

Homework Assignment 2

Tyler Paulley

9/17/2016

Problem 1:

- a)
 - i) n
 - ii) addition
 - iii) no
- b.
 - i) the size of n
 - ii) multiplication
 - iii) no
- c.
 - i) n
 - ii) comparison of two numbers
 - iii) no
- d.
 - i) the sum of the two numbers
 - ii) modulo division
 - iii) yes
- e.
 - i) the size of n
 - ii) removing numbers from a list
 - iii) no
- f.
 - i) n
 - ii) multiplication of two digits
 - iii) no

Problem 2:

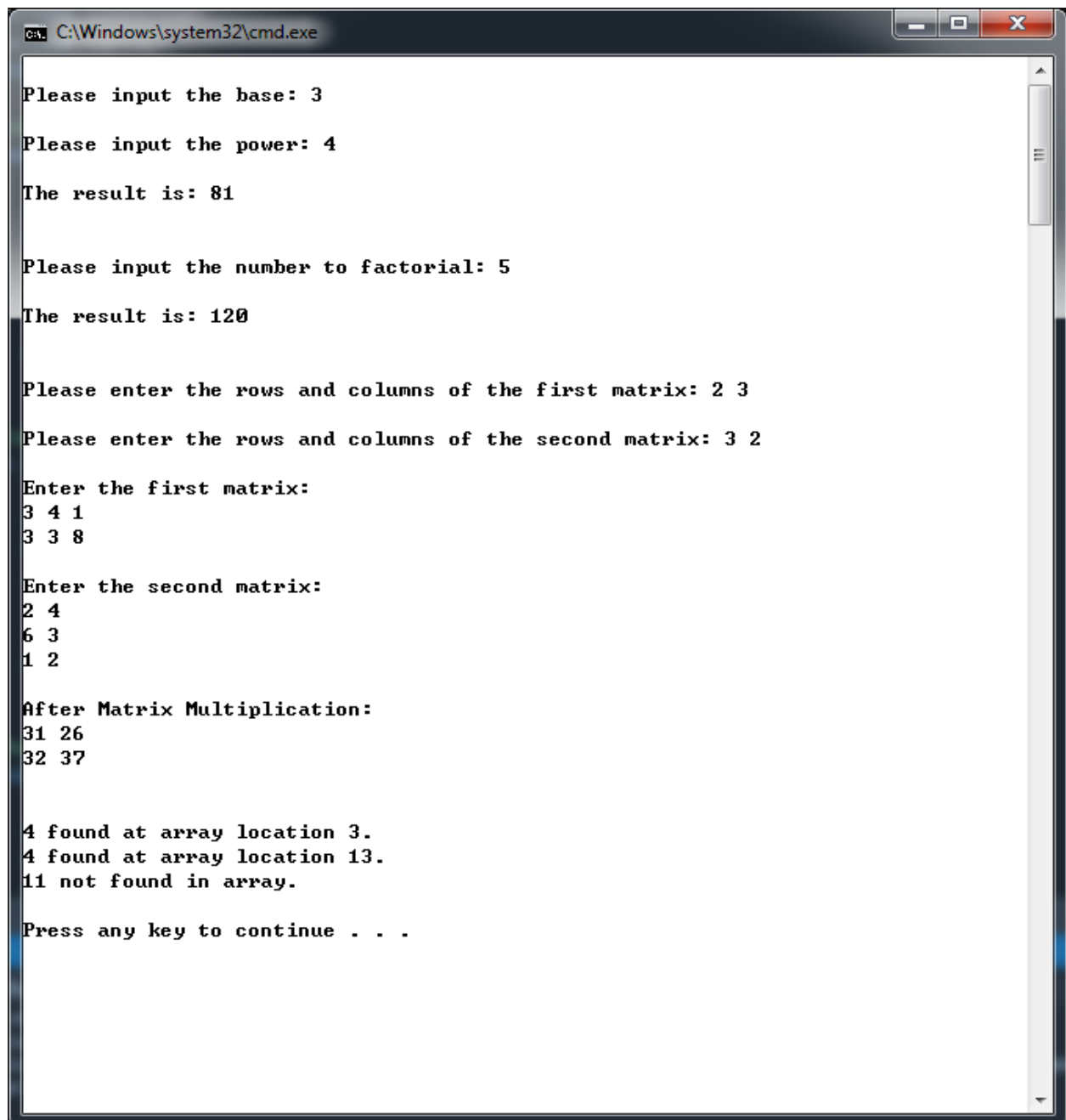
- a) 2 times greater
- b) 2 times greater
- c) 4 times greater
- d) 16 times greater
- e) 64 times greater
- f) $(2^n)^3$ times greater

Problem 3:

- a) $n(n + 1)$ and $2000n^2$: Same order of growth
- b) $100n^2$ and $0.01n^3$: The first has a lower order of growth than the second
- c) $\log_2 n$ and $\ln n$: Same order of growth
- d) $\log_2^2 n$ and $\log_2 n^2$: The first has a higher order of growth than the second
- e) 2^{n-1} and 2^n : Same order of growth
- f) $(n - 1)!$ and $n!$: First has a lower order of growth than the second

Brute Force Coding:

- 1) Computing a^n ($a > 0$, n is a nonnegative integer)
- 2) Computing $n!$
- 3) Multiplying two matrices
- 4) Searching for a key of a given value in a list



```
C:\Windows\system32\cmd.exe

Please input the base: 3
Please input the power: 4
The result is: 81

Please input the number to factorial: 5
The result is: 120

Please enter the rows and columns of the first matrix: 2 3
Please enter the rows and columns of the second matrix: 3 2
Enter the first matrix:
3 4 1
3 3 8

Enter the second matrix:
2 4
6 3
1 2

After Matrix Multiplication:
31 26
32 37

4 found at array location 3.
4 found at array location 13.
11 not found in array.

Press any key to continue . . .
```