Monte Carlo simulations

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Lecture 14

Coin flipping bets

Imagine the game where someone spins a coin.
If the coin falls face up (50/50 chance) you get your bet quadrupled, otherwise your bet is taken by another player.

What fraction of your money should you bet each time to get the maximum gain?

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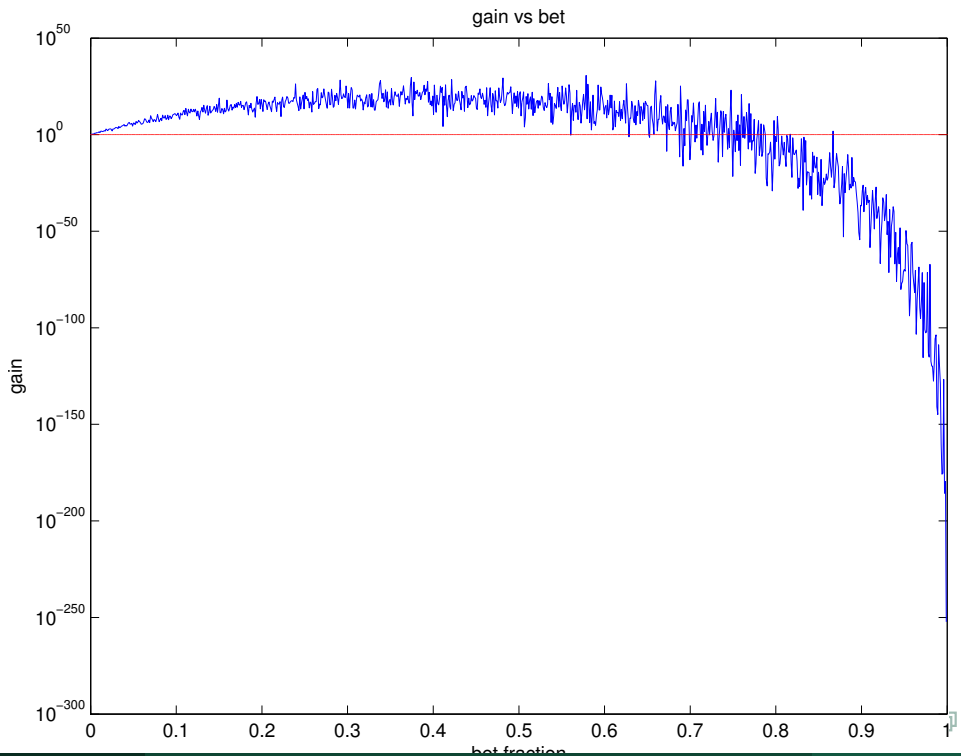

Matlab's `arrayfun`

Often it requires extra effort to program a function which accepts an array
Deliberately bad example

```
x_squared=@(x) x^2;
```

Notice if we send in a non square array we will get an error.
What if we want to apply our function to an array?
We can use loops, but this is bulky and messy code.
Instead we can use `arrayfun`

```
x=[1,2,3,4];
xsq = arrayfun(x_squared, x)
xsq =
     1     4     9    16
```

The Monty Hall Paradox

Suppose you have 'N' doors; behind one of them there is a prize.

1. make your choice
2. host rules out all other doors without prize behind but one
3. now you face 2 doors (one of your choice and the other)
4. behind one of them the prize is located
5. should you change your mind and pick the other door?

Disease spread

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