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

```
package Day20;


import java.io.*;
import java.net.ServerSocket;
import java.net.Socket;
import java.util.Scanner;



class Operation implements Serializable {
    private static final long serialVersionUID = 1L;
    private int number1;
    private int number2;
    private String operator;

    public Operation(int number1, int number2, String operator) {
        this.number1 = number1;
        this.number2 = number2;
        this.operator = operator;
    }

    public int getNumber1() {
        return number1;
    }

    public int getNumber2() {
        return number2;
    }

    public String getOperator() {
        return operator;
```

```
    }
}

// Server class to handle client requests
public class CalculationClient {

    public static void main(String[] args) {
        try (ServerSocket serverSocket = new ServerSocket(12345)) {
            System.out.println("Server is listening on port 12345");
            while (true) {
                try (Socket socket = serverSocket.accept()) {
                    ObjectInputStream ois = new ObjectInputStream(socket.getInputStream());
                    ObjectOutputStream oos = new ObjectOutputStream(socket.getOutputStream());

                    Operation operation = (Operation) ois.readObject();
                    int result = performOperation(operation);

                    oos.writeObject(result);
                } catch (Exception e) {
                    e.printStackTrace();
                }
            }
        } catch (IOException e) {
            e.printStackTrace();
        }
    }

    private static int performOperation(Operation operation) {
        int number1 = operation.getNumber1();
        int number2 = operation.getNumber2();
        String operator = operation.getOperator();

        switch (operator) {
            case "+":
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            return number1 + number2;
        case "-":
            return number1 - number2;
        case "*":
            return number1 * number2;
        case "/":
            return number2 != 0 ? number1 / number2 : 0;  // Handle division by zero
        default:
            throw new IllegalArgumentException("Invalid operator: " + operator);
      }
   }
}

// Client class to send requests to the server
class OperationClient {

   public static void main(String[] args) {
      try (Socket socket = new Socket("localhost", 12345)) {
         ObjectOutputStream oos = new ObjectOutputStream(socket.getOutputStream());
         ObjectInputStream ois = new ObjectInputStream(socket.getInputStream());

         Scanner scanner = new Scanner(System.in);

         System.out.println("Enter first number: ");
         int number1 = scanner.nextInt();
         System.out.println("Enter second number: ");
         int number2 = scanner.nextInt();
         System.out.println("Enter operator (+, -, *, /): ");
         String operator = scanner.next();

         Operation operation = new Operation(number1, number2, operator);
         oos.writeObject(operation);

         int result = (int) ois.readObject();
```

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            System.out.println("Result: " + result);


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