C:\Users\WINDOWS\AppData\Roaming\Code\User\workspa
45f82063c306\redhat.java\jdt_ws\ai assist_b29d9308\bin' 'ai3'
true
false
false
PS D:\ai assist>
```

Task 4: Zero-shot vs Few-shot – Email Validator

Task Description #4

- First, prompt Copilot to write an email validation function using zero-shot (just the task in comment).
- Then, rewrite the prompt using few-shot examples.

Expected Output #4



```java
//• First, prompt Copilot to write an email validation
//• Then, rewrite the prompt using few-shot examples.
// Zero-shot prompt to validate an email address
import java.util.regex.Pattern;
public class ai4 {
    public static void main(String[] args) {
        String email1 = "user@example.com";
        String email2 = "invalid.email";
        String email3 = "another@domain.org";
        System.out.println(validateEmail(email1)); // t
        System.out.println(validateEmail(email2)); // f
        System.out.println(validateEmail(email3)); // t
    }
    public static boolean validateEmail(String email) {
        String emailRegex = "^[a-zA-Z0-9._%+-]+@[a-zA-Z
        Pattern pattern = Pattern.compile(emailRegex);
        return pattern.matcher(email).matches();
    }
}
```

```
howCodeDetailsInExceptionMessages' '-cp' 'C:\Users\WINDOWS\AppDa
ge\272c303df60776de7abd45f82063c306\redhat.java\jdt_ws\ai assist
true
false
true
PS D:\ai assist>
```

Task 5: Prompt Tuning – Summing Digits of a Number

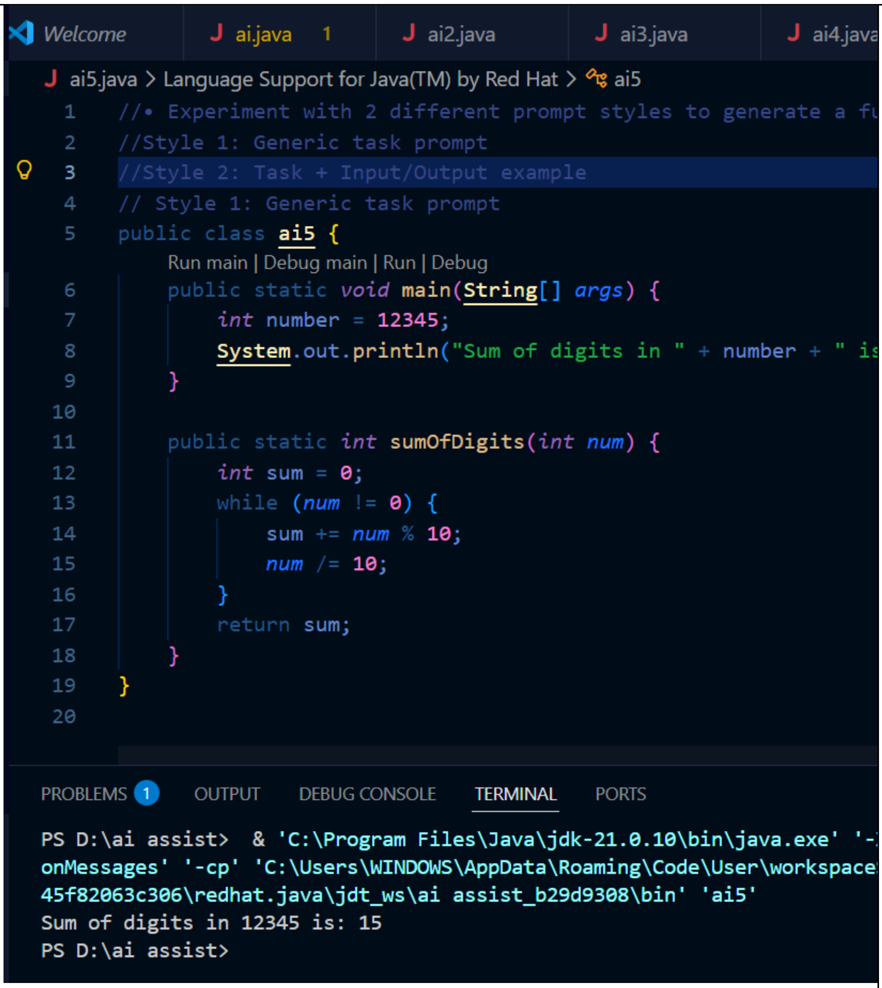
Task Description #5

- Experiment with 2 different prompt styles to generate a function that returns the sum of digits of a number.

Style 1: Generic task prompt

Style 2: Task + Input/Output example

Expected Output #5


Welcome
ai.java 1
ai2.java
ai3.java
ai4.java
ai5.java > Language Support for Java(TM) by Red Hat > ai5
Run main | Debug main | Run | Debug
PROBLEMS 1
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS

```java
//• Experiment with 2 different prompt styles to generate a fu
//Style 1: Generic task prompt
//Style 2: Task + Input/Output example
// Style 1: Generic task prompt
public class ai5 {
    public static void main(String[] args) {
        int number = 12345;
        System.out.println("Sum of digits in " + number + " is
    }

    public static int sumOfDigits(int num) {
        int sum = 0;
        while (num != 0) {
            sum += num % 10;
            num /= 10;
        }
        return sum;
    }
}

```

```
PS D:\ai assist>  & 'C:\Program Files\Java\jdk-21.0.10\bin\java.exe' '-
onMessages' '-cp' 'C:\Users\WINDOWS\AppData\Roaming\Code\User\workspace
45f82063c306\redhat.java\jdt_ws\ai assist_b29d9308\bin' 'ai5'
Sum of digits in 12345 is: 15
PS D:\ai assist>
```

Note: Report should be submitted a word document for all tasks in a single document with prompts, comments & code explanation, and output and if required, screenshots