

Monte Carlo simulations

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Lecture 14

Notes

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.

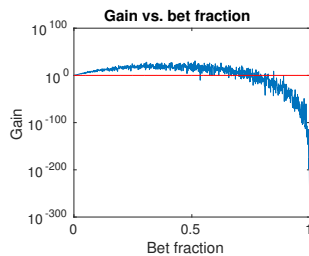
What fraction of your money should you bet each time to get the maximum gain?

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Matlab's arrayfun

It usually requires an extra effort to program a function which accepts an array

Deliberately bad example

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

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
```

Notes

The Monty Hall Paradox

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

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

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Disease spread

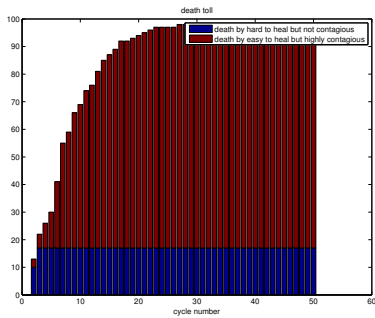
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