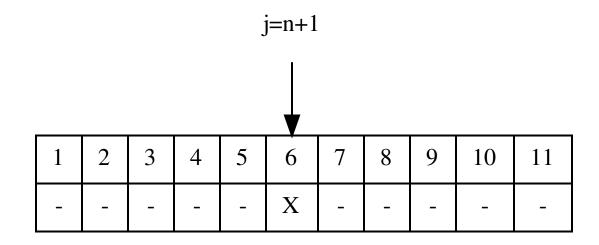
Predictions

September 2011

Question...

How often does the very first step (or, the first edge reached) match the final direction? It depends on the size... what is n?



```
A Single Trial (1)
```

```
j=n+1
#
if random()<0.5: # very first step
    j+=1
else:
    j-=1
#
while 1<=j<=m:</pre>
```

• • •

```
A Single Trial (2)
```

```
veryFirstStep=(j-(n+1))
#
while 1<=j<=m:
    ...
if veryFirstStep== 1 and j==m+1:
    print 'Match!'
if veryFirstStep==-1 and j==0:
    print 'Match!'</pre>
```

Many Trials

Many Sizes

n=1
while n<=25:
 #
 match=0
 ...
 print n,(100.0*match)/numtrials
 #
 n+=1
#</pre>

Write the Results to a File

python first.py > first.txt

...*or* ...

IDLE

- Highlight All and Copy
- Spreadsheet then Paste
- $\bullet \, {\tt Text} \ o \ {\tt Table}$

Gnuplot Script

```
set terminal png
set output "first.png"
set ylabel "Observed Match %"
set yrange[50:100]
plot "first.txt" with linespoints pt 5 notitle
```

...*or* ...

Spreadsheet

First Edge Reached

j=n+1
j=m
while 1<=j<=m:
 if random()<0.5:
 j+=1
 else:
 j-=1
if j==m+1:
 print 'Match!'</pre>

Lab Assignment: Predictions

- Run 10,000 trials for each $n \leq 25$.
- Report the predictive value of the very first step.
 - -Sketch a plot.
 - -What happens as n grows?
- The horizontal axis is n, the size, and the vertical axis is the observed percent of trials where the direction of the very first step matches the final direction of our walk.
- Report the predictive value of the first edge reached, too.
 - -Sketch another plot.
 - Now what happens as n grows?