**95-771 – Data Structures and Algorithms for Information Processing**

**Homework #2**

Name: Yiqi Zhou

AndrewID: yiqizhou

**Recursion:**

Value Time in seconds (approximately)

P(2, 3) = \_\_0.6875\_\_\_ \_\_\_\_\_\_\_0\_\_\_\_\_\_\_

P(4, 7) = \_\_0. 8281\_\_\_ \_\_\_\_\_\_\_0\_\_\_\_\_\_\_

P(7, 6) = \_\_\_0.387\_\_\_ \_\_\_\_0.000001\_\_\_\_

P(10, 12) = \_0.6682\_\_ \_\_\_\_0.000007\_\_\_\_

P(20, 23) = \_\_\_?\_\_\_ \_\_\_\_\_\_\_?\_\_\_\_\_\_\_

P(30, 15) = \_\_\_?\_\_\_ \_\_\_\_\_\_\_?\_\_\_\_\_\_\_

P(50, 40) = \_\_\_\_?\_\_\_ \_\_\_\_\_\_\_?\_\_\_\_\_\_\_

**Dynamic Programming:**

Value Time in seconds (approximately)

P(2, 3) = \_\_0.6875\_\_\_ \_\_\_\_\_\_\_0\_\_\_\_\_\_\_

P(4, 7) = \_\_0. 8281\_\_\_ \_\_\_\_\_\_\_0\_\_\_\_\_\_\_

P(7, 6) = \_\_\_0.387\_\_\_ \_\_\_\_\_\_\_0\_\_\_\_\_\_\_

P(10, 12) = \_0.6682\_\_ \_\_\_\_\_\_\_0\_\_\_\_\_\_\_

P(20, 23) = \_0.6780\_\_\_ \_\_\_\_\_\_\_0\_\_\_\_\_\_\_

P(30, 15) = \_0.0113\_\_\_ \_\_\_\_\_\_\_0\_\_\_\_\_\_\_

P(50, 40) = \_0.1445\_\_\_ \_\_\_\_0.000001\_\_\_\_

**We computed P in two ways – by using recursion and by dynamic programming. Which of these was faster and why?**

During recursion, there may exist cases where same sub-problems are solved multiple times.

However, during dynamic programming, the result of all sub-problems are cached for future use.