**MS DS Questionnaire**

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Programming Challenge Question:  
  
Write a program that reads in 2 numbers, call them n and m. Compute the nth Fibonicci number and the mth Fibonacci number and then find the greatest common factor of those two numbers. For example, if I typed in 11 and 16, the answer would be 5. The 11th Fibonacci number is 55 and the 16th one is 610. The greatest common factor is 5. You should ensure the user types in a positive number and ask again if the user doesn't.

**//data science application programming excercise**

**//UWM Masters Science in data science**

**//Daniel Forero**

**//input two numbers (m and n)**

**//find mth Fibonacci number**

**//find the nth Fibonacci number**

**//get greatest common factor between the two Fibonacci numbers**

**// set up**

**var m;**

**var n;**

**var gcf;**

**const readInput = require("readline");**

**const enterNum = readInput.createInterface({**

**input: process.stdin,**

**output: process.stdout**

**});**

**//Enter the two integers**

**console.log('Please enter two integers');**

**enterNum.question('enter the first integer ? ', function(numM) {**

**enterNum.question('enter the second integer ? ', function(numN) {**

**//get the Fibonacci numbers**

**m = getFibonacci(numM);**

**n = getFibonacci(numN);**

**console.log(`The ${numM}th Fibonacci number is ${m}`);**

**console.log(`The ${numN}th Fibonacci number is ${n}`);**

**//Find the greatest common factor between the two Fibonacci numbers**

**gcf = findGCF(m,n);**

**console.log(`The greatest common factor between ${m} and ${n} is ${gcf}`);**

**enterNum.close();**

**})});**

**//close up**

**enterNum.on("close", function() {**

**console.log('\nBYE BYE !!!');**

**process.exit(0);**

**});**

**//function to find the correct number in the Fibonacci sequence**

**function getFibonacci(x) {**

**//create array with the first two Fibonacci numbers**

**let arr = [0, 1];**

**//Handle if one of the first two Fibonacci numbers**

**if (x <= 2) return 1;**

**//loop through building the Fibonacci array**

**for (let i = 2; i < x; i++) {**

**arr[i] = arr[i - 1] + arr[i - 2];**

**}**

**//Return the last Fibonacci calculated**

**return arr[x - 1];**

**};**

**//Function to find the greatest common factor**

**function findGCF(number1,number2) {**

**//loop through from 1 until the higher of the two numbers**

**for (let i = 1; i <= number1 && i <= number2; i++) {**

**// check if is factor of both integers using Modulus operator**

**if( number1 % i == 0 && number2 % i == 0) {**

**inGCF = i;**

**}**

**}**

**return inGCF;**

**};**

Please provide solution as well!

PS C:\Users\for9606\documents\javascript\msds> node fibonacci.js

Please enter two integers

enter the first integer ? 11

enter the second integer ? 16

The 11th Fibonacci number is 55

The 16th Fibonacci number is 610

The greatest common factor between 55 and 610 is 5

BYE BYE !!!

PS C:\Users\for9606\documents\javascript\msds>

Statistics Challenge question

You are examining if people like Coke or Pepsi equally. The p-value came out to be .03. Interpret this number (and explain as clearly as you could without using the statistical jargon). Will your interpretation be any different if the p-value had been .06 instead of .03? Please explain. What are all the null and alternative hypotheses in this case?

Please provide the solution as well

The null hypothesis is the question “Do people like Coke and Pepsi equally”. This is what we are trying to prove.

The *p*-value helps us evaluate the results of the testing of the hypothesis.

A *p*-value < 0.5 usually means you reject the null hypothesis, so with the *p*-value of 0.3 we would reject the null hypothesis, or in other words people do not favor code and pepsi equally. It would seem people prefer one or the other.

Had the *p*-value been 0.6 then we would fail to reject the hypothesis, which means we could not find statistical significant differences between people’s choice of coke or pepsi.

The alternative hypothesis is simply the opposite of what we are trying to prove (the null hypothesis). So in this case the alternative hypothesis is simple “People do not like coke and pepsi equally”, or that they prefer one over the other.

Database Challenge Question:  
  
Let's say you have a customer table and an orders table where a customer can have many orders. Could you write a SQL query to return the top five customer names based on the dollar amount ordered? You can assume the tables have reasonable columns like customerFirstName, customerID, orderCost, etc.

Select top 5 Cust.custNo as CustNumber, Cust.FullName as CustName, Sum(Ord.CustOrderAmt) as TotalAmount

From CustomerTbl Cust, OrderTbl ord

Where Cust.custNo = ord.custNo

Order by TotalAmount DESC