

CS21: INTRODUCTION TO COMPUTER SCIENCE

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Swarthmore College

Outline Nov 5:

- Linear Search (linear_search.py)
- Runtime analysis (introduction to big-O)

Notes

- I will finish TDD reviews by the start of lab this week
- Make sure to copy (**cp**) your design into a new file!

Linear Search

W+ics lunch

Sharples

outside

Rm 208

12-1pm

Today: linear
search

wed/Fri: binary
search

Next week:

Sorting!

Motivation for searching

data = [webpage1, webpage2, ...]

query = "internship in CS"

* "complex relationship between data and query"

data = [7, 10, 3, 2, 8, 3, 0]

query1 = 3

query2 = 11

Id

← index

* re

* w



en

5
3, 0] ⁶ ← index

Idea 1: use "in" operator
→ query in data → returns boolean

* return a boolean

def linear_search(q, lst):

found = False for or while loop
⋮

return True
found = True

flag method

return False
(found)

Idea 2: return index

↳ index of first occurrence

def linear_search_index(q, lst):

for or while loop

⋮

return i

return -1

item was
not found

Runtime

1st):

$n = \#$ of elements we are searching through

example

$n = 7$

worst case runtime:

n steps: $O(n)$

↑
"order"

was found

