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//Problem 1: String Analysis (Easy Level)

```
import java.util.Scanner;

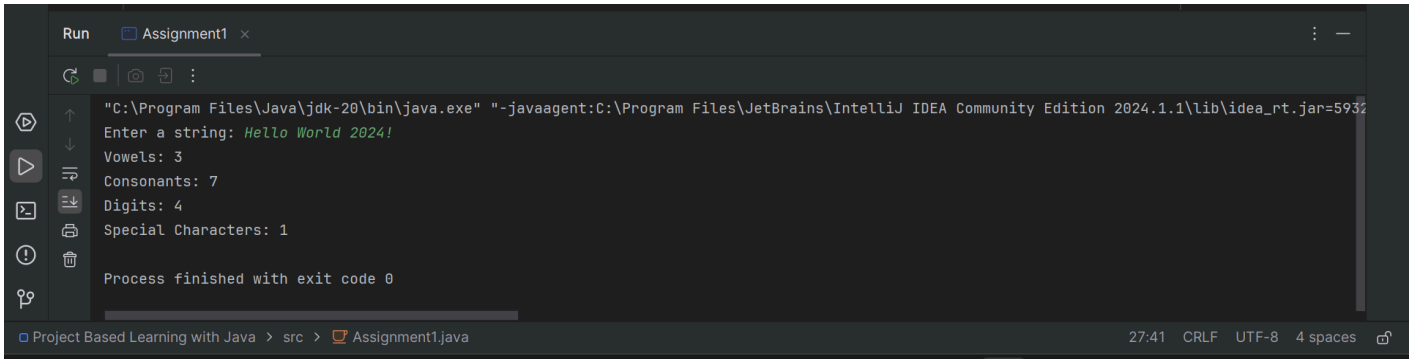
public class Assignment1 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a string: ");
        String input = scanner.nextLine();

        int vowels = 0, consonants = 0, digits = 0, specialChars = 0;
        String vowelSet = "aeiouAEIOU";

        for (char ch : input.toCharArray()) {
            if (Character.isLetter(ch)) {
                if (vowelSet.indexOf(ch) != -1)
                    vowels++;
                else
                    consonants++;
            } else if (Character.isDigit(ch)) {
                digits++;
            } else if (!Character.isWhitespace(ch)) {
                specialChars++;
            }
        }

        System.out.println("Vowels: " + vowels);
        System.out.println("Consonants: " + consonants);
        System.out.println("Digits: " + digits);
        System.out.println("Special Characters: " + specialChars);

        scanner.close();
    }
}
```



//Problem 2: Matrix Operations (Medium Level)

```
import java.util.Scanner;

public class Assignment1 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.println("Enter the size of the matrices (rows and columns): ");
        int rows = scanner.nextInt();
        int cols = scanner.nextInt();

        int[][] matrix1 = new int[rows][cols];
        int[][] matrix2 = new int[rows][cols];

        System.out.println("Enter elements of Matrix 1:");
        inputMatrix(scanner, matrix1);
        System.out.println("Enter elements of Matrix 2:");
        inputMatrix(scanner, matrix2);

        System.out.println("Addition:");
        printMatrix(addMatrices(matrix1, matrix2));

        System.out.println("Subtraction:");
        printMatrix(subtractMatrices(matrix1, matrix2));

        if (rows == cols) {
            System.out.println("Multiplication:");
            printMatrix(multiplyMatrices(matrix1, matrix2));
        } else {
            System.out.println("Multiplication not possible with different dimensions.");
```

```
    }

    scanner.close();
}

private static void inputMatrix(Scanner scanner, int[][] matrix) {
    for (int i = 0; i < matrix.length; i++)
        for (int j = 0; j < matrix[i].length; j++)
            matrix[i][j] = scanner.nextInt();
}

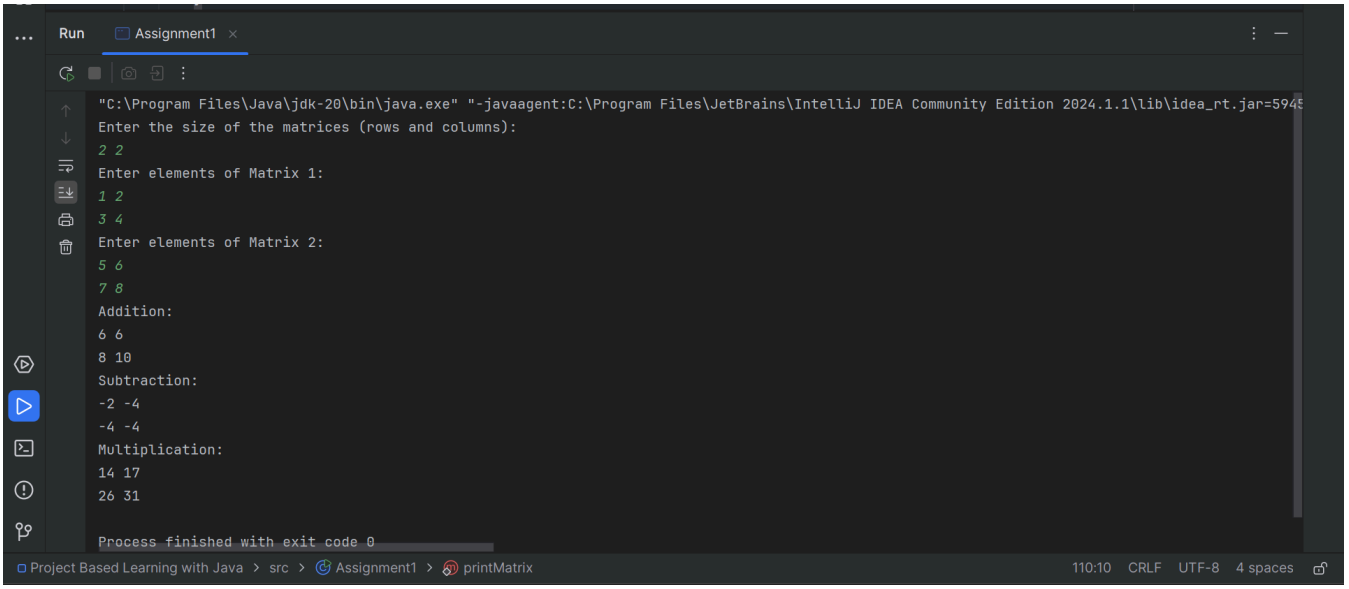
private static int[][] addMatrices(int[][] m1, int[][] m2) {
    int[][] result = new int[m1.length][m1[0].length];
    for (int i = 0; i < m1.length; i++)
        for (int j = 0; j < m1[0].length; j++)
            result[i][j] = m1[i][j] + m2[i][j];
    return result;
}

private static int[][] subtractMatrices(int[][] m1, int[][] m2) {
    int[][] result = new int[m1.length][m1[0].length];
    for (int i = 0; i < m1.length; i++)
        for (int j = 0; j < m1[0].length; j++)
            result[i][j] = m1[i][j] - m2[i][j];
    return result;
}

private static int[][] multiplyMatrices(int[][] m1, int[][] m2) {
    int n = m1.length;
    int[][] result = new int[n][n];
    for (int i = 0; i < n; i++)
        for (int j = 0; j < n; j++)
            for (int k = 0; k < n; k++)
                result[i][j] += m1[i][k] * m2[k][j];
    return result;
}

private static void printMatrix(int[][] matrix) {
    for (int[] row : matrix) {
        for (int num : row)
            System.out.print(num + " ");
        System.out.println();
    }
}
```

}



//Problem 3: Basic Banking System (Hard Level)

```
import java.util.Scanner;

class BankAccount {
    private String accountHolder;
    private int accountNumber;
    private double balance;

    public BankAccount(String accountHolder, int accountNumber, double
initialBalance) {
        this.accountHolder = accountHolder;
        this.accountNumber = accountNumber;
        this.balance = initialBalance;
    }

    public void deposit(double amount) {
        balance += amount;
        System.out.println("Deposit successful! Current Balance: " + balance);
    }

    public void withdraw(double amount) {
        if (amount > balance) {
            System.out.println("Error: Insufficient funds. Current Balance: " + balance);
        } else {
```

```
            balance -= amount;
            System.out.println("Withdrawal successful! Current Balance: " + balance);
        }
    }

    public void displayAccountInfo() {
        System.out.println("Account Holder: " + accountHolder);
        System.out.println("Account Number: " + accountNumber);
        System.out.println("Balance: " + balance);
    }
}

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

        System.out.println("Create Account:");
        System.out.print("Name: ");
        String name = scanner.nextLine();
        System.out.print("Account Number: ");
        int accNumber = scanner.nextInt();
        System.out.print("Initial Balance: ");
        double balance = scanner.nextDouble();

        BankAccount account = new BankAccount(name, accNumber, balance);

        while (true) {
            System.out.println("\nChoose an operation:");
            System.out.println("1. Deposit");
            System.out.println("2. Withdraw");
            System.out.println("3. Account Info");
            System.out.println("4. Exit");
            System.out.print("Enter choice: ");
            int choice = scanner.nextInt();

            switch (choice) {
                case 1:
                    System.out.print("Enter deposit amount: ");
                    double depositAmount = scanner.nextDouble();
                    account.deposit(depositAmount);
                    break;
                case 2:
                    System.out.print("Enter withdrawal amount: ");
                    double withdrawAmount = scanner.nextDouble();
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```
                account.withdraw(withdrawAmount);
                break;
            case 3:
                account.displayAccountInfo();
                break;
            case 4:
                System.out.println("Exiting... Thank you!");
                scanner.close();
                return;
            default:
                System.out.println("Invalid choice! Try again.");
        }
    }
}
```