CSC 373: Week 4 Tutorial

- Assignment 1 deadline has been extended to tomorrow Friday June 9th, 11:59pm
- This room(SS2118) will be our tutorial room from this week on
- Exam 1 next Thursday, June 15th

Example 1

Given: an array of m distinct natural numbers, $A[1], \dots, A[m]$
a natural number N

Find: the number of distinct sets from the array that sum up to N, with duplicates

$\{1, 20, 40\}\ N = 22$
$1, 1, 20 \quad 1, 20, 1 \quad 20, 1, 1 \quad 1, 1, 20 \quad 1, 1, 1, 1, \dots, 1$

l of length $N + 1$
$l[0], \dots, l[N]$
Want: $l[i]$ is the number of sets that add up to i
initially all 0
$l[0] \ = 1$
$l[i]$ and $l[0]$ … $l[i-1]$
for $i = 1, \dots, N$
    for $j = 1, \dots, M$
        if $A[j] \leq i$
            $l[i] \mathrel{+}= l\left[i - A[j]\right]$
return $l[N]$

$l[0] = 1$
$l[1] = 1$
$l[2] = 1$
$\vdots$
$l[19] = 1$
$l[20] = 1 + 1 = 2$
$l[21] = 2 + 1 = 3$
$l[22] = 3 + 1 = 4$

$l[20] = l[19] + l[0]$
$\quad\quad\quad\ \uparrow \quad\ \uparrow$
$\quad\quad\quad$ 20-1 $\quad$ 20-20
$l[21] = l[20] + l[1]$

16 – 5

Caching | 2 3 17 4 1 10 1 10 |

N ↑ ↑

cache of size k

initially empty

cache miss

| 17 1|

evict

↓ ↓ ↓ ↓ ↓ ↓

| 1 2 2 1 3 3 1 2|

$k = 2$ | 1 2 | 3

20 1 20 20 1 1 1

Furthest in future

OPT list of evictions

| 1 2| × ×

| |1| |

| 2 1| ×

| |2| |

| 1 2 |

↑