

Java - Sample Problem Set 2

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May 25, 2019

Write a Java program to convert binary number to decimal

```
public class BinaryDecimal {
    public static void main(String[] args) {
        long num = 110110111;
        int decimal = convertBinaryToDecimal(num);
        System.out.printf("%d in binary is %d in decimal",
            num, decimal);
    }
    public static int convertBinaryToDecimal(long num) {
        int decimalNumber = 0, i = 0;
        long remainder;
        while (num != 0) {
            remainder = num % 10;
            num /= 10;
            decimalNumber += remainder * Math.pow(2, i);
            ++i;
        }
        return decimalNumber;
    }
}
```

Write a Java program to convert binary number to decimal

When the above code is compiled and executed, it produces the following result:

| 110110111 in binary = 439 in decimal

Write a Java Program to design a Simple Calculator using switch Statement : Part I

```
import java.util.Scanner;
public class Calculator {
    public static void main(String[] args) {
        Scanner reader = new Scanner(System.in);
        System.out.print("Enter two numbers: ");
        // nextDouble() reads the next double from the keyboard
        double first = reader.nextDouble();
        double second = reader.nextDouble();
        System.out.print("Enter an operator (+, -, *, /): ");
        char operator = reader.next().charAt(0);
        double result;
        switch(operator) {
            case '+':
                result = first + second;
                break;
            case '-':
                result = first - second;
```

Write a Java Program to design a Simple Calculator using switch Statement : Part II

```
        break;
    case '*':
        result = first * second;
        break;
    case '/':
        result = first / second;
        break;
    // operator doesn't match any case constant (+, -, *,
    default:
        System.out.printf(" Error!");
        return;
    }
    System.out.printf(" %.1f%c%.1f=%.1f",
        first, operator, second, result);
}
```

Write a Java program to display Uppercased A to Z using for loop

```
public class Characters {  
    public static void main(String [] args) {  
        char c;  
        for(c = 'A'; c <= 'Z'; ++c)  
            System.out.print(c + " ");  
    }  
}
```

When the above code is compiled and executed, it produces the following result:

| A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Java Program to add two Complex numbers by passing class to a function : Part I

```
public class Complex {  
    double real;  
    double imag;  
    public Complex(double real , double imag) {  
        this.real = real;  
        this.imag = imag;  
    }  
    public static void main(String[] args) {  
        Complex n1 = new Complex(2.3 , 4.5),  
            n2 = new Complex(3.4 , 5.0),  
            temp;  
        temp = add(n1 , n2);  
        System.out.printf("Sum = %.1f + %.1fi" ,  
            temp.real , temp.imag);  
    }  
    public static Complex add(Complex n1 , Complex n2) {  
        Complex temp = new Complex(0.0 , 0.0);
```

Java Program to add two Complex numbers by passing class to a function : Part II

```
        temp.real = n1.real + n2.real;  
        temp.imag = n1.imag + n2.imag;  
        return(temp);  
    }  
}
```

When the above code is compiled and executed, it produces the following result:

| Sum = 5.7 + 9.5i

Concatenate Two Arrays : Part I

```
import java.util.Arrays;
public class ConcatArrays {
    public static void main(String[] args) {
        int[] array1 = {1, 2, 3};
        int[] array2 = {4, 5, 6};
        int length = array1.length + array2.length;
        int[] result = new int[length];
        int pos = 0;
        for (int element : array1) {
            result[pos] = element;
            pos++;
        }
        for (int element : array2) {
            result[pos] = element;
            pos++;
        }
        System.out.println(Arrays.toString(result));
    }
}
```

Concatenate Two Arrays : Part II

When the above code is compiled and executed, it produces the following result:

| [1, 2, 3, 4, 5, 6]

Program to count vowels, consonants, digits and spaces : Part I

```
public class CountVowelConsonat {
    public static void main(String[] args) {
        String line = "This_website_is_aw3som3.";
        int vowels = 0, consonants = 0, digits = 0, spaces = 0;
        line = line.toLowerCase();
        for(int i = 0; i < line.length(); ++i) {
            char ch = line.charAt(i);
            if(ch == 'a' || ch == 'e' || ch == 'i'
                || ch == 'o' || ch == 'u') {
                ++vowels;
            }
            else if((ch >= 'a' && ch <= 'z')) {
                ++consonants;
            }
            else if( ch >= '0' && ch <= '9')
            {
                ++digits;
            }
        }
    }
}
```

Program to count vowels, consonants, digits and spaces :

Part II

```
    }  
    else if (ch == ' ')  
    {  
        ++spaces;  
    }  
}  
System.out.println("Vowels:" + vowels);  
System.out.println("Consonants:" + consonants);  
System.out.println("Digits:" + digits);  
System.out.println("White spaces:" + spaces);  
}  
}
```

When the above code is compiled and executed, it produces the following result:

```
Vowels: 7  
Consonants: 11  
Digits: 2  
White spaces: 3
```

Write a Java Program to Check Whether a Number is Even or Odd

```
import java.util.Scanner;
public class EvenOdd {
    public static void main(String[] args) {
        Scanner reader = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int num = reader.nextInt();
        if(num % 2 == 0)
            System.out.println(num + " is even");
        else
            System.out.println(num + " is odd");
    }
}
```

When the above code is compiled and executed, it produces the following result:

```
Enter a number: 5
5 is odd
```

Write a Java program to find factors of a positive integer

```
public class Factors {  
    public static void main(String[] args) {  
        int number = 60;  
        System.out.print(" Factors of " + number + " are: ");  
        for(int i = 1; i <= number; ++i) {  
            if (number % i == 0) {  
                System.out.print(i + " ");  
            }  
        }  
    }  
}
```

When the above code is compiled and executed, it produces the following result:

| Factors of 60 are: 1 2 3 4 5 6 10 12 15 20 30 60

Write a Java program to display fibonacci series using for loop

```
public class Fibonacci {  
    public static void main(String[] args) {  
        int n = 10, t1 = 0, t2 = 1;  
        System.out.print(" First " + n + " terms: ");  
        for (int i = 1; i <= n; ++i) {  
            System.out.print(t1 + " + ");  
            int sum = t1 + t2;  
            t1 = t2;  
            t2 = sum;  
        }  
    }  
}
```

When the above code is compiled and executed, it produces the following result:

| First 10 terms: 0 + 1 + 1 + 2 + 3 + 5 + 8 + 13 + 21 + 34 +

Find frequency of a character in a String

```
public class Frequency {  
    public static void main(String[] args) {  
        String str = "This website is awesome.";  
        char ch = 'e';  
        int frequency = 0;  
        for(int i = 0; i < str.length(); i++) {  
            if(ch == str.charAt(i)) {  
                ++frequency;  
            }  
        }  
        System.out.println("Frequency of "+ch+"="+frequency);  
    }  
}
```

When the above code is compiled and executed, it produces the following result:

| Frequency of e = 4

Write a Java program to find GCD of two numbers using for loop and if statement

```
public class GCD {  
    public static void main(String[] args) {  
        int n1 = 81, n2 = 153, gcd = 1;  
        for(int i = 1; i <= n1 && i <= n2; ++i) {  
            // Checks if i is factor of both integers  
            if(n1 % i==0 && n2 % i==0)  
                gcd = i;  
        }  
        System.out.printf("G.C.D of %d and %d is %d",  
            n1, n2, gcd);  
    }  
}
```

When the above code is compiled and executed, it produces the following result:

| G.C.D of 81 and 153 is 9

Write a Java Program to Check a Leap Year : Part I

```
public class Leapyear {  
    public static void main(String[] args) {  
        int year = 1900;  
        boolean leap = false;  
        if(year % 4 == 0) {  
            if( year % 100 == 0) {  
                // year is divisible by 400,  
                //hence the year is a leap year  
                if ( year % 400 == 0)  
                    leap = true;  
                else  
                    leap = false;  
            }  
            else  
                leap = true;  
        }  
        else  
            leap = false;  
        if(leap)
```

Write a Java Program to Check a Leap Year : Part II

```
        System.out.println(year + " is a leap year.");  
    else  
        System.out.println(year + " is not a leap year.");  
    }  
}
```

When the above code is compiled and executed, it produces the following result:

| 1900 is not a leap year.

Write a Java program to generate multiplication table using for loop

```
public class MultiplicationTable {  
    public static void main(String[] args) {  
        int num = 5;  
        for(int i = 1; i <= 10; ++i) {  
            System.out.printf("%d * %d = %d\n",  
                               num, i, num * i);  
        }  
    }  
}
```

Write a Java program to count number of Digits in an Integer using while loop

```
public class NumberDigits {  
    public static void main(String[] args) {  
        int count = 0, num = 3452;  
        while(num != 0) {  
            // num = num/10  
            num /= 10;  
            ++count;  
        }  
        System.out.println("Number_of_digits:_ " + count);  
    }  
}
```

When the above code is compiled and executed, it produces the following result:

| Number of digits: 4

Write a Java program to check Palindrome using while loop : Part I

```
public class Palindrome {
    public static void main(String[] args) {
        int num = 121, reversedInteger = 0;
        int remainder, originalInteger;
        originalInteger = num;
        // reversed integer is stored in variable
        while( num != 0 ) {
            remainder = num % 10;
            reversedInteger = reversedInteger * 10 + remainder;
            num /= 10;
        }
        // palindrome if originalInteger
        // and reversedInteger are equal
        if (originalInteger == reversedInteger)
            System.out.println(originalInteger +
                               " is a palindrome.");
        else
```

Write a Java program to check Palindrome using while loop : Part II

```
        System.out.println(originalInteger +  
            " is not a palindrome.");  
    }  
}
```

When the above code is compiled and executed, it produces the following result:

| 121 is a palindrome.

Write a Java program to check prime number using a for loop : Part I

```
public class Prime {  
    public static void main(String[] args) {  
        int num = 29;  
        boolean flag = false;  
        for(int i = 2; i <= num/2; ++i) {  
            // condition for nonprime number  
            if(num % i == 0) {  
                flag = true;  
                break;  
            }  
        }  
        if (!flag)  
            System.out.println(num + " is a prime number.");  
        else  
            System.out.println(num + " is not a prime number.");  
    }  
}
```


Write a Java program to check prime number using a for loop : Part II

When the above code is compiled and executed, it produces the following result:

| 29 is a prime number.

Write a Java program to Calculate Difference Between Two Time Periods : Part I

```
public class Time {
    int seconds;
    int minutes;
    int hours;
    public Time(int hours, int minutes, int seconds) {
        this.hours = hours;
        this.minutes = minutes;
        this.seconds = seconds;
    }
    public static void main(String[] args) {
        Time start = new Time(12, 34, 55),
            stop = new Time(8, 12, 15),
            diff;

        diff = difference(start, stop);

        System.out.printf("TIME DIFFERENCE: %d:%d:%d\n",
```

Write a Java program to Calculate Difference Between Two Time Periods : Part II

```
        start.hours, start.minutes, start.seconds);
System.out.printf("%d:%d:%d_",
        stop.hours, stop.minutes, stop.seconds);
System.out.printf("=%d:%d:%d\n",
        diff.hours, diff.minutes, diff.seconds);
}

public static Time difference(Time start, Time stop) {
    Time diff = new Time(0, 0, 0);

    if(stop.seconds > start.seconds){
        --start.minutes;
        start.seconds += 60;
    }

    diff.seconds = start.seconds - stop.seconds;
    if(stop.minutes > start.minutes){
        --start.hours;
    }
}
```

Write a Java program to Calculate Difference Between Two Time Periods : Part III

```
        start.minutes += 60;
    }

    diff.minutes = start.minutes - stop.minutes;
    diff.hours = start.hours - stop.hours;

    return (diff);
}
}
```

When the above code is compiled and executed, it produces the following result:

| TIME DIFFERENCE: 12:34:55 - 8:12:15 = 4:22:40

Write a Java program to Find Transpose of a Matrix : Part I

```
public class Transpose {  
    public static void main(String[] args) {  
        int row = 2, column = 3;  
        int [][] matrix = { {2, 3, 4}, {5, 6, 4} };  
        // Display current matrix  
        display(matrix);  
        // Transpose the matrix  
        int [][] transpose = new int[column][row];  
        for(int i = 0; i < row; i++) {  
            for (int j = 0; j < column; j++) {  
                transpose[j][i] = matrix[i][j];  
            }  
        }  
        // Display transposed matrix  
        display(transpose);  
    }  
    public static void display(int [][] matrix) {
```

Write a Java program to Find Transpose of a Matrix : Part II

```
System.out.println("The matrix is:");  
for(int[] row : matrix) {  
    for (int column : row) {  
        System.out.print(column + " ");  
    }  
    System.out.println();  
}  
}  
}
```

References



DEITEL, Java How to Program, 11/e



Java: the complete reference, Herbert Schildt, McGraw-Hill Education Group