Module 2
Java Programming - MADP 202

Assignment 5 (in-class activity)

Due: 5:30pm, June 14nd, 2017

Requirements

- This is an individual assignment.
- You are allowed to use Internet to solve these problems. You are not allowed to find and copy solutions from Internet.

Problem1

Write a Java class called Factorial . This class defines a method called factorial() which takes as its only parameter an int called n , and returns an int representing the factorial of n . The factorial of an integer n , denoted n !, is defined as n .(n-1).(n-2) _ … _ 1 (but note that 0! is 1). You MAY assume that n is a non-negative integer.

Problem2

Write a Java class called Fibonacci. This class defines a method called fibonacci() which takes as its only parameter an int called n , and returns an int representing the nth Fibonacci number. The nth Fibonacci number, denoted fn , is defined as follows:
f0 = 0
f1 = 1
fn = fn_1 + fn_2

Problem3

Write a Java class called PrimalityChecker . This class defines a method called isPrime() , which takes as its only parameter an int called n , and returns a boolean which is true if and only if n is a prime number, false otherwise. A prime number is an integer, which cannot be divided evenly by any integer except 1 and itself. You MAY assume that n is a non-negative integer.

Problem4

Write a Java class called GoldbackChecker . This class defines a method called checkGoldbach() , which takes as its only parameter an int called n , and returns an array of int . This method finds two prime numbers whose sum is equal to n , and returns these two prime numbers in an array of ints of length 2 ; if two such primes cannot be found or if n is less than 4, or n is odd, your method should return null . Your checkGoldbach() method MAY call the isPrime() method you wrote for a previous exercise. Note that every even int value greater than 4 can be expressed as the sum of two prime numbers.

Problem5

Write a Java class called PolynomialEquation. This class has a method called readPolynomial with no input but reads a polynomial equation from input. (User enters the polynomial). The user will enter a polynomial equation like this:

F(x) = 3X^10 + 5X^6 – 4X^3+5

a) Specify what should be the return type of the above method.
b) Add another method to this class call quantity. This method will get a float number like 5.6 and return a float. The method calculate F(5.6).
c) Add another method to this class call derivative which calculate the derivative of entered F(x) and prints it. The derivative would be another polynomial.
d) The use the quantity method again to calculate the value of the derivative for an arbitrary number.