**Java Assignment 1**

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**1.Write a program that takes a number from the user between 1 to 12 and displays the name of the month.**

package com.programming.day1;

**import** java.util.\*;

public class MonthName {

**public** **static** **void** main(String[] args) {

   Scanner sc = **new** Scanner(System.***in***);

          System.***out***.print("Enter a number between 1 and 12: ");

**int** monthNumber = sc.nextInt();

        String monthName;

**switch** (monthNumber) {

**case** 1:

monthName = "January";

**break**;

**case** 2:

monthName = "February";

**break**;

**case** 3:

monthName = "March";

**break**;

**case** 4:

monthName = "April";

**break**;

**case** 5:

monthName = "May";

**break**;

**case** 6:

monthName = "June";

**break**;

**case** 7:

monthName = "July";

**break**;

**case** 8:

monthName = "August";

**break**;

**case** 9:

monthName = "September";

**break**;

**case** 10:

monthName = "October";

**break**;

**case** 11:

monthName = "November";

**break**;

**case** 12:

monthName = "December";

**break**;

**default**:

monthName = "Invalid input";

**break**;

        }

        System.***out***.println(month Name);

  }

}

**2.Write a program to display calculated result of two numbers based on the mathematical operator entered.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** Calculator {

**public** **static** **void** main(String[] args) {

    Scanner sc = **new** Scanner(System.***in***);

        System.***out***.print("Enter the first number: ");

**double** num1 = sc.nextDouble();

        System.***out***.print("Enter the second number: ");

**double** num2 = sc.nextDouble();

       System.***out***.print("Enter an operator (+, -, \*, /): ");

**char** operator = sc.next().charAt(0);

**double** result;

**switch** (operator) {

**case** '+':  result = num1 + num2;

**break**;

**case** '-':  result = num1 - num2;

**break**;

**case** '\*':   result = num1 \* num2;

**break**;

**case** '/':  **if** (num2 != 0) {

                    result = num1 / num2;

                } **else** {

                     System.***out***.println("Error: Division by zero is not allowed.");

**return**;

                }

**break**;

**default**:  System.***out***.println("Invalid operator.");

**return**;

        }

        System.***out***.println("The result is: " + result);

    }

  }

**3.write a program to check the grade based on marks obtained by students.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** GradeChecker {

**public** **static** **void** main(String[] args) {

    Scanner sc = **new** Scanner(System.***in***);

          System.***out***.print("Enter the total marks: ");

**int** totalMarks = sc.nextInt();

        System.***out***.print("Enter the obtained marks: ");

**int** obtainedMarks = sc.nextInt();

**double** percentage = (obtainedMarks / (**double**)totalMarks) \* 100;

            String grade;

**if** (percentage >= 60) {

            grade = "Grade A";

        } **else** **if** (percentage >= 45) {

            grade = "Grade B";

        } **else** **if** (percentage >= 35) {

            grade = "Grade C";

        } **else** {

            grade = "Fail";

        }

        System.***out***.println("Percentage: " + percentage + "%");

        System.***out***.println("Output: " + grade);

}   }

**4.Write a program to add two complex numbers.**

package com.programming.day1;

**import** java.util.\*;

**class** ComplexNumber\_Addition {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

        System.***out***.print("Enter the first complex number (in the form a+bi): ");

        String firstComplex = sc.nextLine();

        System.***out***.print("Enter the second complex number (in the form a+bi): ");

        String secondComplex = sc.nextLine();

        String[] parts1 = firstComplex.split("\\+");

**int** a1 = Integer.*parseInt*(parts1[0].trim());

**int** b1 = Integer.*parseInt*(parts1[1].replace("i", "").trim());

        String[] parts2 = secondComplex.split("\\+");

**int** a2 = Integer.*parseInt*(parts2[0].trim());

**int** b2 = Integer.*parseInt*(parts2[1].replace("i", "").trim());

**int** realPart = a1 + a2;

**int** imaginaryPart = b1 + b2;

      System.***out***.println("The sum of the complex numbers is: " + realPart + "+" + imaginaryPart + "i");

    }

}

**5.Write a program to check if a given integer is Odd or Even.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** OddorEven {

**public** **static** **void** main(String[] args) {

    Scanner sc = **new** Scanner(System.***in***);

 System.***out***.print("Enter an integer: ");

**int** number = sc.nextInt();

**if** (number % 2 == 0) {

    System.***out***.println("EVEN");

}

**else** {

    System.***out***.println("ODD");

}

}

}

**6.Write a program to find the largest of three numbers.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** LargestofThree {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

        System.***out***.print("Enter three integers: ");

**int** num1 = sc.nextInt();

**int** num2 = sc.nextInt();

**int** num3 = sc.nextInt();

**int** largest;

**if** (num1 >= num2 && num1 >= num3) {

            largest = num1;

        } **else** **if** (num2 >= num1 && num2 >= num3) {

            largest = num2;

        } **else** {

            largest = num3;

        }

                 System.***out***.println("Largest number: " + largest);

   }

  }

**7.Write a program to find the LCM f two numbers.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** LcmCalculator {

**public** **static** **int** gcd(**int** a, **int** b) {

**while** (b != 0) {

**int** temp = b;

              b = a % b;

              a = temp;

          }

**return** a;

      }

**public** **static** **int** lcm(**int** a, **int** b) {

**return** Math.*abs*(a \* b) / *gcd*(a, b);

      }

**public** **static** **void** main(String[] args) {

  Scanner sc = **new** Scanner(System.***in***);

             System.***out***.print("Enter two numbers: ");

**int** num1 = sc.nextInt();

**int** num2 = sc.nextInt();

**int** resultLCM = *lcm*(num1, num2);

             System.***out***.println("LCM is " + resultLCM);

      }

  }

**8.Write a program to find the GCD or HCF of two numbers**

package com.programming.day1;

**import** java.util.\*;

**public** **class** GCD {

**public** **static** **void** main(String[] args) {

    Scanner sc = **new** Scanner(System.***in***);

           System.***out***.print("Enter two integers: ");

**int** num1 = sc.nextInt();

**int** num2 = sc.nextInt();

**int** hcf = *findGCD*(num1, num2);

            System.***out***.println("HCF is " + hcf);

            scanner.close();

        }

**public** **static** **int** findGCD(**int** a, **int** b) {

**while** (b != 0) {

**int** temp = b;

                b = a % b;

                a = temp;

            }

**return** a;

        }

    }

**9.Write a program to find all the prime numbers from 1 to  N.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** PrimeNumbers {

**public** **static** **boolean** isPrime(**int** number) {

**if** (number <= 1) **return** **false**;

**if** (number <= 3) **return** **true**;

**if** (number % 2 == 0 || number % 3 == 0) **return** **false**;

**for** (**int** i = 5; i \* i <= number; i += 6) {

**if** (number % i == 0 || number % (i + 2) == 0) **return** **false**;

 }

**return** **true**;

 }

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

  System.***out***.print("Enter a number: ");

**int** N = sc.nextInt();

 System.***out***.print("Prime numbers from 1 to " + N + ": ");

**for** (**int** i = 2; i <= N; i++) {

**if** (*isPrime*(i)) {

 System.***out***.print(i + " ");

 }

 }

  }

}

**10.Write a program to find whether a given year is a Leap Year or not.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** LeapYear {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

 System.***out***.print("Enter a year: ");

**int** year = sc.nextInt();

**boolean** isLeap = **false**;

**if** (year % 4 == 0) {

**if** (year % 100 == 0) {

**if** (year % 400 == 0) {

 isLeap = **true**;

 }

 } **else** {

 isLeap = **true**;

 }

 }

**if** (isLeap) {

 System.***out***.println("Leap year");

 } **else** {

 System.***out***.println("Not a leap year");

 }

 }

}

**11.Write a program to check whether a character is Vowel or Consonant.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** VowelOrConsonant {

**public** **static** **void** main(String[] args) {

 Scanner sc = **new** Scanner(System.***in***);

  System.***out***.print("Enter a character: ");

**char** ch = sc.next().charAt(0);

**if** (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u' ||

 ch == 'A' || ch == 'E' || ch == 'I' || ch == 'O' || ch == 'U') {

 System.***out***.println("Vowel");

 } **else** **if** ((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z')) {

 System.***out***.println("Consonant");

 } **else** {

 System.***out***.println("Invalid input");

 }

 }

 }

**12.Write a program to calculate simple interest.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** SimpleInterestCalculator {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

System.***out***.print("Enter the principal amount: ");

**double** principal = sc.nextDouble();

System.***out***.print("Enter the annual interest rate (in percentage): ");

**double** rate = sc.nextDouble();

System.***out***.print("Enter the time period (in years): ");

**double** time = sc.nextDouble();

**double** simpleInterest = (principal \* rate \* time) / 100;

System.***out***.printf("The simple interest is: %.2f%n", simpleInterest);

}

}

**13..Write a program to calculate compound interest.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** CompoundInterestCalculator {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

 System.***out***.print("Enter the principal amount (P): ");

**double** principal = sc.nextDouble();

  System.***out***.print("Enter the annual interest rate (in percentage): ");

**double** annualRate = sc.nextDouble();

**double** rate = annualRate / 100;

System.***out***.print("Enter the number of times interest is compounded per year (n): ");

**int** timesCompounded = sc.nextInt();

System.***out***.print("Enter the number of years (t): ");

**int** years = sc.nextInt();

**double** amount = principal \* Math.*pow*(1 + (rate / timesCompounded), timesCompounded \* years);

 System.***out***.printf("The amount after %d years is: %.2f\n", years, amount);

 }

}

**14.Write a program to find the perimeter of a Rectangle.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** RectanglePerimeter {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

 System.***out***.print("Enter the length of the rectangle: ");

**int** length = sc.nextInt();

 System.***out***.print("Enter the breadth of the rectangle: ");

**int** breadth = sc.nextInt();

**int** perimeter = 2 \* (length + breadth);

System.***out***.println("Perimeter of the rectangle: " + perimeter);

   }

}

**15.Write a program that prompts the user to input an integer and then outputs the number with the digits reversed.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** ReverseDigits {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

System.***out***.print("Enter an integer: ");

**int** number = sc.nextInt();

String numberStr = Integer.*toString*(number);

String reversedStr = **new** StringBuilder(numberStr).reverse().toString();

System.***out***.println("Reversed number: " + reversedStr);

}

}

**16.Write a program to accept two numbers and find the power of each(Do not use java built-in method).**

package com.programming.day1;

**import** java.util.\*;

**public** **class** PowerCalculator {

**public** **static** **int** power(**int** base, **int** exponent) {

**int** result = 1;

**for** (**int** i = 0; i < exponent; i++) {

 result \*= base;

 }

**return** result;

 }

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

 System.***out***.print("Enter base and exponent (separated by space): ");

**int** base = sc.nextInt();

**int** exponent = sc.nextInt();

**int** result = *power*(base, exponent);

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

 }

}

**17.Write a program to check Armstrong number between two integers.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** AmstrongNumberFinder {

**public** **static** **boolean** isArmstrong(**int** number) {

**int** sum = 0;

**int** originalNumber = number;

**int** numDigits = String.*valueOf*(number).length();

**while** (number > 0) {

**int** digit = number % 10;

 sum += Math.*pow*(digit, numDigits);

 number /= 10;

 }

**return** sum == originalNumber;

 }

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

  System.***out***.print("Enter the range (two integers separated by space): ");

**int** lowerBound = sc.nextInt();

**int** upperBound = sc.nextInt();

  System.***out***.println("Armstrong numbers between " + lowerBound + " and " + upperBound + ":");

**for** (**int** num = lowerBound; num <= upperBound; num++) {

**if** (*isArmstrong*(num)) {

 System.***out***.println(num);

 }

 }

 }

}

**18.Write a program to check if a number is Neon Number or Not**.

(Note:A neon number is a number where the sum of digits of the square of the number is equal to the number).

package com.programming.day1;

**import** java.util.\*;

**public** **class** Neon {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

 System.***out***.print("Enter a number to check if it's a Neon number: ");

**int** number = sc.nextInt();

**if** (*isNeonNumber*(number)) {

 System.***out***.println(number + " is a Neon number.");

 } **else** {

 System.***out***.println(number + " is not a Neon number.");

 }

 }

**public** **static** **boolean** isNeonNumber(**int** num) {

**int** square = num \* num;

**int** sumOfDigits = 0;

**while** (square > 0) {

 sumOfDigits += square % 10;

 square /= 10;

 }

**return** sumOfDigits == num;

 }

}

**19.Write a program to find the factorial of a given number.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** FactorialCalculator {

**public** **static** **int** factorialIterative(**int** number) {

**int** result = 1;

**for** (**int** i = 1; i <= number; i++) {

result \*= i;

}

**return** result;

}

**public** **static** **int** factorialRecursive(**int** number) {

**if** (number == 0) {

**return** 1;

} **else** {

**return** number \* *factorialRecursive*(number - 1);

}

}

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

System.***out***.print("Enter a number: ");

**int** number = sc.nextInt();

**int** iterativeResult = *factorialIterative*(number);

System.***out***.println("Factorial (iterative) of " + number + " is: " + iterativeResult);

**int** recursiveResult = *factorialRecursive*(number);

System.***out***.println("Factorial (recursive) of " + number + " is: " + recursiveResult);

}

}

**20.Write a program to find the sum of Fibonacci Series numbers of first N even indexes.**

package com.programming.day1;

**public** **class** FibonacciSeries {

**static** **int** Fib\_Even\_Sum(**int** N)

{

**if** (N <= 0)

**return** 0;

**int** fib[] = **new** **int**[2 \* N + 1];

fib[0] = 0;

fib[1] = 1;

**int** s = 0;

**for** (**int** j = 2; j <= 2 \* N; j++) {

fib[j] = fib[j - 1] + fib[j - 2];

**if** (j % 2 == 0)

s += fib[j];

}

**return** s;

}

**public** **static** **void** main(String[] args)

{

**int** N = 4;

System.***out***.println(

"Even sum of fibonacci series till number " + N

+ " is: " + +*Fib\_Even\_Sum*(N));

}

}

**21.Write a program to print right triangle star pattern.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** RightTrianglePattern {

**public** **static** **void** main(String[] args) {

 Scanner sc = **new** Scanner(System.***in***);

 System.***out***.print("Enter the number of rows: ");

**int** rows = sc.nextInt();

**for** (**int** i = 1; i <= rows; i++) {

**for** (**int** j = 1; j <= i; j++) {

 System.***out***.print("\* ");

 }

 System.***out***.println(); // Move to the next line after each row

 }

 }

 }

**22.Write a program to print reverse pyramid star pattern.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** ReversePyramidPattern {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

 System.***out***.print("Enter the number of rows: ");

**int** rows = sc.nextInt();

**for** (**int** i = 0; i < rows; i++) {

**for** (**int** j = 0; j < (rows - i) \* 2 - 1; j++) {

 System.***out***.print("\* ");

 }

 System.***out***.println();

 }

 }

}

**23.Write a program to print upper star triangle pattern.**

package com.programming.day1;

**public** **class** StarTriangle {

**public** **static** **void** main(String[] args) {

**int** numRows = 9;

**for** (**int** i = 1; i <= numRows; i++) {

**for** (**int** j = 1; j <= numRows - i; j++) {

 System.***out***.print(" ");

 }

**for** (**int** k = 1; k <= i; k++) {

 System.***out***.print("\*");

 }

 System.***out***.println();

 }

 }

 }

**24.Write a program to print diamond shape star pattern.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** DiamondPattern {

**public** **static** **void** main(String[] args) {

 Scanner sc = **new** Scanner(System.***in***);

 System.***out***.print("Enter an odd number of rows: ");

**int** rows = sc.nextInt();

**if** (rows % 2 == 0) {

 System.***out***.println("Please enter an odd number.");

**return**;

 }

**int** mid = rows / 2;

**for** (**int** i = 0; i <= mid; i++) {

**for** (**int** j = 0; j < mid - i; j++) {

 System.***out***.print(" ");

 }

**for** (**int** k = 0; k < 2 \* i + 1; k++) {

 System.***out***.print("\*");

 }

 System.***out***.println();

 }

**for** (**int** i = mid - 1; i >= 0; i--) {

**for** (**int** j = 0; j < mid - i; j++) {

 System.***out***.print(" ");

 }

**for** (**int** k = 0; k < 2 \* i + 1; k++) {

 System.***out***.print("\*");

 }

 System.***out***.println();

 }

   }

}

**25.Write a program to print square star pattern.**

package com.programming.day1;

**import** java.util.\*;

**public** **class** SquarestarPattern {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

System.***out***.print ("Enter the number of rows: ");

**int** rows=sc.nextInt();

 System.***out***.print("Enter the number of columns: ");

**int** cols = sc.nextInt();

*printRectanglePattern*(rows,cols);

}

**public** **static** **void** printRectanglePattern(**int** rows, **int** cols) {

**for** (**int** i=0;i<rows;i++) {

**for** (**int** j=0; j<cols; j++) {

**if** (i==0 || i==rows-1 || j==0 || j==cols - 1) {

System.***out***.print("\*");

}

**else** {

System.***out***.print(" ");

}

}

System.***out***.println();

}

}

}