5800

9. 8

Estimate Big-O for the following function

Dijkstra’s Algorithm O(V2)

Bubble sort O (n2)

Insertion sort O (n2)

Merge sort O ( n log n ) recursion and divide

DPS O(V)

Insertion sort vs. Merge sort

Which is better?

Depends on the magnitude of the data set.

Big O : <=

Big omiga : >=

Big theta : =

f = theta(g) means f = O(g) and f = omiga(g)

f(n) = 100n + logn. G(n) = n + (logn)2

9. 15

How to approach a problem?

How do I get ready to code?

What do I do? You decide how to do it.

How to figure out what to code? Meet your customers’ demands. (Time efficiency, Space efficiency -> Algorithms)

Basic Addition. Binary Addition

Binary multiplication

Factoring is hard. How to determine the prime factors of a number?

Primality. How to determine whether or not a number is a prime

1. Simple but fast: check all the integers from 2 to n/2.
2. Sieve of Eratosthenes.
3. Randomized algorithm.

Divide and Conquer (Break problems and see smaller versions of the problem. Solve them one by one Reassemble them.

Merge sort.

How to use Gauss’s method for non-complex numbers?

T(n) = 4T(n/2) + O(n)