

What is Pattern Recognition?

- “The field of pattern recognition is concerned
- with the automatic discovery of regularities in data through the use of computer algorithms and
 - with the use of these regularities to take actions such as classifying the data into different categories”

An Example

- Flip a coin
- Choose a ball
- Call the coin-toss

Flip a Coin



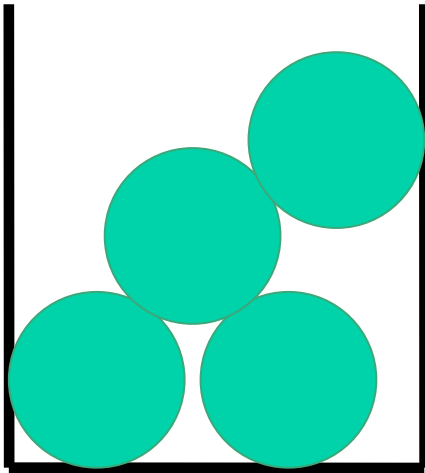
“Head”



“Tail”

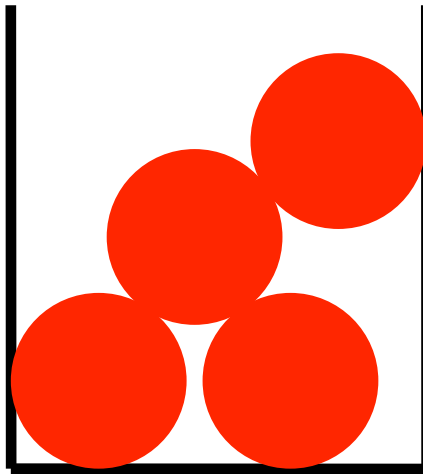
If (coin=="head")

Choose one of these balls:



If (coin=="tail")

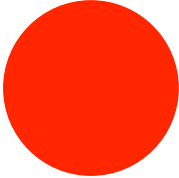
Choose one of these balls:



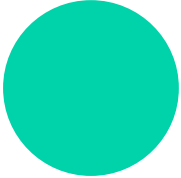
The Challenge

- You cannot see the coin toss outcome
- You can only see the drawn ball
- Given the observation of the drawn ball, decide the outcome of the coin toss

The Challenge

- Give it a try...
- Observe 
- Was it “head” or “tail”?

The Challenge

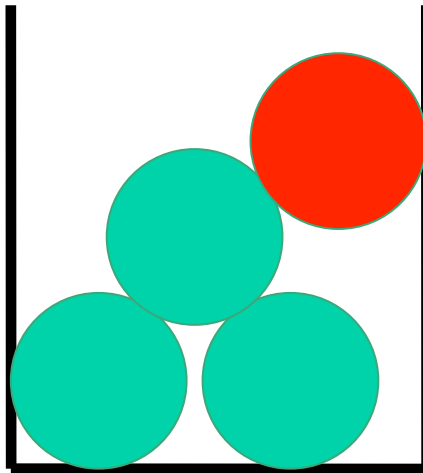
- Another one...
- Observe 
- Was it “head” or “tail”?

The Challenge

- Make it slightly more interesting

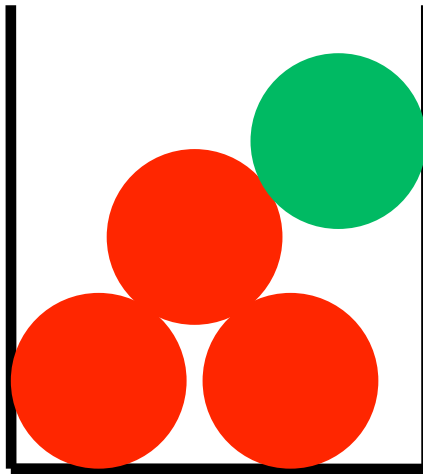
If (coin=="head")

Choose one of these balls:

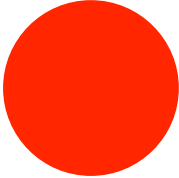


If (coin=="tail")

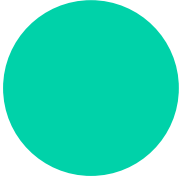
Choose one of these balls:



The Challenge

- Try again...
- Observe 
- Was it “head” or “tail”?

The Challenge

- And again...
- Observe 
- Was it “head” or “tail”?

Keeping Score

- Suppose I pay you \$1 for every correct call, and you pay me \$1 for every incorrect call.
- After, say, 100 calls, how much money do you think you will have?

Optimum Decision

- What is the maximum amount that you can expect to have, given the set up of the game?