Day 20:

Task 1: Java IO Basics

Write a program that reads a text file and counts the frequency of each word using FileReader and FileWriter.

```
package com.assig.day20;
import java.io.*; import
java.util.*;


public class WordFrequencyCounter {


    public static void main(String[] args) { String
        inputFilePath = "input.txt"; String
        outputFilePath = "output.txt";


        // Read the text file and count word frequencies Map<String,

        Integer> wordCountMap =
readFileAndCountWords(inputFilePath);


        // Write the word frequencies to the output file
        writeWordFrequenciesToFile(wordCountMap, outputFilePath);
    }
```

```
    private static Map<String, Integer> readFileAndCountWords(String filePath) {
        Map<String, Integer> wordCountMap = new HashMap<>();

        try (FileReader fr = new FileReader(filePath); BufferedReader
            br = new BufferedReader(fr)) { String line;
            while ((line = br.readLine()) != null) {
                String[] words = line.split("\\W+"); for
                (String word : words) {
                    if (!word.isEmpty()) {
                        word = word.toLowerCase();
                        wordCountMap.put(word,
wordCountMap.getOrDefault(word, 0) + 1);
                    }
                }
            }
        } catch (IOException e) {
            System.err.println("Error reading file: " + e.getMessage());
        }

        return wordCountMap;
    }
```

```
    private static void writeWordFrequenciesToFile(Map<String, Integer>
wordCountMap, String filePath) {
        try (FileWriter fw = new FileWriter(filePath);
             BufferedWriter bw = new BufferedWriter(fw)) { for
            (Map.Entry<String, Integer> entry :
wordCountMap.entrySet()) {
                bw.write(entry.getKey() + ": " + entry.getValue()); bw.newLine();
            }
        } catch (IOException e) {
            System.err.println("Error writing to file: " + e.getMessage());
        }
    }
}
```

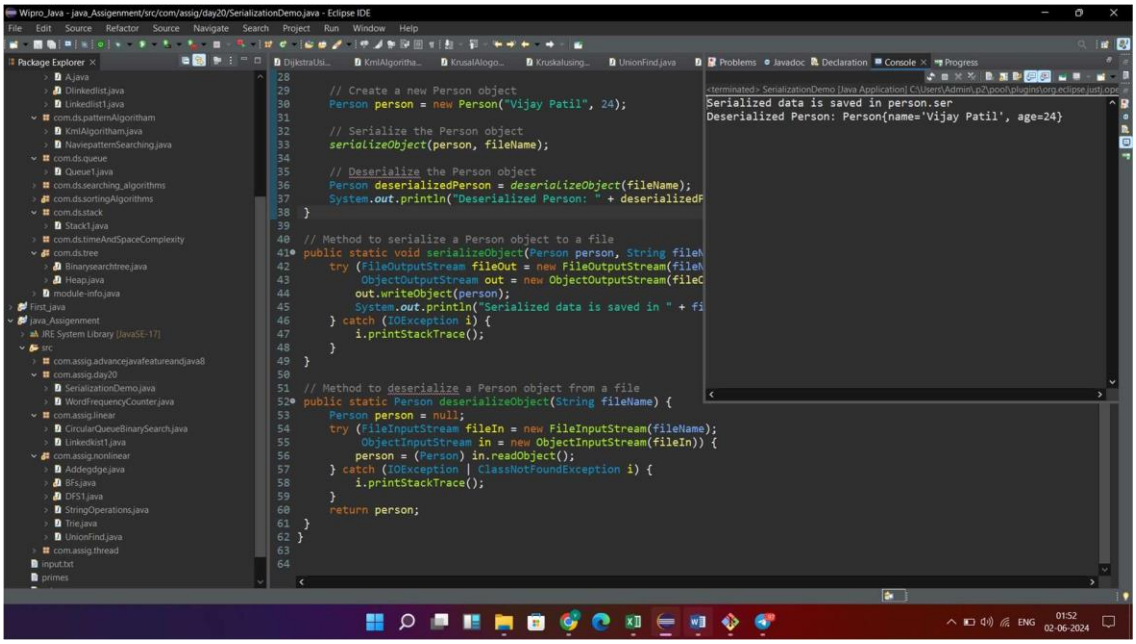
Task 2: Serialization and Deserialization

Serialize a custom object to a file and then deserialize it back to recover the object state

```
import java.io.*;

class Person implements Serializable {
    private String name;
    private int age;

    public Person(String name, int age) {
        this.name = name;
        this.age = age;
    }

    @Override
```

```
    public String toString() {
        return "Person{name='" + name + "', age=" + age + "}";
    }
}

public class SerializationDemo {

    public static void main(String[] args) {
        String fileName = "person.ser";

        // Create a new Person object
        Person person = new Person("Vijay Patil", 24);

        // Serialize the Person object
        serializeObject(person, fileName);

        // Deserialize the Person object
        Person deserializedPerson = deserializeObject(fileName);
        System.out.println("Deserialized Person: " + deserializedPerson);
    }

    // Method to serialize a Person object to a file
    public static void serializeObject(Person person, String fileName) {
        try (ObjectOutputStream out = new ObjectOutputStream(new
FileOutputStream(fileName))) {
            out.writeObject(person);
            System.out.println("Serialization complete.");
        } catch (IOException e) {
            e.printStackTrace();
        }
```

```
    }


    // Method to deserialize a Person object from a file
    public static Person deserializeObject(String fileName) {
        try (ObjectInputStream in = new ObjectInputStream(new
FileInputStream(fileName))) {
            return (Person) in.readObject();
        } catch (IOException | ClassNotFoundException e) {
            e.printStackTrace();
            return null;
        }
    }
}
```



Task 3: New IO (NIO)

Use NIO Channels and Buffers to read content from a file and write to another file.

package com.wipro; import

java.io.IOException; import

java.nio.file.Files; import

java.nio.file.Path; import

java.nio.file.Paths;

import java.nio.file.StandardOpenOption; import

java.util.Iterator;

import java.util.List;

```
public class Mynio {
        String fileName = "mydir/rhymes.txt"; public
        void createDirectory() {
                Path p = Paths.get("mydir"); try {
                        if (Files.exists(p)) {
                                System.out.println("Directory already exists");
                        } else {
                                Path cPath = Files.createDirectories(p);
                                System.out.println("Directory created at " +
    cPath.toString());
                        }
                } catch (Exception e) {
                        e.printStackTrace();
                }
        }
        public void createFile(String fileName) { Path f =
                Paths.get(fileName);
                try {
                        if (Files.exists(f)) {
                                System.out.println("File already exists");
                        } else {
                                Path cFile = Files.createFile(f);
```

```
                        System.out.println("Directory created at " +
cFile.toString());
                    }
                } catch (Exception e) {
                    e.printStackTrace();
                }
            }
            public void readFile() {
                Path f = Paths.get(fileName); try {
                    List<String> data = Files.readAllLines(f); for
                    (String str : data) {
                        System.out.println(str);
                    }
                } catch (Exception e) {
                    e.printStackTrace();
                }

            }
            public void writeFile(String fileName) { Path f =
                Paths.get(fileName);
                try {
                    String content = " Johny Johny , Yes Papa,\n Eating sugar
? No Papa";
```

```
                Files.write(f, content.getBytes()); System.out.println("Data
                Written Successfully");
            } catch (IOException e) {
                // TODO Auto-generated catch block e.printStackTrace();
            }
        }

        public void appendFile(String fileName) { Path f
            = Paths.get(fileName);
            try {
                String content = "\n Telling Lies ? No Papa,\n Open your
Mouth, Ha Ha Ha :)";
                Files.write(f, content.getBytes(),
StandardOpenOption.APPEND);
                System.out.println("Data Appended Successfully");
            } catch (IOException e) {
                // TODO Auto-generated catch block e.printStackTrace();
            }
        }

        public static void main(String[] args) { Mynio mn
            = new Mynio();
```

```
        // Create a directory
        mn.createDirectory();

        // Create a file mn.createFile("mydir/rhymes.txt");

        // Read from file mn.readFile();
        // Write to a file
        mn.writeFile(mn.fileName);

        // Read from file mn.readFile();

        // Append to a file
        mn.appendFile(mn.fileName);
        // Read from file mn.readFile();
    }

}
```

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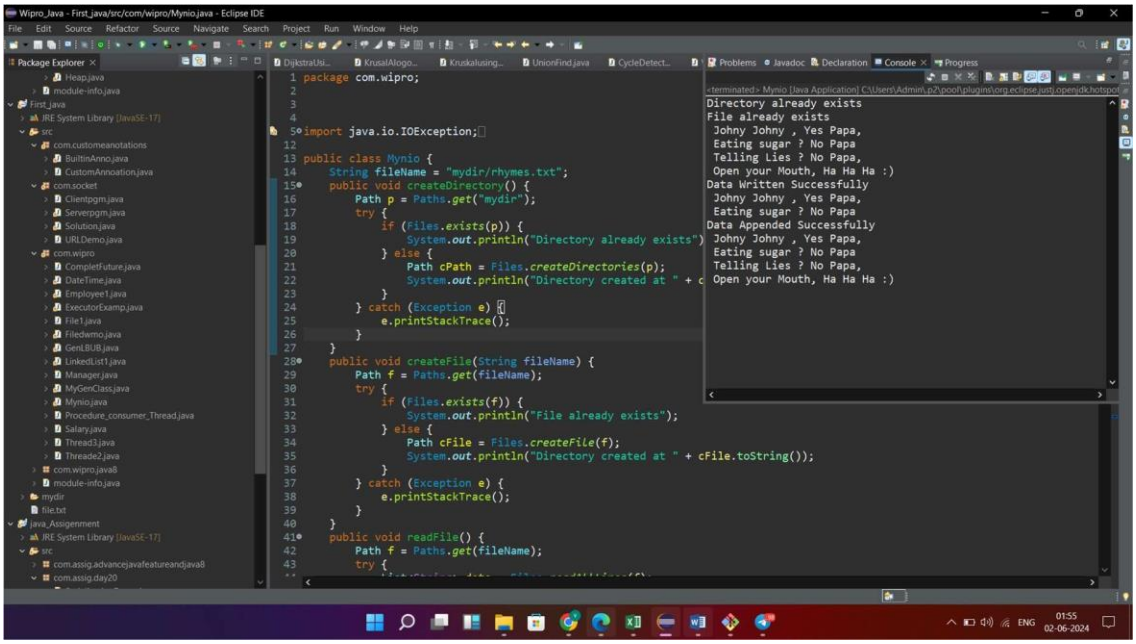

Task 4: Java Networking

Write a simple HTTP client that connects to a URL, sends a request, and displays the response headers and body.

```
package com.socket;


import java.io.BufferedReader; import
java.io.IOException;
import java.io.InputStreamReader; import
java.net.MalformedURLException; import
java.net.URL;
import java.net.URLConnection; public


class URLDemo {
```

```
public static void main(String[] args) { try {
        URL url = new URL("http://www.example.com");

        URLConnection urlcon = url.openConnection(); BufferedReader

        br  = new BufferedReader(new
InputStreamReader(urlcon.getInputStream()));

        String line;
        while((line = br.readLine()) != null) {
            System.out.println(line);
        }
        br.close();

    } catch (MalformedURLException e) {

        e.printStackTrace();
    } catch (IOException e) {

        e.printStackTrace();
    }
```

```
        }

}
```

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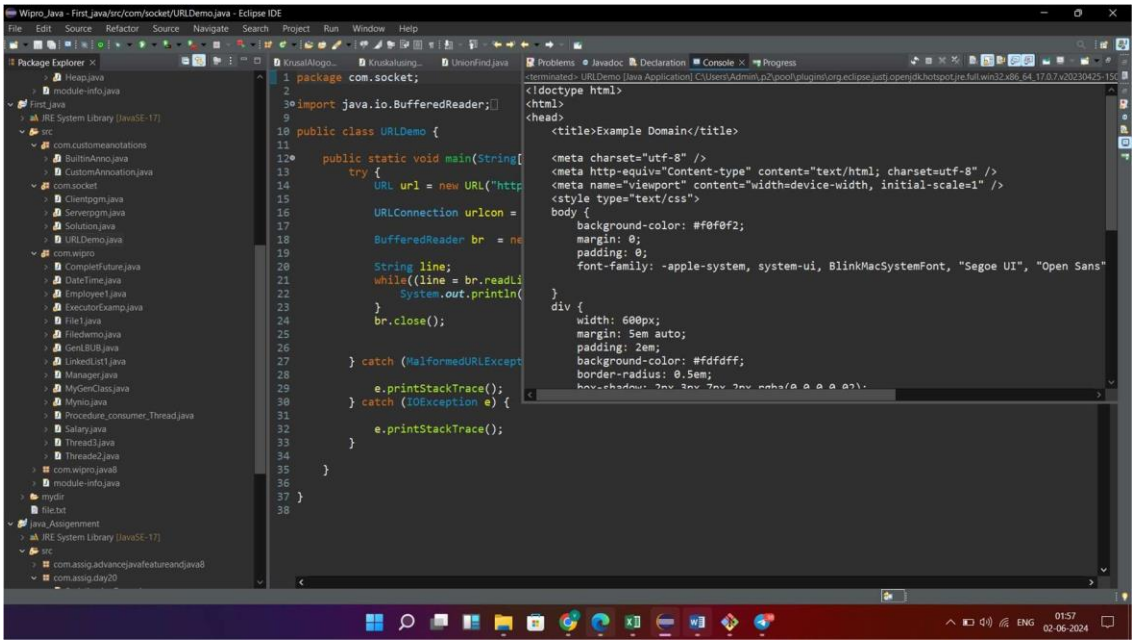

Task 5: Java Networking and Serialization

Develop a basic TCP client and server application where the client sends a serialized object with 2 numbers and operation to be performed on them to the server, and the server computes the result and sends it back to the client. for eg, we could send 2, 2, "+" which would mean 2 + 2

Operationrequest:

```
package clinentserverapplication;


import java.io.Serializable;


public class OperationRequest implements Serializable {
    private static final long serialVersionUID = 1L;
    private double number1;
    private double number2;
    private String operation;
```

```
    public OperationRequest(double number1, double number2, String operation) {
        this.number1 = number1;
        this.number2 = number2;
        this.operation = operation;
    }

    public double getNumber1() {
        return number1;
    }

    public double getNumber2() {
        return number2;
    }

    public String getOperation() {
        return operation;
    }
}
```

Opretation server:;

```
package clinentserverapplication;


import java.io.*; import
java.net.*;


public class OperationServer {
    public static void main(String[] args) { int
        port = 12345;


        try (ServerSocket serverSocket = new ServerSocket(port)) {
            System.out.println("Server is listening on port " + port);
```

```
        while (true) {
            try (Socket socket = serverSocket.accept(); ObjectInputStream ois =
                    new
ObjectInputStream(socket.getInputStream());
                    ObjectOutputStream oos = new
ObjectOutputStream(socket.getOutputStream())) {

                OperationRequest request = (OperationRequest) ois.readObject();
                double result = performOperation(request);

                oos.writeObject(result); oos.flush();
            } catch (IOException | ClassNotFoundException ex) {
                ex.printStackTrace();
            }
        }
    } catch (IOException ex) {
        ex.printStackTrace();
    }
}

private static double performOperation(OperationRequest request) {
    double number1 = request.getNumber1();
```

```
        double number2 = request.getNumber2(); String
        operation = request.getOperation();


        switch (operation) { case
            "+":
                return number1 + number2; case "-":
                return number1 - number2; case "*":
                return number1 * number2; case "/":
                if (number2 != 0) {
                    return number1 / number2;
                } else {
                    throw new IllegalArgumentException("Division by zero");
                }
            default:
                throw new UnsupportedOperationException("Unsupported operation: " +
operation);
        }
    }
}
```

Operation client:

```
package clinentserverapplication;
```

```
import java.io.*; import
java.net.*;

public class OperationClient {
    public static void main(String[] args) { String
        host = "localhost";
        int port = 12345;


        try (Socket socket = new Socket(host, port); ObjectOutputStream oos =
            new
ObjectOutputStream(socket.getOutputStream());
            ObjectInputStream ois = new
ObjectInputStream(socket.getInputStream())) {

            OperationRequest request = new OperationRequest(2, 2, "+");
            oos.writeObject(request);
            oos.flush();

            double result = (double) ois.readObject(); System.out.println("Result: " +
            result);

        } catch (IOException | ClassNotFoundException ex) { ex.printStackTrace();
```

```
        }
    }
}
```

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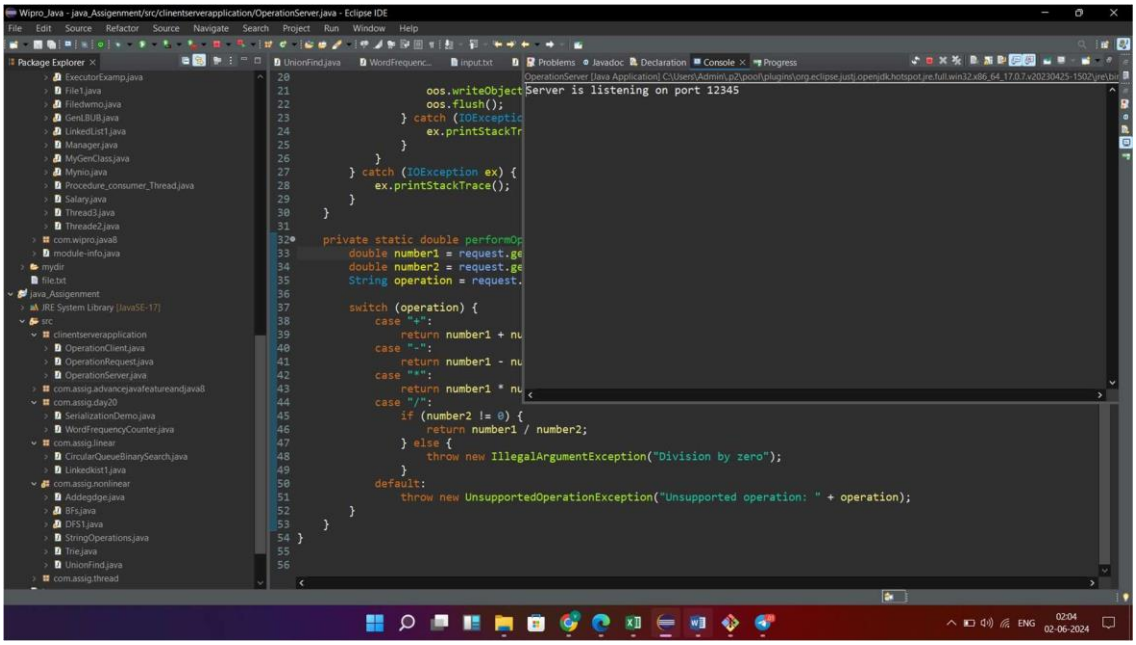
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Problems
Javadoc
Declaration
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Progress
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ExecutorExamp.java
File1.java
Filedwmo.java
GenLBUB.java
LinkedList1.java
Manager.java
MyGenClass.java
Mymio.java
Procedure_consumer_Thread.java
Salary.java
Thread3.java
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module-info.java
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file.txt
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clinentserverapplication
OperationClient.java
OperationRequest.java
OperationServer.java
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SerializationDemo.java
WordFrequencyCounter.java
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CircularQueueBinarySearch.java
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DFS1.java
StringOperations.java
Trie.java
UnionFind.java
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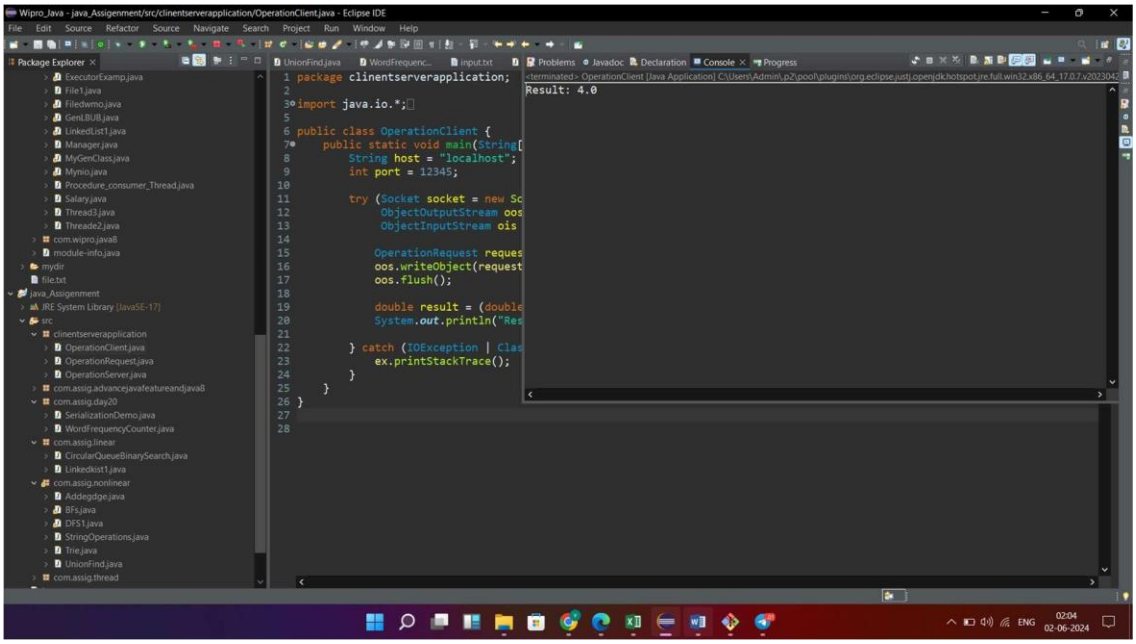


Task 6: Java 8 Date and Time API

Write a program that calculates the number of days between two dates input by the user.

```
package com.assig.day20;


import java.time.LocalDate;

import java.time.format.DateTimeFormatter; import

java.time.temporal.ChronoUnit; import

java.util.Scanner;


public class DateDifferenceCalculator { public


    static void main(String[] args) {
```

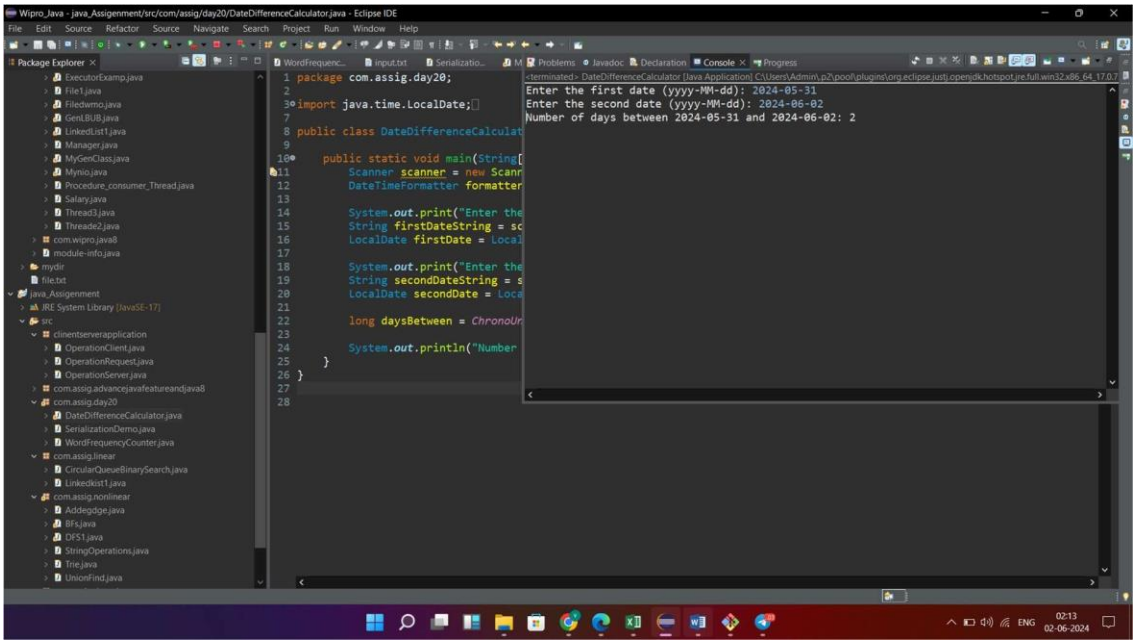
```
        Scanner scanner = new Scanner(System.in);
        DateTimeFormatter formatter =
DateTimeFormatter.ofPattern("yyyy-MM-dd");

        System.out.print("Enter the first date (yyyy-MM-dd): "); String
        firstDateString = scanner.nextLine();
        LocalDate firstDate = LocalDate.parse(firstDateString, formatter);

        System.out.print("Enter the second date (yyyy-MM-dd): "); String
        secondDateString = scanner.nextLine();
        LocalDate secondDate = LocalDate.parse(secondDateString, formatter);

        long daysBetween = ChronoUnit.DAYS.between(firstDate, secondDate);

        System.out.println("Number of days between " + firstDate + " and " +
secondDate + ": " + daysBetween);
    }
}
```



Task 7: Timezone

Create a timezone converter that takes a time in one timezone and converts it to another timezone

```
package com.wipro;


import java.time.LocalDate; import
java.time.LocalDateTime; import
java.time.LocalTime; import
java.time.Month;
import java.time.Period; import
java.time.Year;
import   java.time.format.DateTimeFormatter;   import
java.time.temporal.TemporalAdjuster;              import
java.time.temporal.TemporalAdjusters;
```

```
import java.util.Calendar;
import java.util.TimeZone;

public class DateTime {

	public static void main(String[] args) {
		// TODO Auto-generated method stub
		LocalDate localdate =LocalDate.now();
		System.out.println(localdate);

LocalDate cdate=LocalDate.of(2024, Month.MAY, 21); System.out.println(cdate);
LocalTime tt= LocalTime.now();
System.out.println(tt);

LocalDateTime lt= LocalDateTime.now();
System.out.println(lt);
TimeZone zone = TimeZone.getTimeZone("Asia/Kolkata"); System.out.println("The
Offset value of TimeZone: " + zone.getOffset(Calendar.ZONE_OFFSET));

	Period p=Period.between(localdate, cdate);
	System.out.println(p);
```

```
        DateTimeFormatter formatter = DateTimeFormatter.ofPattern("HH:mm:ss");
        String formattedTime = tt.format(formatter); System.out.println(formattedTime);


        DateTimeFormatter formatter1 = DateTimeFormatter.ofPattern("dd/MM/yyyy
HH:mm:ss");
        String formattedDateTime = lt.format(formatter1);
        System.out.println(formattedDateTime);


        int year=2024;
        System.out.println(Year.isLeap(year));


        //TemporalAdjuster class in java

        System.out.println("first day of
month"+cdate.with(TemporalAdjusters.firstDayOfMonth()));
        System.out.println("first day of next
month"+cdate.with(TemporalAdjusters.firstDayOfNextMonth()));


        System.out.println("first day of next
year"+cdate.with(TemporalAdjusters.firstDayOfNextYear()));



         }
```

```
//        public static void checkdade(LocalDate id)
//        {
//
//                LocalDate today=LocalDate.now();
//                if()
//                System.out.println(id + "is before today");
//        }



}
```

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