

Assignment 11
(Full Score: 60 points)

(Due in class on 3/25/Friday)

Your name:	Score:
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Recursion Projects

1. Modify the Tower of Hanoi sample code in the textbook such that it will
 - record the total number of disk moves (*numMoves*) given the number of disks (*N*);
 - record the time (*mTime*, in *seconds*) for the simulation (running time) of the movements for each *N*.

Test your code with different *N* (from 1, 2, ... to a *relativeLargeN*). For each run, record *N*, *numMoves*, and *mTime* in a table (saved in a Word/PDF file for submission). The largest number for *N*, that is, *relativeLargeN*, should be chosen such that *mTime* ≥ 5 minutes (300 seconds)—you must test with at least **8** different *N*'s!

2. This project is exactly same as the above one (Project 1) **except** that you must delete the line of code for printing out movement (i.e., the *System.out.println(...)* in method *moveOneDisk()*). All the other requirements will the same. Now record your testing results and construct the table.

3. Design and implement a program that implements Euclid's algorithm for finding the greatest common divisor of two positive integers. The greatest common divisor is the largest integer that divides both values without producing a remainder. In a class called *DivisorCalc*, define a static method called *gcd* that accepts two integers *n1* and *n2*. Create a driver to test your implementation (the *output* should look like "*The gcd of 6 and 12 is 6.*"). The recursive algorithm is defined as follows:

```
gcd(n1, n2) is n2 if n2 <= n1 and n2 divides n1
gcd(n1, n2) is gcd(n2, n1) if n1 < n2
gcd(n1, n2) is gcd(n2, n1%n2) otherwise
```

Submissions:

- Create a subfolder for each of the project, and copy all the 3 subfolders into a folder named "assignment11" (including the reports).
- Compress folder "assignment11" including the **Report** and **javadoc file** into a single compressed ZIP file and submit it at Moodle by due time.
- (Your code must follow Java Code/Javadoc Convention (30% of the credits.))