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| **15-110 Recitation 03** |

# **Recap**

* Big O and Complexity
* Tractability, P v. NP
* Topics Review

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# **Reminders**

* Hw 4 due tomorrow Friday 10/30 @ Noon EDT
	+ **Complete midsemester surveys for bonus points!**
* Test 4 next Friday 11/06
	+ Small Group Test review sessions

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| Problems |

# **BIG O REVIEW**

**Quick Questions:**

1. What does the Big O of a function represent?

Answer

1. What is a common feature of O(n^2) functions?

Answer

1. What is an example of an O(2^n) function, and how do we know?

Answer

**Calculate the Big-O for the following functions:**

**TIP: Calculate the Big O of each line, then perform the relevant multiplications and additions to calculate the total function Big O!**

def foo(s): #s is a string of length n

 for elem in s:

 for vowel in “aeiou”:

 if elem == vowel:

 print(“Found a vowel!”)

Answer:

def bar(L): #L is a list of length n

 total = 0

 for elem in L:

 L[0] += elem

 L.sort() #sort() is O(nlogn)

 total += L.count(elem) #count() is O(n)

 return total

Answer

# **TRACTABILITY & P VS. NP**

**Notes:**

Tractability – . . .

Tractable – . . .

Intractable – . . .

P – . . .

NP – . . .

**Quick True/False Questions:**

Some intractable problems are in P

All problems in P are in NP

If we find a tractable solution to exam scheduling, then P = NP

The Travelling Salesman Problem is in NP

# **Topics Review**

**Notes:**

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