**ASSIGNMENT - 2**

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**1)Write a program to enter the marks of a student in four subjects. Then calculate the total and aggregate, display the grade obtained by the student. If the student scores an aggregate greater than 75%, then the grade is Distinction. If aggregate is 60>= and <75, then the grade is First Division. If aggregate is 50 >= and <60, then the grade is Second Division. If aggregate is 40>= and <50, then the grade is Third Division. Else the grade is Fail.**

**Sample Input & Output:**

**Enter the marks in python: 90**

**Enter the marks in c programming: 91**

**Enter the marks in Mathematics: 92**

**Enter the marks in Physics: 93**

**Total= 366**

**Aggregate = 91.5**

**DISTINCTION**

**Test cases:**

**a) 18, 76,93,65**

**b) 73,78,79,75**

**c) 98,106,120,95**

**d) 96,73, -85,95**

**e) 78,59.8,76,79**

CODE:

import java.util.Scanner;

public class GradeCalculator {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter the marks in Python: ");

double python = scanner.nextDouble();

System.out.print("Enter the marks in C Programming: ");

double cProgramming = scanner.nextDouble();

System.out.print("Enter the marks in Mathematics: ");

double mathematics = scanner.nextDouble();

System.out.print("Enter the marks in Physics: ");

double physics = scanner.nextDouble();

double total = python + cProgramming + mathematics + physics;

double aggregate = total / 4;

System.out.println("Total = " + total);

System.out.println("Aggregate = " + aggregate);

if (aggregate > 75) {

System.out.println("DISTINCTION");

} else if (aggregate >= 60 && aggregate < 75) {

System.out.println("FIRST DIVISION");

} else if (aggregate >= 50 && aggregate < 60) {

System.out.println("SECOND DIVISION");

} else if (aggregate >= 40 && aggregate < 50) {

System.out.println("THIRD DIVISION");

} else {

System.out.println("FAIL");

}

}

}

2)Write a program to calculate tax given the following conditions:

a. If income is less than or equal to 1,50,000 then no tax

b. If taxable income is 1,50,001 – 3,00,000 the charge 10% tax

c. If taxable income is 3,00,001 – 5,00,000 the charge 20% tax

d. If taxable income is above 5,00,001 then charge 30% tax

Sample Input:

Enter the income:200000

Sample Output:

Tax= 20000

Test cases:

1. 400700

2. 2789239

3. 150000

4. 00000

5. -125486

import java.util.Scanner;

public class TaxCalculator {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter the income: ");

double income = scanner.nextDouble();

double tax = 0;

if (income <= 150000) {

tax = 0;

} else if (income <= 300000) {

tax = (income - 150000) \* 0.10;

} else if (income <= 500000) {

tax = 15000 + (income - 300000) \* 0.20;

} else {

tax = 45000 + (income - 500000) \* 0.30;

}

System.out.println("Tax = " + tax);

}

}

3)Write a program to print the first n perfect numbers. (Hint Perfect number means a positive integer that is equal to the sum of its proper divisors)

Sample Input:

N = 3

Sample Output:

First 3 perfect numbers are: 6 , 28 , 496

Test Cases:

1. N = 0

2. N = 5

3. N = -2

4. N = -5

5. N = 0.2

CODE:

public class PerfectNumbers {

public static void main(String[] args) {

int n = 3; // Number of perfect numbers to find

int count = 0;

int num = 2;

System.out.print("First " + n + " perfect numbers are: ");

while (count < n) {

if (isPerfectNumber(num)) {

System.out.print(num + " ");

count++;

}

num++;

}

}

public static boolean isPerfectNumber(int number) {

int sum = 1;

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

if (number % i == 0) {

sum += i;

if (i \* i != number) {

sum += number / i;

}

}

}

return sum == number;

}

}

4)Write a Program to Find the Nth Largest Number in a array.

Sample Input:

List : {14, 67, 48, 23, 5, 62}

N = 4

Sample Output:

4th Largest number: 23

Test cases:

1. N = 0

2. N = -5

3. N = 1

4. N = M

5. N = %

CODE:

import java.util.Arrays;

public class NthLargestNumber {

public static int findNthLargest(int[] arr, int n) {

Arrays.sort(arr);

return arr[arr.length - n];

}

public static void main(String[] args) {

int[] numbers = {14, 67, 48, 23, 5, 62};

int n = 4;

System.out.println(n + "th Largest number: " + findNthLargest(numbers, n));

}

}

5)Write a program to find the number of special characters in the given statement

Sample Input:

Given statement: Modi Birthday @ September 17, #&$% is the wishes code for him.

Sample Output:

Number of special Characters: 5

CODE:

public class SpecialCharacterCounter {

public static void main(String[] args) {

String statement = "Modi Birthday @ September 17, #&$% is the wishes code for him.";

int specialCharCount = 0;

for (int i = 0; i < statement.length(); i++) {

char ch = statement.charAt(i);

if (!Character.isLetterOrDigit(ch) && !Character.isWhitespace(ch)) {

specialCharCount++;

}

}

System.out.println("Number of special Characters: " + specialCharCount);

}

}