

CS 305  
Design and Analysis of Algorithms

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Instructor: Michael Eckmann

# Today's Topics

- Questions / Comments?
- Finish Analyzing radix sort
- Bucket sort
- Analyze bucket sort
- --- what have we learned in the course so far?
- Recursive Change Making algorithm
- Analyze it
- Memoization
- Analyze the memoized change making algorithm

# We learned the following so far

- Asymptotics
  - Can compare algorithm speed when  $n$  is large
  - Care about constants though when  $n$  is small
- Many sorting algorithms
  - MergeSort, QuickSort, CountingSort, RadixSort, BucketSort
  - Analyzed those and InsertionSort, SelectionSort
  - Comparison sorts require  $\Omega(n \lg n)$  compares in worst case
- Recurrence relations
  - Recursion tree solution method
  - Master Method
- Some probability, Three Series (Arithmetic, Geometric, and Harmonic), Proof by Induction