61A Extra Lecture 2
Announcements

cs61a.org/extra.html
Dice
Exact Chances for Rolling Dice

roll_dice(2, six_sided)

roll_dice(10, six_sided)

(Demo)
What is the chance that I'll score at least $k$ points rolling $n$ six-sided dice?

(Demo)

$S_n$ : Score from rolling $n$ dice

$t$ : A single outcome of rolling once

$P(S_n \geq k) = \sum_{t=2}^{6} P(t) \cdot P(S_{n-1} \geq k - t)$

(assuming no Pig Out!)
Memoization

(Demo)
Fill out bit.ly/61ahere
Twenty-One (Nim)

(Demo)
Twenty-One Rules

Two players alternate turns, on which they can add 1, 2, or 3 to the current total.

The total starts at 0.

The game ends whenever the total is 21 or more.

The last player to add to the total loses.

(Demo)

Some states are good; some are bad.

(Demo)
Hog Optimal Strategies
Contest Challenges

Larger state space than Nim & random transition function

Spring 2015 Optimal Strategy

• Rules: [http://inst.eecs.berkeley.edu/~cs61a/sp15/proj/hog/](http://inst.eecs.berkeley.edu/~cs61a/sp15/proj/hog/)

• Designed for what opponent?

Partial information: your strategy is not a function of the dice being used