Announcements/Reminders:

- HW4 assigned
- HW2, P1 graded. HW2 solutions link on Piazza.
- Midterm syllabus
- Late submission of HW2

Last class:

- Recursion (begin)

Today:

- Recursion (cont'd)
Recursion Recap

Definition:

Key Rules:

1.

2.

Questions to keep in mind

– How can you solve the problem in terms of smaller problems of the same kind?
– What instances of the problem can be used as base cases?
– How does the problem size decrease in each recursive call?
– As the problem size decreases will a base case be reached?
Recursion Example: n choose k

Conventional Definition:

Recursive Definition:

Implementing the recursive definition:

Tracing an execution tree:
Recursion Examples: Arrays and Linked Lists

```java
int countEven(int[] a):

boolean isIncreasing(ListNode<Integer> head):
```
Tail Recursion

http://www.xkcd.com/1270/
Analyzing Complexity of Recursive Methods
Recursion Example: Binary Search
Recursion Example: Palindromes

Write a recursive method to determine if a given input String is a palindrome. Palindrome examples:

- eye
- kayak
- racecar
- Was it a rat I saw?
- Never odd or even!
- Amy, must I jujitsu my ma?
- Are we not drawn onward to new era?

Assume: input String is not null, all spaces and punctuation removed, all lowercase.

Useful String methods:

- char charAt(int index)
- int length()
- String substring(int begin, int end)