

# CS21: INTRODUCTION TO COMPUTER SCIENCE

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Fall 2017

Swarthmore College

# Outline Nov 17:

- Quiz 4: first 25-30min
- Recap sorting from last time
- Insertion Sort demo
- Runtimes in action
- Can we create a faster sorting algorithm?

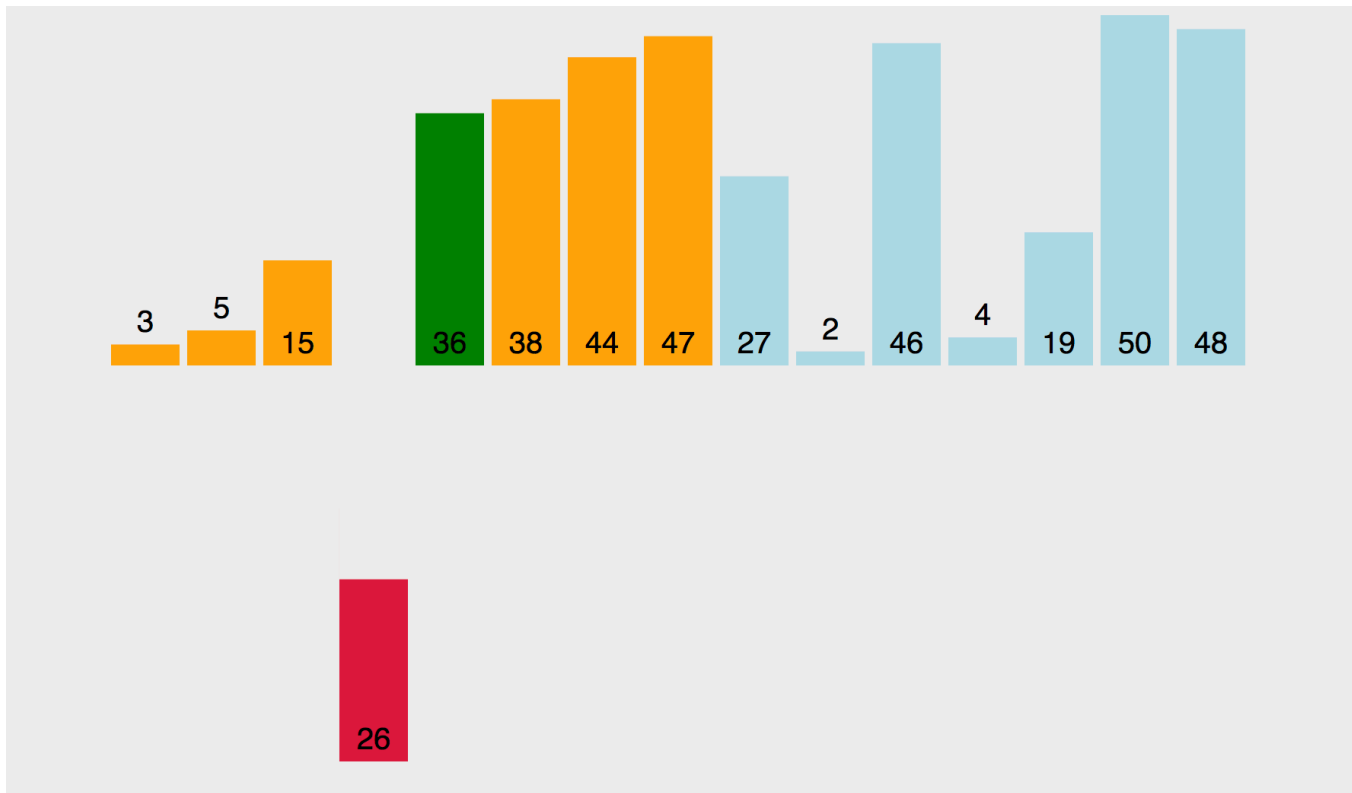
## Notes

- Lab 8 due **tomorrow** night!
- Office hours **today** 3-5pm (in lab 240)
- Lab 9 posted, due Mon after Thanksgiving

# Sorting

# Insertion Sort demo

- <https://visualgo.net/bn/sorting>



# Runtime Comparison demo

- <http://sorting-algorithms.com/>

 Play All	 Insertion	 Selection	 Bubble	 Shell	 Merge	 Heap	 Quick	 Quick3
 Random								
 Nearly Sorted								
 Reversed								
 Few Unique								

# Runtime in action

- `/cs21/inclass/week10/sort_runtime.py`
- Idea: if we double the length of the list, we should see the runtime quadruple (x4)

# Can we do better than $O(n^2)$ ?

- Idea: thinking along the lines of binary search, what if we could divide the list in half and sort both pieces, then merge them together?