

Project 1

CS325 — Spring 2015

by Group 2

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1 Theoretical Run-time Analysis

1.1 Algorithm 1

%% ENTER PSEUDO-CODE HERE %%

Asymptotic Analysis

We have $O(n^2)$ pairs * $O(n)$ time to compute each sum = $O(n^3)$.

1.2 Algorithm 2

%% ENTER PSEUDO-CODE HERE %%

Asymptotic Analysis

We have $O(n)$ i-iterations (outer loop) * $O(n)$ j-iterations (inner loop) * $O(n)$ for the time to update = $O(n^2)$.

1.3 Algorithm 3

%% ENTER PSEUDO-CODE HERE %%

Asymptotic Analysis

We have $T(n) = 2T(\frac{n}{2}) + \Theta(n)$. This falls within Case 2 of the Master Method, and therefore yields a solution of $\Theta(n \lg n)$.

1.4 Algorithm 4

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Asymptotic Analysis

We have $O(n)$ things to compute, therefore this takes $O(n)$ time.

2 Proof of Correctness: Algorithm 3

3 Testing

4 Experimental Analysis

5 Extrapolation and interpretation