

# Rational AIs

Algorithm Approach

Plato and Descartes

# The Theory

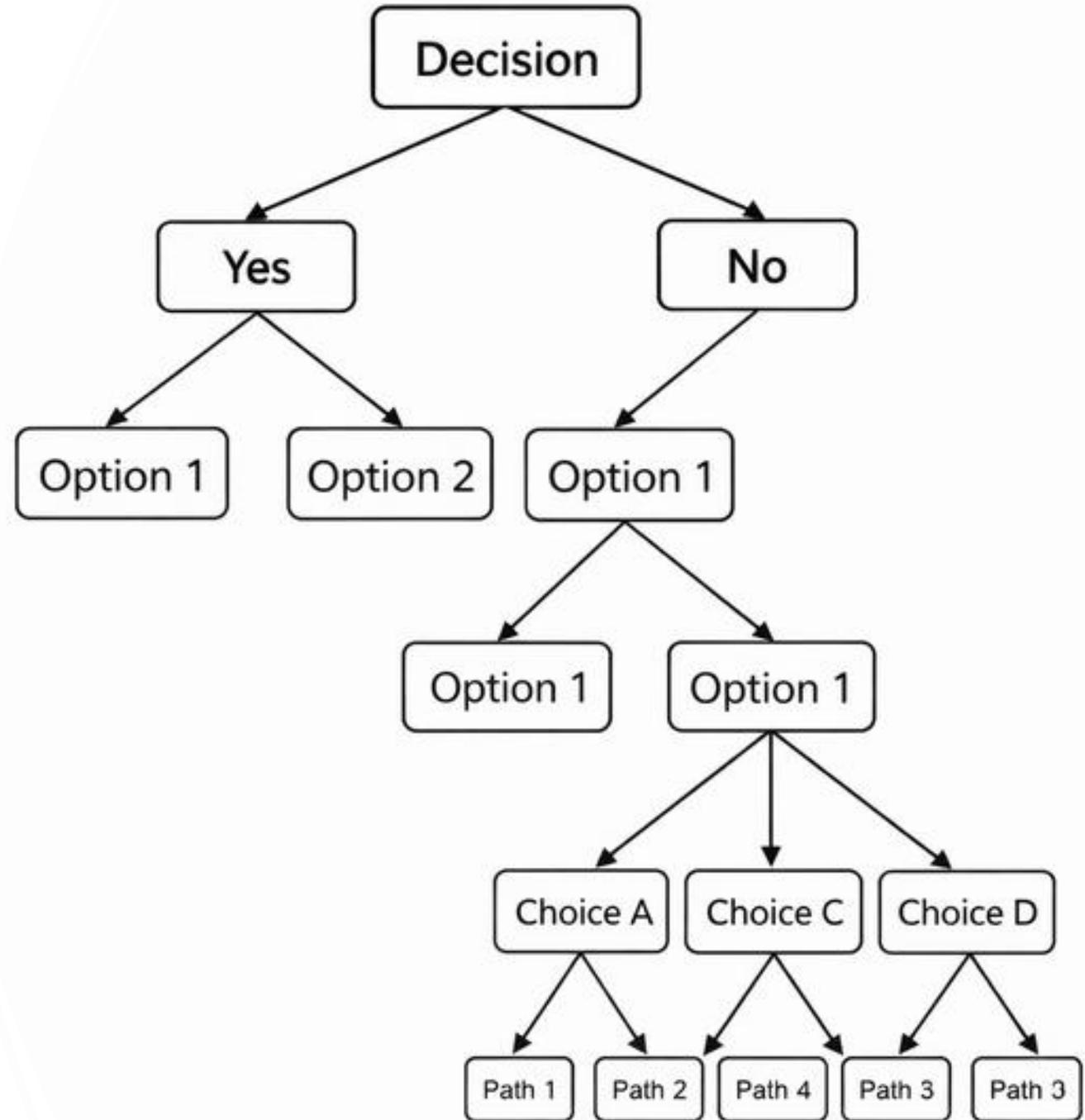
Intelligence may  
be modeled with  
Algorithms

Logic Driven

# Expert Systems

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- Decision Trees
  - Binary
  - Multiple
- Assumptions
  - Known Factors
  - May be defined and weighted
  - Leverage computer speed



Recognize  
these AI's

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Credit Scoring

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Wordle Bot

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Customer Support

# May 1977

## Deep Blue defeats Chess Grand Master

- Relied on search and logic
- Used brute force search – millions of possible positions per second
- Evaluation functions crafted by chess experts
- Goal to maximize chance of winning

## Consider:

- Defined Rules
- Finite space

# February 2011

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IBM Watson defeats Ken Jennings and  
Brad Rutter

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Jeopardy requires nuanced language  
skills

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Deliberately Ambiguous questions

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Very quick time frames

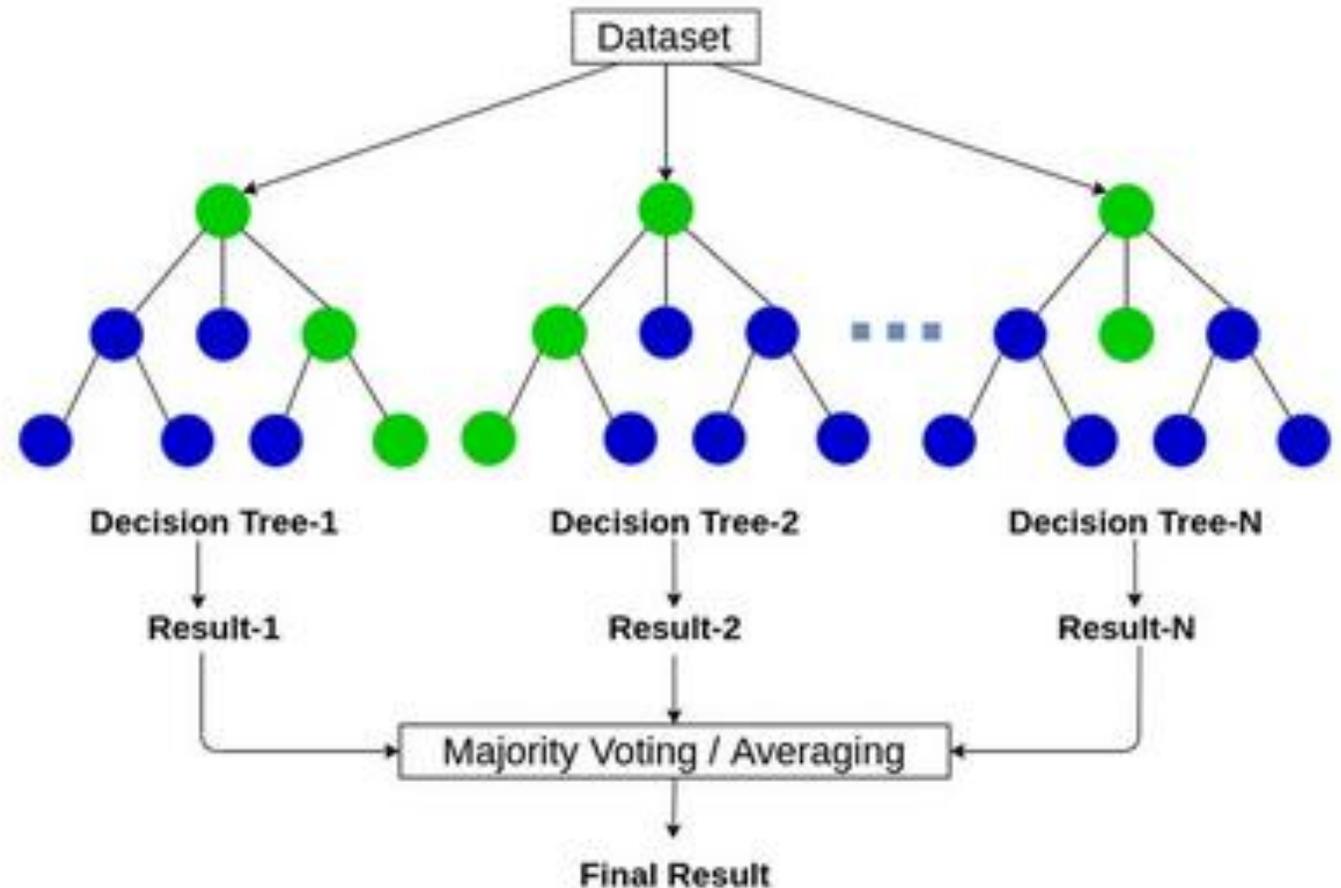
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Risk Management

# A bit more on Rational Models

- Decision Trees / Forests
- Advantages
  - Transparent
  - Explainable
- Disadvantages
  - Increasing Complexity
  - Bias (factor weighting)

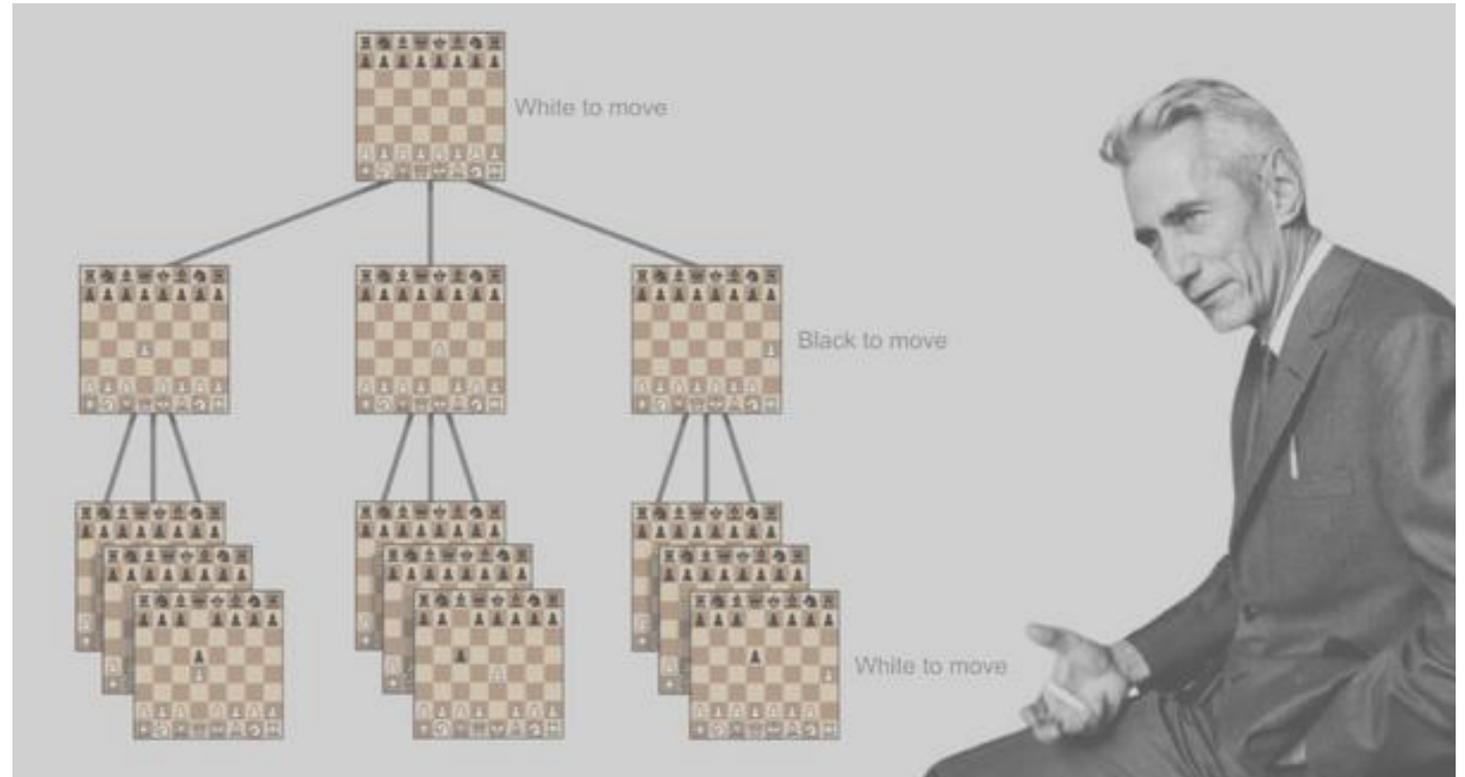
# Random Forest



# Nerd Alert

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- Claude Shannon
  - Information Theory  
October 1948
  - “Hello, Bit”
- Shannon Number
  - The game tree complexity of chess
  - $10^{120}$  possible games
  - $10^{80}$  estimated atoms in universe



# Hello Bit

- One bit represents the amount of information gained when one of two equally likely possibilities is realized.

# AI Winters



Enthusiasm Fades / Investments Fail / Capital Leaves

IBM Watson introduced in 2021  
Discontinued in 2022

## Different Approaches

Build an  
Adult Brain.

Build a  
Baby Brain.

# Transition

How did you  
teach your  
children?

How did you  
train your  
dog?

Let's  
Unweave  
Further

