Problem Set

Fundamentals of Programming

September 25, 2020

How to submit? Archieve (i.e. Zip) your Java files. Then, submit the Zip file to **mvoctavianojr@national-u.edu.ph** with email subject: "**Activity-Assignment: <Section>**". Indicate in your email body the members of your group.

1 Activity

A. The sum of the squares of the first ten natural numbers is,

$$1^2 + 2^2 + ... + 10^2 = 385$$

The square of the sum of the first ten natural numbers is,

$$(1 + 2 + ... + 10)^2 = 3025$$

Hence the difference between the sum of the squares of the first ten natural numbers and the square of the sum is

$$3025 - 385 = 2640$$

Create a program that finds the difference between the sum of the squares of the first one hundred natural numbers and the square of the sum.
[10 points]

B. **2520** is the smallest number that can be divided by each of the numbers from 1 to 10 without any remainder. What is the smallest positive number that is evenly divisible by all of the numbers from 1 to 20?
[10 points]

2 Assignment

A. The sum of the primes below **10** is **2 + 3 + 5 + 7 = 17**.

Create a program that finds the sum of all the primes below two million.
[**10 points**]

B. 2^{15} **= 32768** and the sum of its digits is **3 + 2 + 7 + 6 + 8 = 26**.

Create a program that sums the digits of a given number 2^n where n is a user-defined integer number.
[**10 points**]

C. Let *d(n)* be defined as the sum of proper divisors of n (numbers less than n which divide evenly into n). If *d(a) = b and d(b) = a*, where $a \neq b$, then a and b are an amicable pair and each of a and b are called amicable numbers.

For example, the proper divisors of **220** are **1, 2, 4, 5, 10, 11, 20, 22, 44, 55** and **110**; therefore **d(220) = 284**. The proper divisors of **284** are **1, 2, 4, 71** and **142**; so **d(284) = 220**.

Create a program that determines whether two input integer numbers are an amicable pair.
[**10 points**]

High scores from the activity and assignment will become worthless if you learn nothing.
Resist the temptation to copy and paste the solution of others.
Goodluck!