Day 20

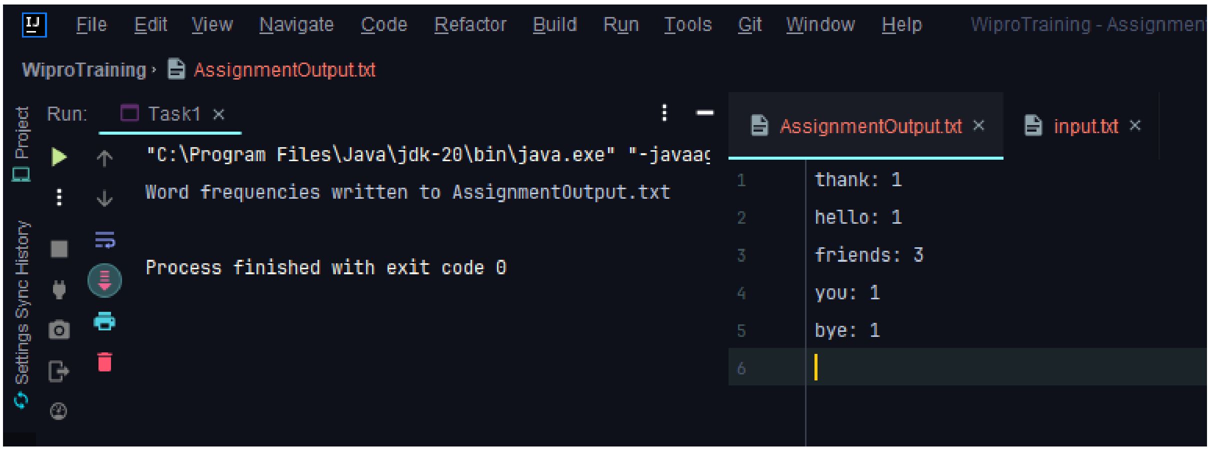
Task 1: Java IO Basics

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

Program:

```
package Assignments.Day20;

import java.io.*;
import java.util.*;

public class Task1 {
    public static void main(String[] args) {
        String inputFilePath = "input.txt"; // input text file
        String outputFilePath = "AssignmentOutput.txt"; // output file

        try (BufferedReader reader = new BufferedReader(new
FileReader(inputFilePath));
             BufferedWriter writer = new BufferedWriter(new
FileWriter(outputFilePath))) {

            Map<String, Integer> wordFrequencyMap = new HashMap<>();

            String line;
            while ((line = reader.readLine()) != null) {
                String[] words = line.split("\\s+"); // Split by whitespace
                for (String word : words) {
                    word = word.toLowerCase(); // Convert to lowercase
                    wordFrequencyMap.put(word, wordFrequencyMap.getOrDefault(word,
0) + 1);
                }
            }

            for (Map.Entry<String, Integer> entry : wordFrequencyMap.entrySet()) {
                writer.write(entry.getKey() + ": " + entry.getValue());
                writer.newLine();
            }

            System.out.println("Word frequencies written to " + outputFilePath);
        } catch (IOException e) {
            e.printStackTrace();
        }
    }
}
```

Output:



```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaag
Word frequencies written to AssignmentOutput.txt

Process finished with exit code 0
```

```
thank: 1
hello: 1
friends: 3
you: 1
bye: 1
```

Task 2: Serialization and Deserialization

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

Program

Step 1: Create a class called Employee

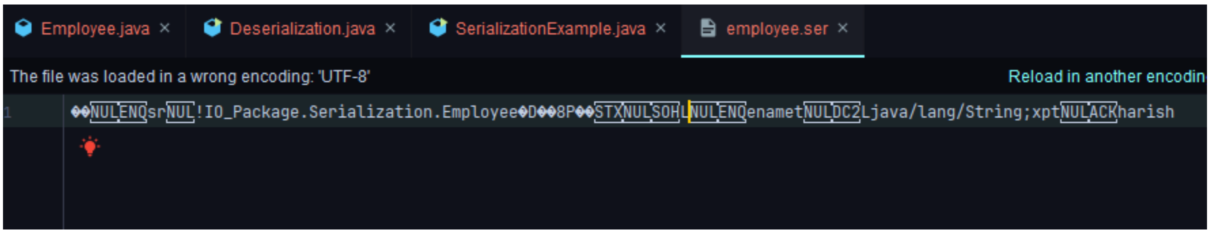
```java
package IO_Package.Serialization;

import java.io.Serializable;

public class Employee implements Serializable {
    transient private int eid;
    private String ename;
    public  Employee(int eid, String ename){
        this.eid = eid;
        this.ename = ename;
    }

    @Override
    public String toString() {
        return "EName = "+this.ename+" EID = "+this.eid;
    }
}
```

Step 2: Create a new class called Serialization which create a “employee.ser” file.

```java
package IO_Package.Serialization;


import java.io.FileOutputStream;
import java.io.IOException;
import java.io.ObjectOutputStream;

public class SerializationExample {
    public static void main(String[] args) throws IOException {
        Employee emp = new Employee(101,"harish");
        ObjectOutputStream oos = new ObjectOutputStream(new
FileOutputStream("employee.ser"));
        oos.writeObject(emp);
        System.out.println("Employee is Serialized");
```

```
    }
}
```

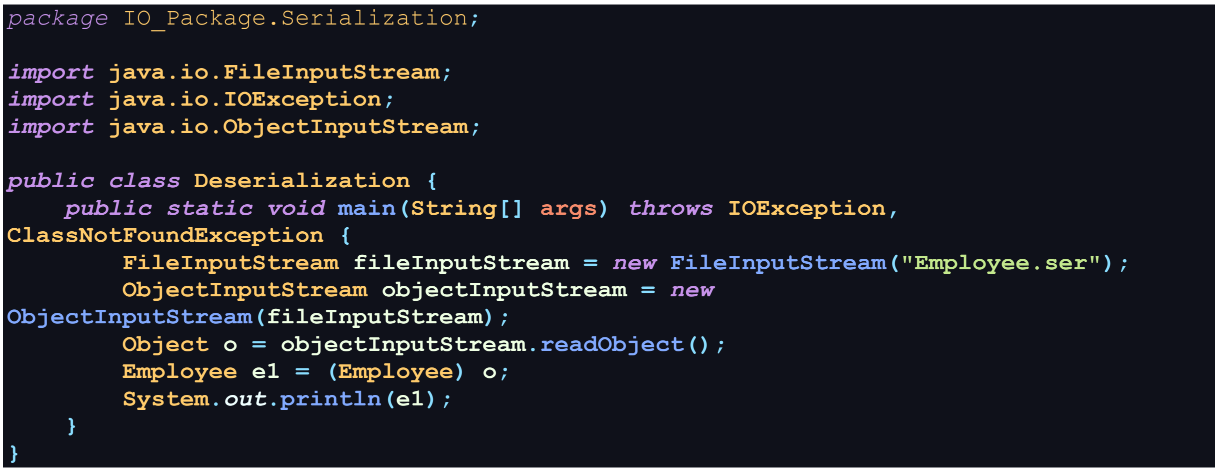
Step 3: Check the employee.ser file which is not readable or understandable.



The file was loaded in a wrong encoding: 'UTF-8'   Reload in another encodin

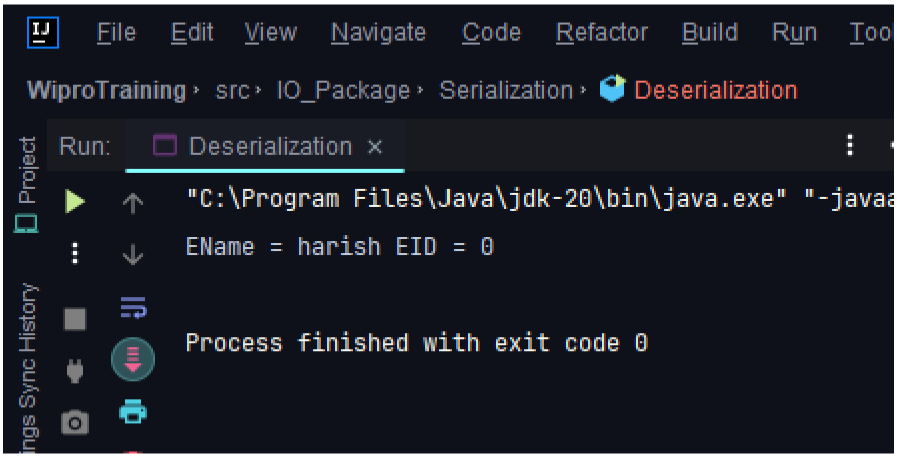
```
��NULENQsrNUL!IO_Package.Serialization.Employee�D��8P��STXNULSOHLNULENQenametNULDC2Ljava/lang/String;xptNULACKharish
```

Step 4: Create a new class called Deserialization which helps in reading the "employee.ser" file



```
package IO_Package.Serialization;

import java.io.FileInputStream;
import java.io.IOException;
import java.io.ObjectInputStream;

public class Deserialization {
    public static void main(String[] args) throws IOException,
ClassNotFoundException {
        FileInputStream fileInputStream = new FileInputStream("Employee.ser");
        ObjectInputStream objectInputStream = new
ObjectInputStream(fileInputStream);
        Object o = objectInputStream.readObject();
        Employee e1 = (Employee) o;
        System.out.println(e1);
    }
}
```

Output:



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```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaa
EName = harish EID = 0

Process finished with exit code 0
```

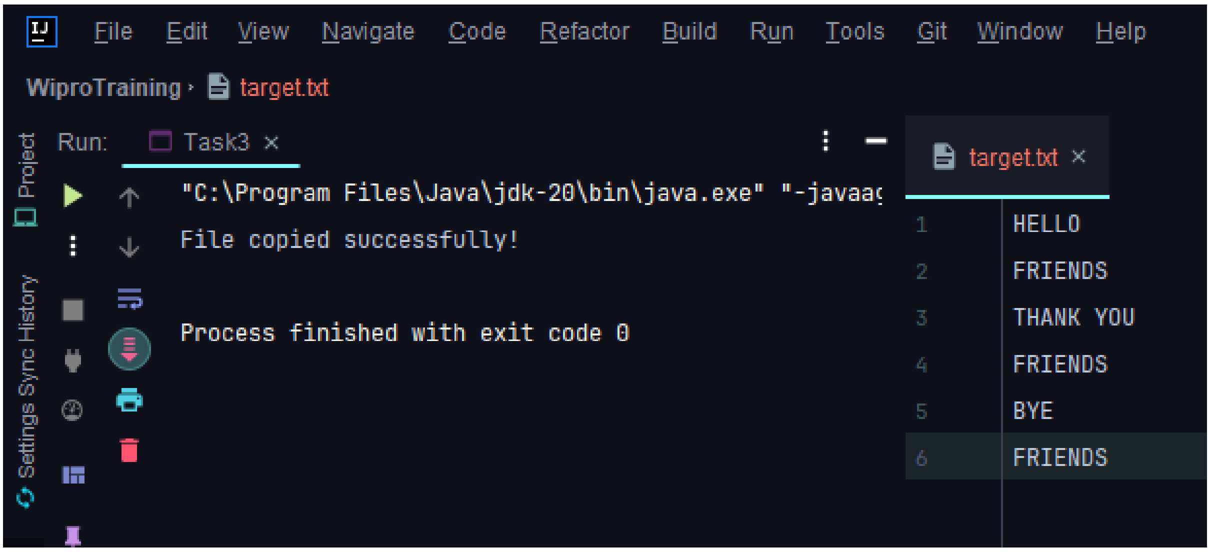
Task 3: New IO (NIO)

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

Program:

```
package Assignments.Day20;

import java.io.IOException;
import java.nio.ByteBuffer;
import java.nio.channels.FileChannel;
import java.nio.file.Path;
import java.nio.file.Paths;
import java.nio.file.StandardOpenOption;

public class Task3 {
    public static void main(String[] args) {
        Path sourceFilePath = Paths.get("input.txt"); //  source file
        Path targetFilePath = Paths.get("target.txt"); // target file

        try (FileChannel sourceChannel = FileChannel.open(sourceFilePath,
StandardOpenOption.READ);
             FileChannel targetChannel = FileChannel.open(targetFilePath,
StandardOpenOption.CREATE,
                     StandardOpenOption.WRITE)) {

            ByteBuffer buffer = ByteBuffer.allocate(1024);

            while (sourceChannel.read(buffer) != -1) {
                buffer.flip(); // Prepare buffer for writing
                targetChannel.write(buffer);
                buffer.clear(); // Clear buffer for next read
            }

            System.out.println("File copied successfully!");
        } catch (IOException e) {
            e.printStackTrace();
        }
    }
}
```

Output:



```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaag
File copied successfully!

Process finished with exit code 0
```

```
HELLO
FRIENDS
THANK YOU
FRIENDS
BYE
FRIENDS
```

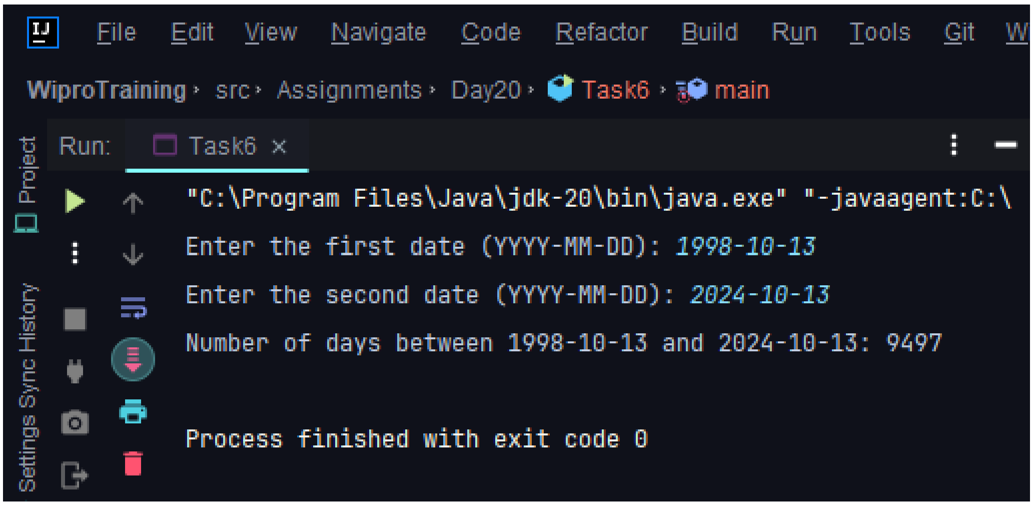
Task 6: Java 8 Date and Time API

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

Program:

```java
package Assignments.Day20;

import java.time.LocalDate;
import java.time.temporal.ChronoUnit;
import java.util.Scanner;

public class Task6 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the first date (YYYY-MM-DD): ");
        String dateString1 = scanner.nextLine();
        LocalDate date1 = LocalDate.parse(dateString1);

        System.out.print("Enter the second date (YYYY-MM-DD): ");
        String dateString2 = scanner.nextLine();
        LocalDate date2 = LocalDate.parse(dateString2);

        long daysBetween = ChronoUnit.DAYS.between(date1, date2);

        System.out.println("Number of days between " + date1 + " and " + date2 + ": " + daysBetween);
    }
}
```

Output:



```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\
Enter the first date (YYYY-MM-DD): 1998-10-13
Enter the second date (YYYY-MM-DD): 2024-10-13
Number of days between 1998-10-13 and 2024-10-13: 9497

Process finished with exit code 0
```

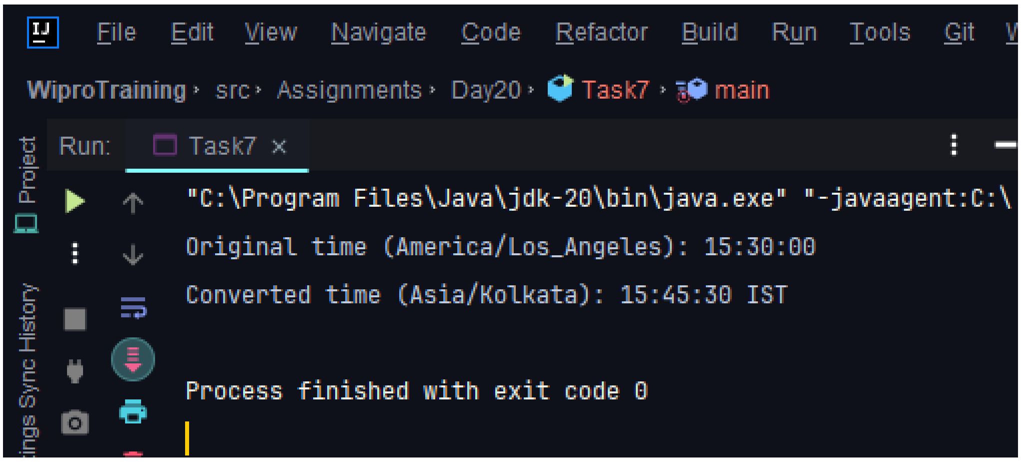
Task 7: Timezone

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

Program:

```
package Assignments.Day20;

import java.time.Instant;
import java.time.ZoneId;
import java.time.ZonedDateTime;
import java.time.format.DateTimeFormatter;

public class Task7 {

    public static void main(String[] args) {

        String time = "15:30:00";
        String fromZone = "America/Los_Angeles";
        String toZone = "Asia/Kolkata";

        Instant instant = Instant.parse("2024-06-09T10:15:30.00Z");

        ZonedDateTime sourceDateTime = ZonedDateTime.ofInstant(instant,
ZoneId.of(fromZone));

        ZonedDateTime targetDateTime =
sourceDateTime.withZoneSameInstant(ZoneId.of(toZone));

        DateTimeFormatter formatter = DateTimeFormatter.ofPattern("HH:mm:ss z");

        String formattedTargetTime = formatter.format(targetDateTime);

        System.out.println("Original time (" + fromZone + "): " + time);
        System.out.println("Converted time (" + toZone + "): " +
formattedTargetTime);
    }
}
```

Output:



```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\
Original time (America/Los_Angeles): 15:30:00
Converted time (Asia/Kolkata): 15:45:30 IST

Process finished with exit code 0
```