# CS210
# Discussion

Week 7

UMass Boston

# Project 3 – Comparisons

- Comparisons
  - Comparable
  - Comparator
- Binary Search

- Term
- Binary Search Deluxe
- Autocomplete

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# Autocomplete

- Constructed from a Terms array
  - Defensive copy
- Provides ‘allMatches()’
  - This is the autocomplete
  - Get all strings starting with a given prefix
  - Results ordered by weight
- Provides ‘numberOfMatches()’

```
$ java Autocomplete data/wiktionary.txt 5
Enter a prefix (or ctrl-d to quit): love
First 5 matches for "love", in descending order by weight:
  49649600      love
  12014500      loved
  5367370       lovely
  4406690       lover
  3641430       loves
```

P3

# Autocomplete

- Performance requirements
  - Constructor ~ nlog(n)
  - allMatches ~ log(n) + mlog(m)
  - numberOfMatches ~ log(n)
- Related to the runtime of Binary Search and sorting
- n is the number of terms you can search from and m is the number of terms matching your search

# Questions about the third problem?

# Point3D

- A data type to represent a point in 3D space
  - (x, y, z)
- Similar to Location and Die
- Alternate comparators for each axis

```
$ java Point3D
How many points? 3
Enter 9 doubles, separated by whitespace: -3 1 6 0 5 8 -5 -7 -3
Here are the points in the order entered:
  (-3.0, 1.0, 6.0)
  (0.0, 5.0, 8.0)
  (-5.0, -7.0, -3.0)
Sorted by their natural ordering (compareTo)
  (-3.0, 1.0, 6.0)
  (-5.0, -7.0, -3.0)
  (0.0, 5.0, 8.0)
Sorted by their x coordinate (xOrder)
  (-5.0, -7.0, -3.0)
  (-3.0, 1.0, 6.0)
  (0.0, 5.0, 8.0)
Sorted by their y coordinate (yOrder)
  (-5.0, -7.0, -3.0)
  (-3.0, 1.0, 6.0)
  (0.0, 5.0, 8.0)
Sorted by their z coordinate (zOrder)
  (-5.0, -7.0, -3.0)
  (-3.0, 1.0, 6.0)
  (0.0, 5.0, 8.0)
```

# Questions?

# Practice Programming Exam

- Go to the ”Resources” section of the course website
- Click on Programming Sample Exam 1
- Work on the exam for 30 minutes
  - We’ll answer questions as if it were a real exam
- Then we’ll go over it together

# Questions?