

# CS/INFO 4154:

## Analytics-driven Game Design

Class 24:

Balance

Mon

Wed

Fri

---

10/20

10/23

10/25

10/27  
Friends Release

# Friends Release

---

- Requirements
  - *Smooth progression* of nine\* tasks
  - Tutorials
  - Music
  - Sound
  - Logging

\* Negotiable; “task” definition depends on your game

# Friends Release Report

---

- Due **BEFORE CLASS** by 10:10am on Friday 11/3

# Friends Release Report

---

1. Report the median levels completed and time played.
2. Show burndown charts for both levels completed and time played.
3. What is the biggest problem with engagement?
4. How did you identify this problem with the analytics? (i.e. burndown chart analysis)
5. Where is the problem happening?
  - Visualize this with a spatial heatmap.
6. What proportion of players are affected?
  - Visualize this with a Sankey or state-transition diagram
7. How will you fix the problem?

# Goal

---

- Communicate a *perspective* on game balance
- Set of questions you can use to improve your game

# Outline

---

- What on earth is balance
- Recalling memories of balance
- Balance techniques

# Outline

---

- **What on earth is balance**
- Recalling memories of balance
- Balance techniques

# Language of Balance

---

OP

nerf

imba

broken

rework

buff

qq

underpowered

# Perspectives on Balance

---

“Zerg OP, Toss imba!! So can we nerf terran now?”

- *rockman*

StarCraft 2 Battle.net forums, 11/2013

# Perspectives on Balance

---

“Zerg OP, Toss imba!! So can we nerf terran now?”

**Translation:**

*Zerg and Protoss are too powerful, so why are they reducing the relative power of Terran?*

# Years of Balancing

---



# League of Legends

## Highest Win Rate Champions (9/16/2012 - 9/23/2012)

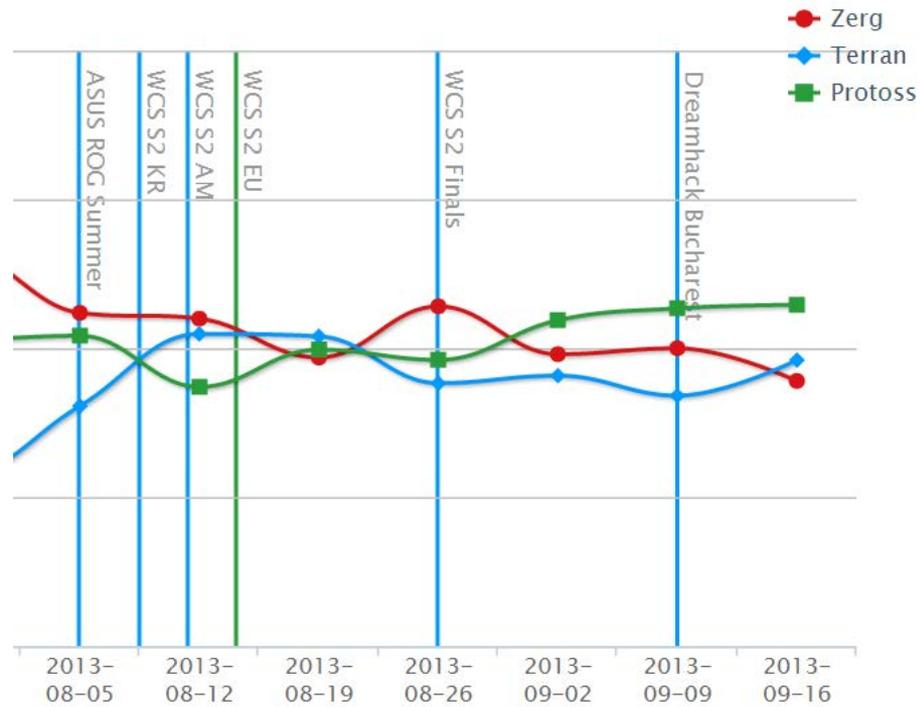
Win Percentage Popularity Percentage

Mouse over elements for details.

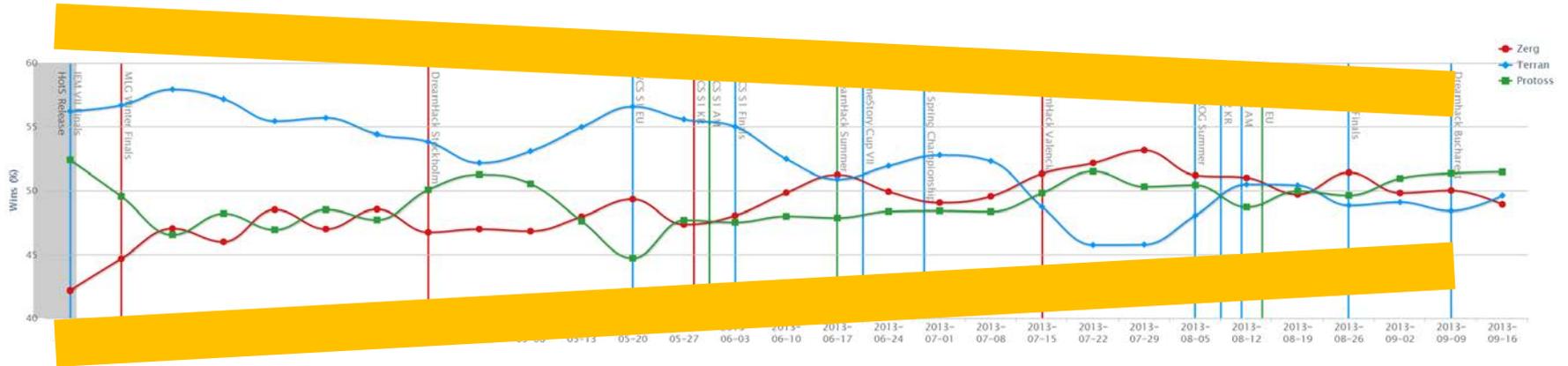


# StarCraft II

---



# StarCraft II



# Case Study: Halo 1

---

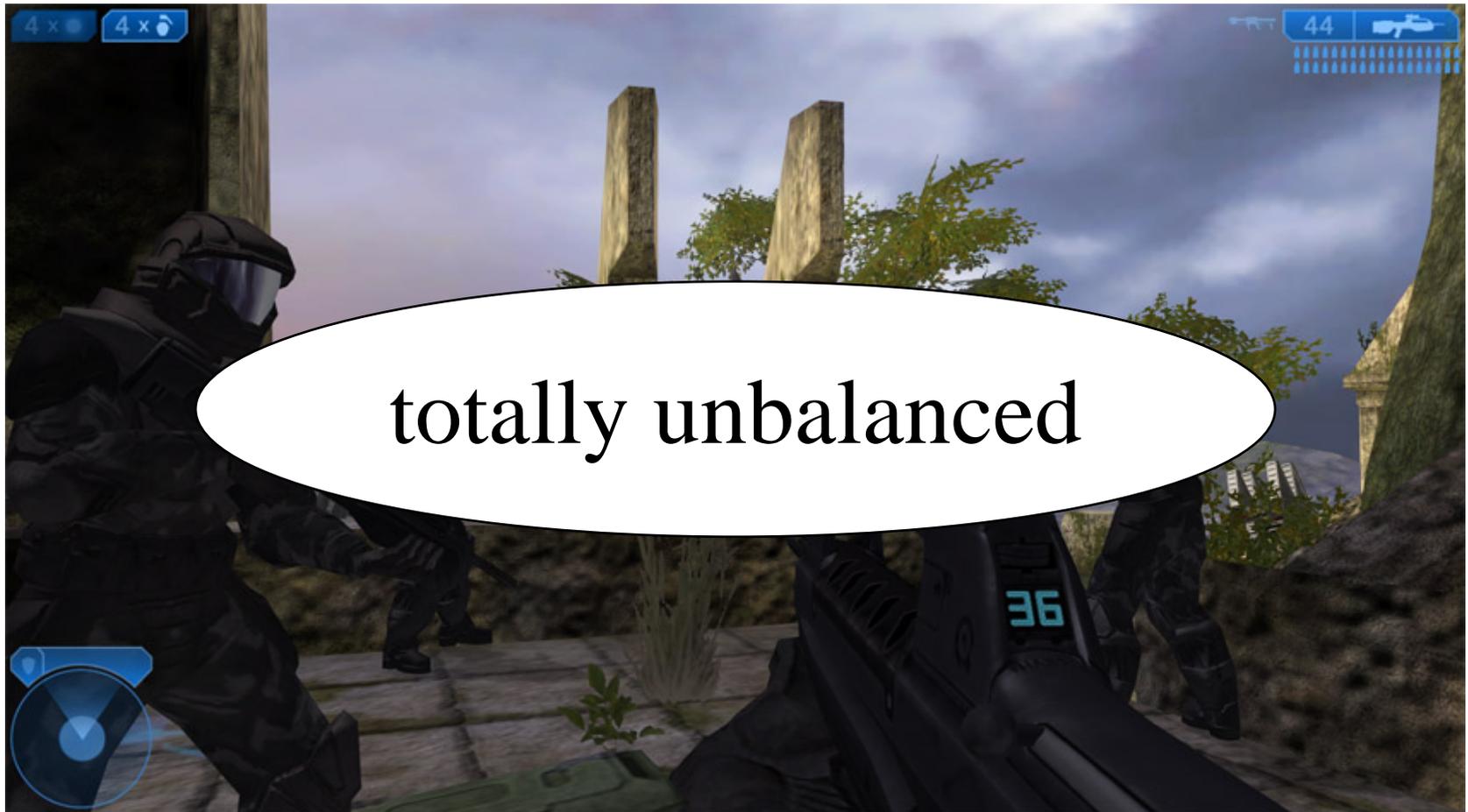


# Halo 1: Overpowered Pistol



# Case Study: Halo 2

---



# Case Study: Halo 3

---



# Halo 3 Balance Interface

---



# Halo 3 Balance Interface

---



# Halo 3 Balance Interface

---



# Why is balance so hard?

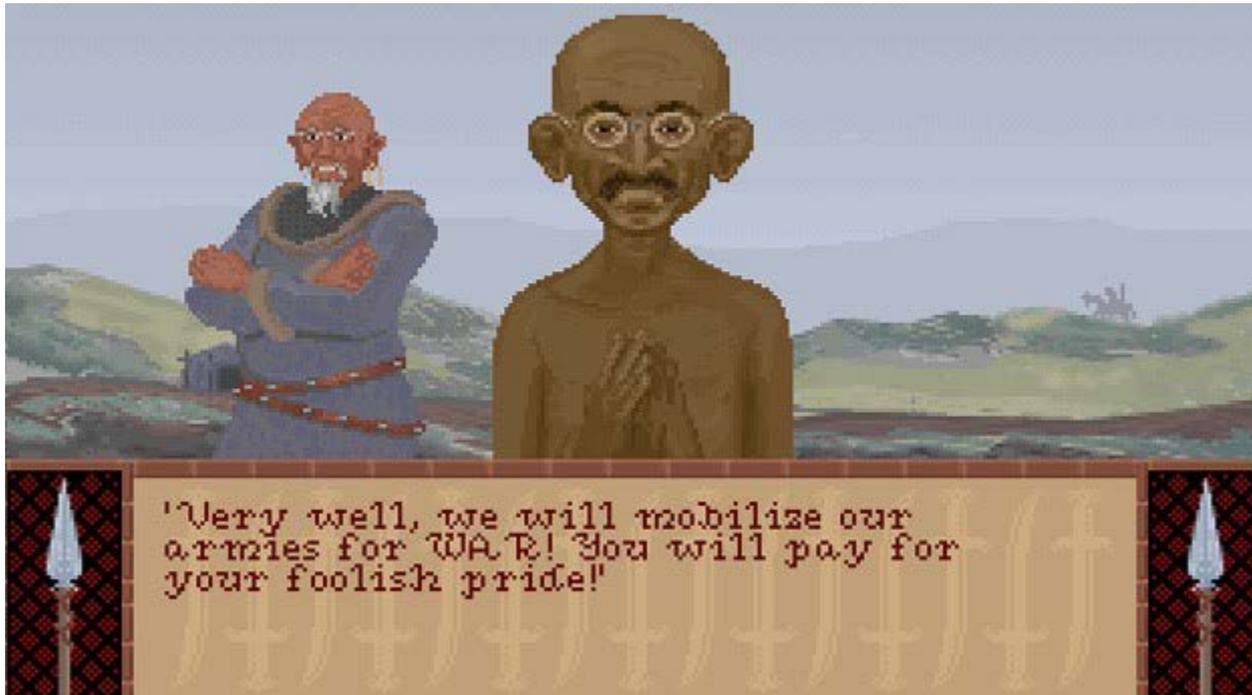
---

- Games are complex interconnected systems
- A small change to one part affects other parts

# Famous Balance Bug: *Civilization*

---

## Overly Aggressive Gandhi



# What is balance?

---

- Narrowest sense:
  - **Fairness**

# Fairness

---

- When I fail, is it:
  - my fault?
  - the game's fault?

# Fairness in competitive games

---





50%



50%



$> 50\%$



$< 50\%$



$< 50\%$



$> 50\%$



52-56%

# Fairness in noncompetitive games

---

- Players struggle against the *environment*

# Outline

---

- What on earth is balance
- **Recalling memories of balance**
- Balance techniques

# Sid Meier: “what is a game?”

---

a series of  
*interesting decisions*

(GDC 2012)

# 5 minutes: pair activity

---

- Pick your favorite game
- **Discuss:**
  - What are the *decisions* you must make in the game?
  - Why are these decisions *interesting*?
  - What characteristics does a game need to have for the *space of decisions* to be interesting?

# What is balance?

---

- Narrowest sense:
  - **Fairness**
- Expanded sense:
  - **Depth**
  - **Variedness**
  - **Interestingness**
- A set of desirable characteristics about the *decision space* of the game

# Outline

---

- What on earth is balance
- Recalling memories of balance
- **Balance techniques**

# Modeling Decision Spaces

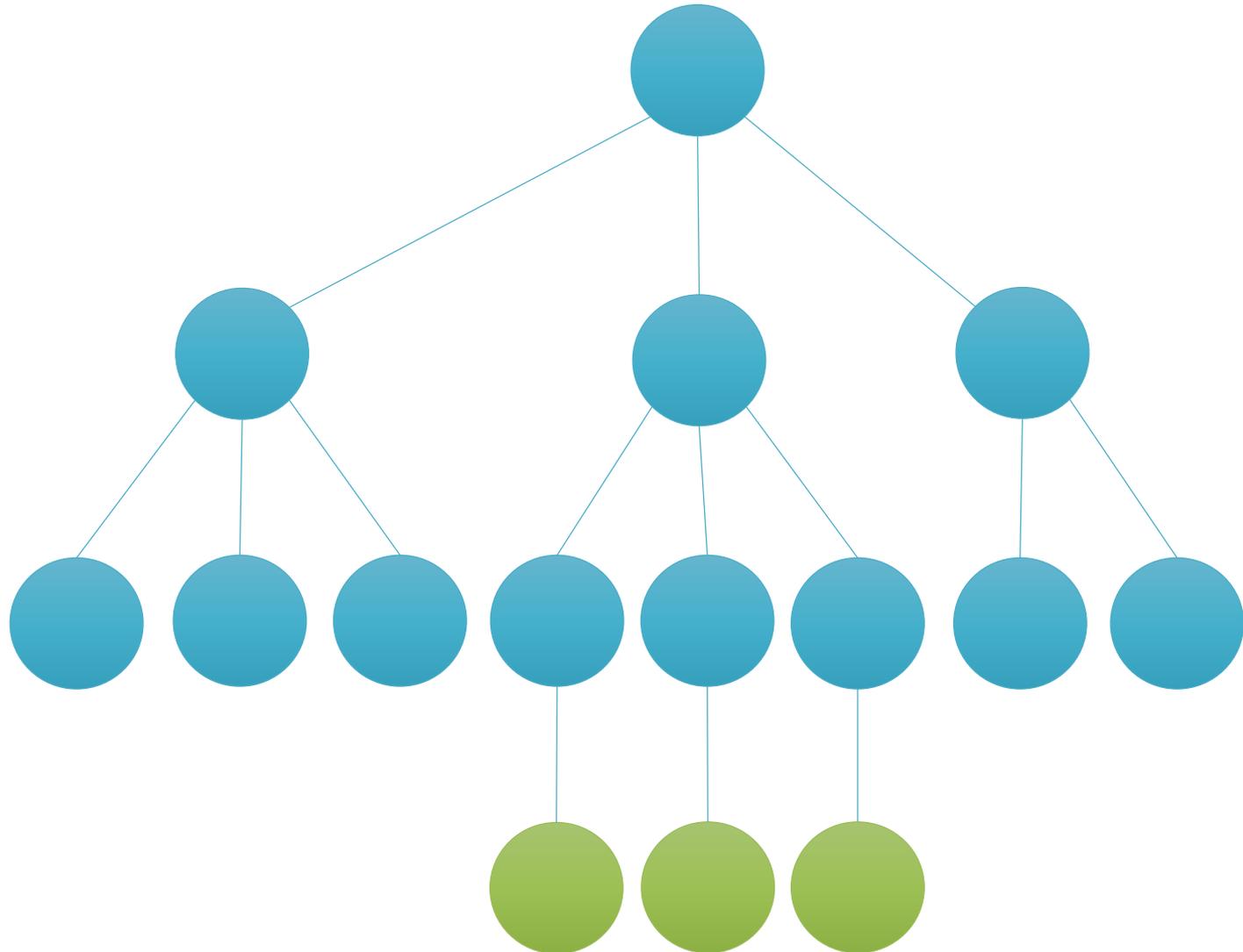
---

Now

I move

Opponent  
moves

I move



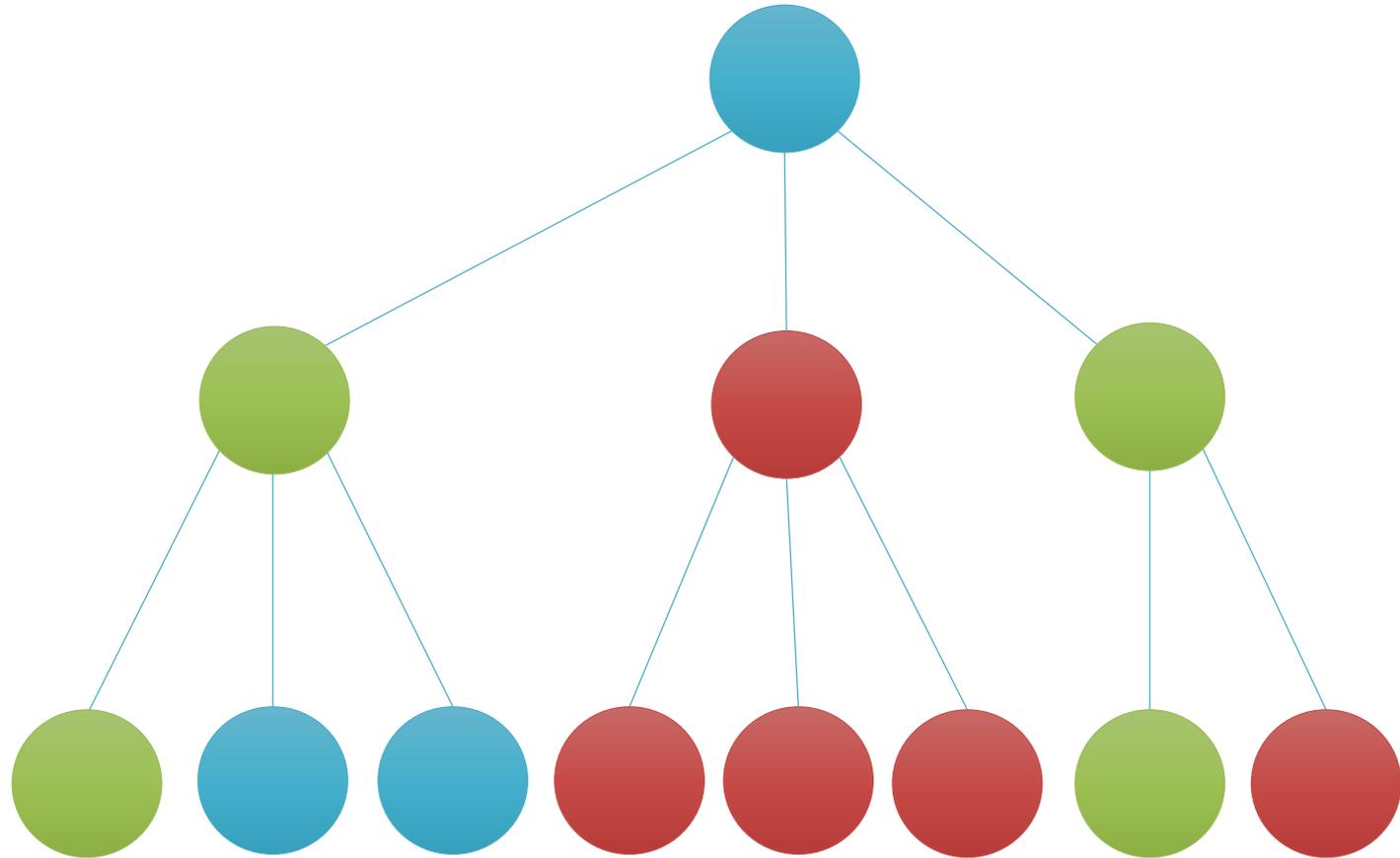
# Noncompetitive interpretation

---

Now

I move

I move



# Key Balance Questions

---

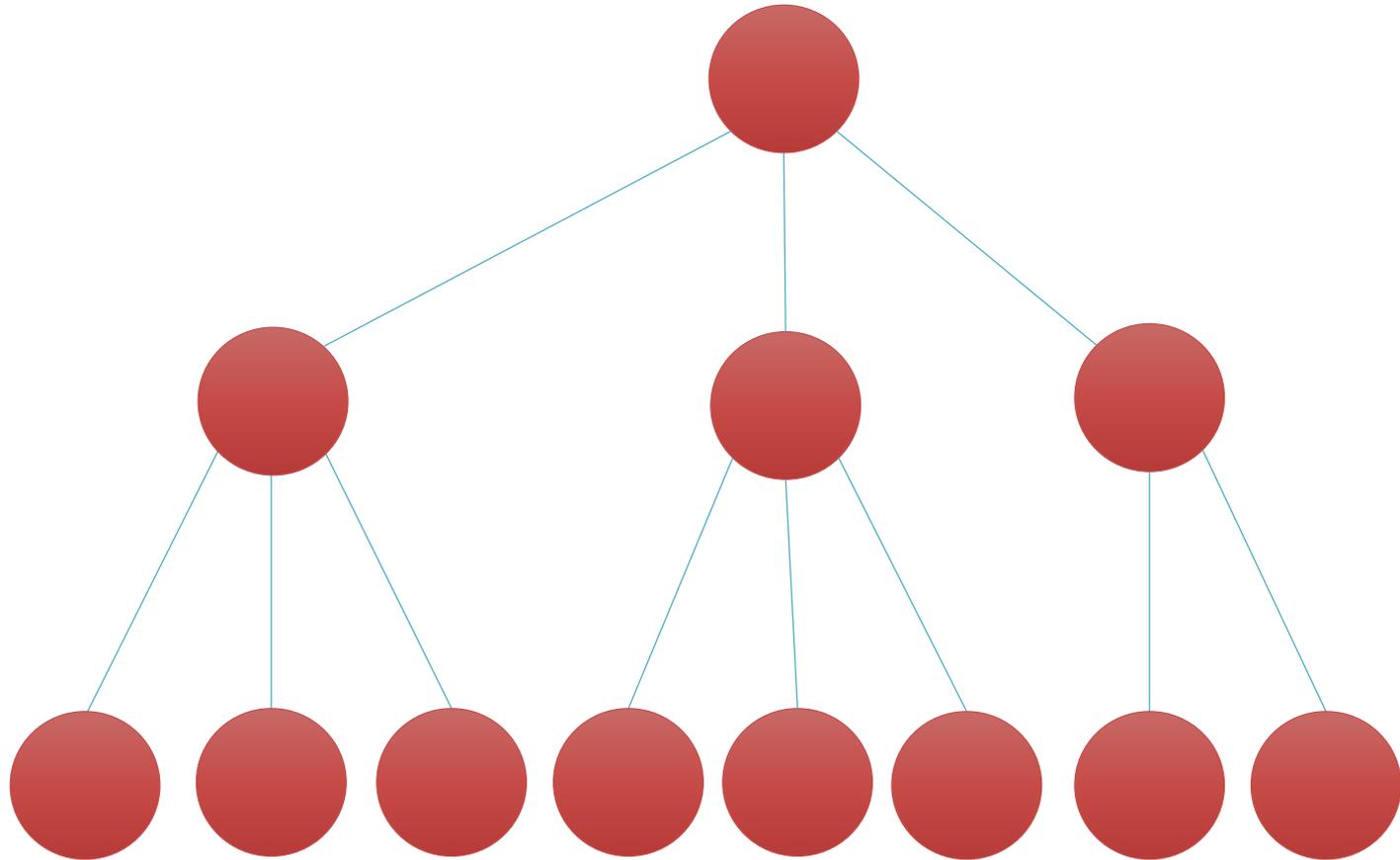
# Problem

---

Now

I move

I move



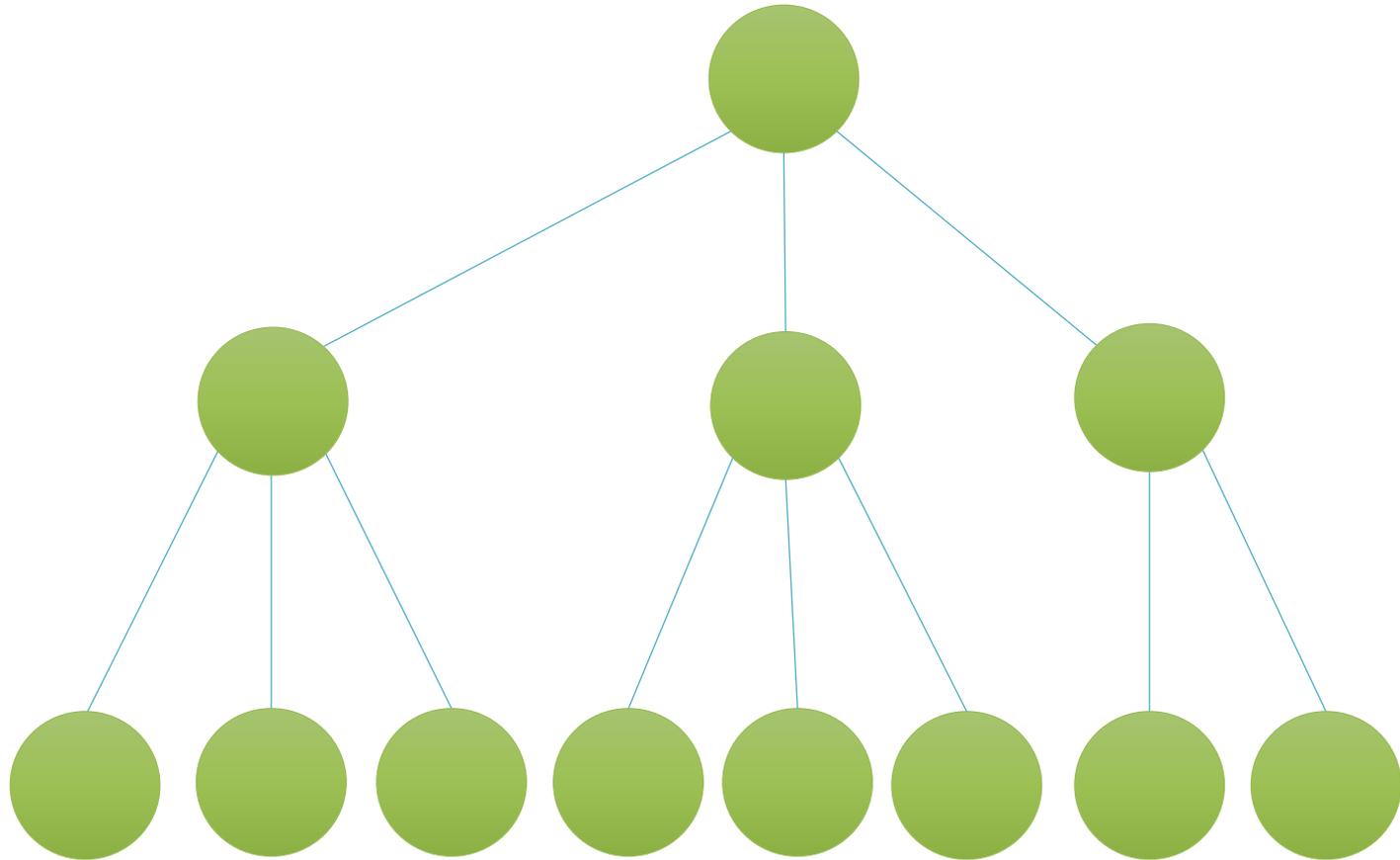
# Problem

---

Now

I move

I move



# Key Balance Questions

---

- Are the starting conditions of the game fair?
- Does it matter what the player does?

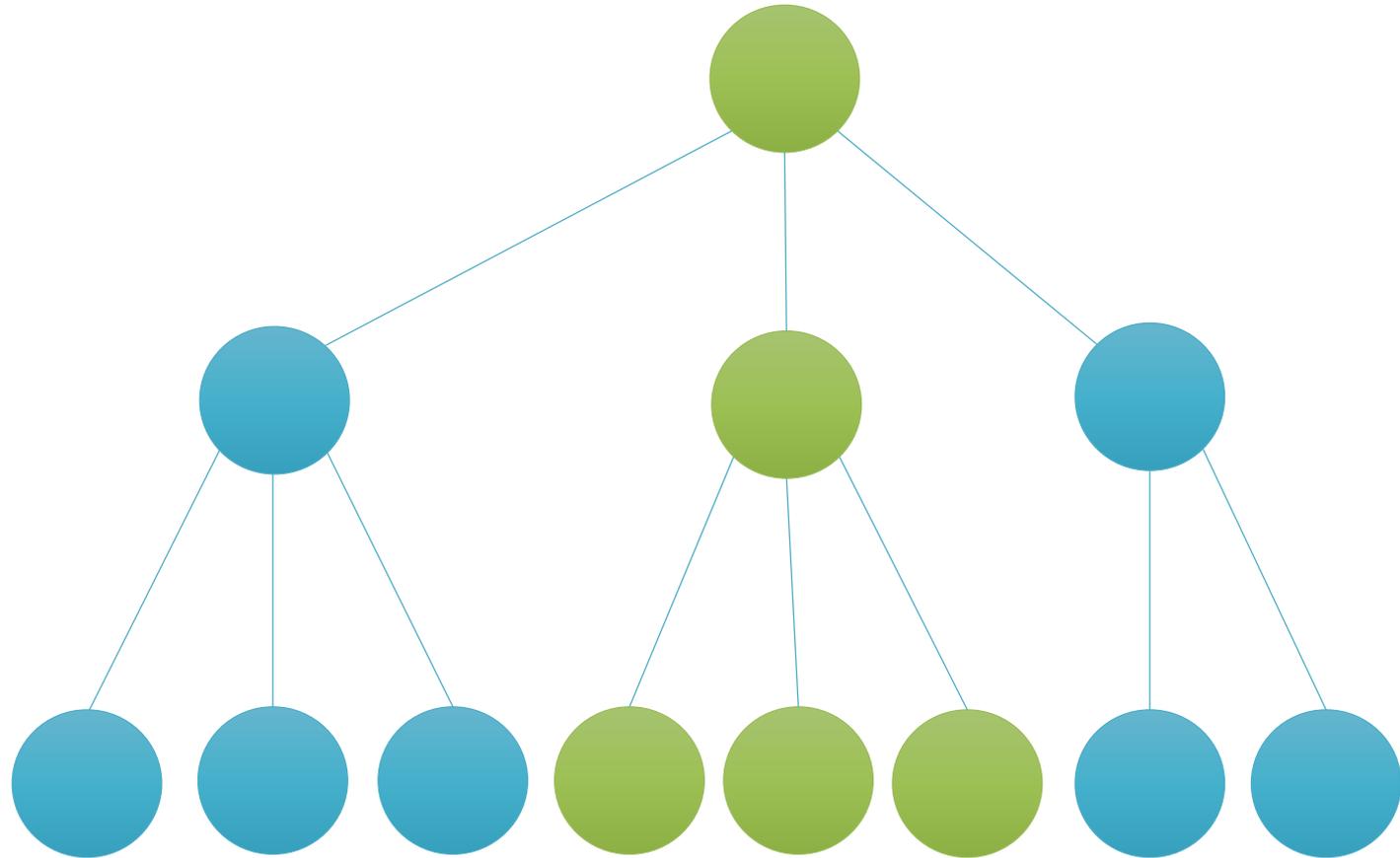
# Problem?

---

Now

I move

I move



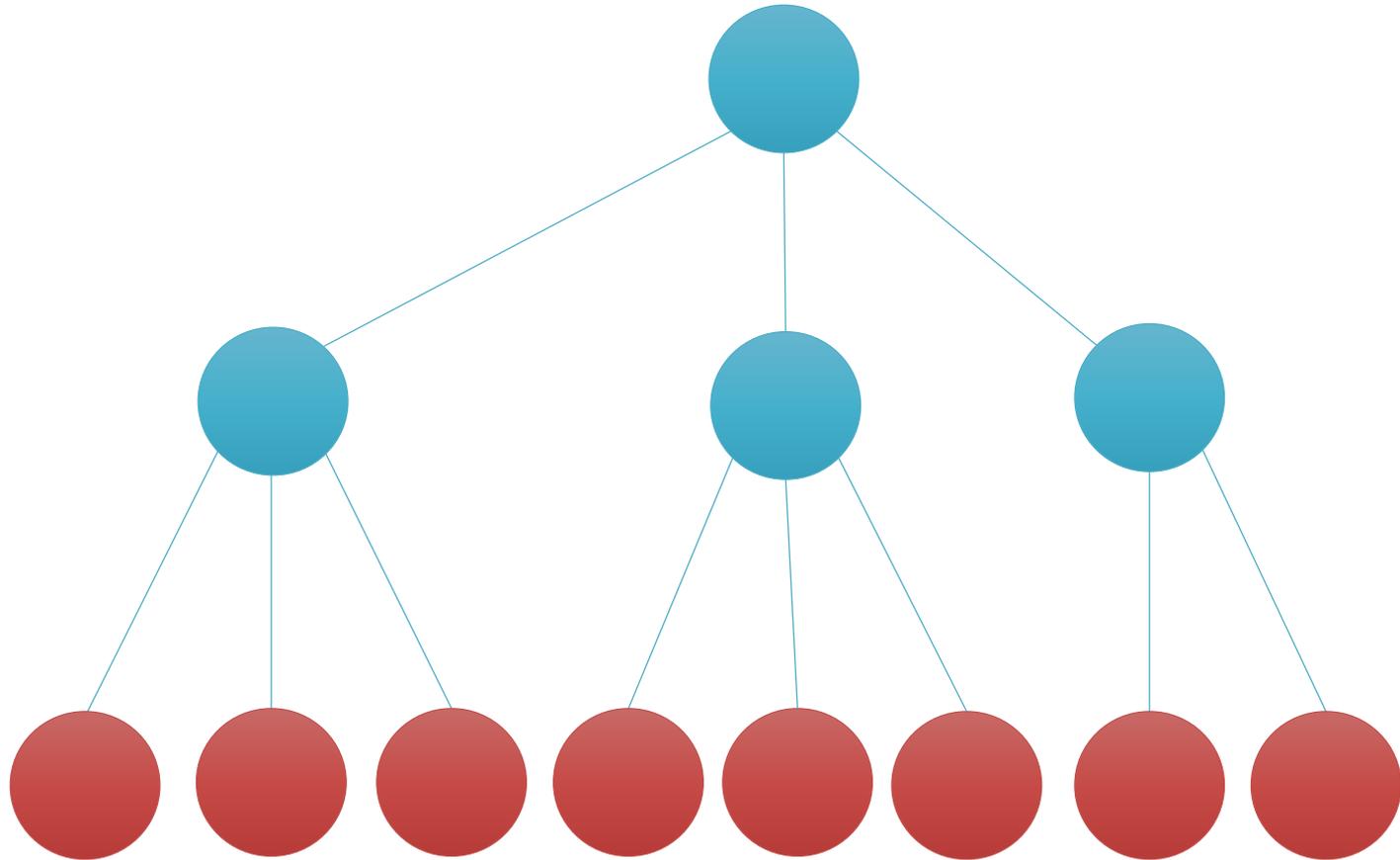
# Problem

---

Now

I move

I move



# Key Balance Questions

---

- Are the starting conditions of the game fair?
- Does it matter what the player does?
- Is an action too powerful?
- Is the outcome known long before the game's end?

# Outcome known too early

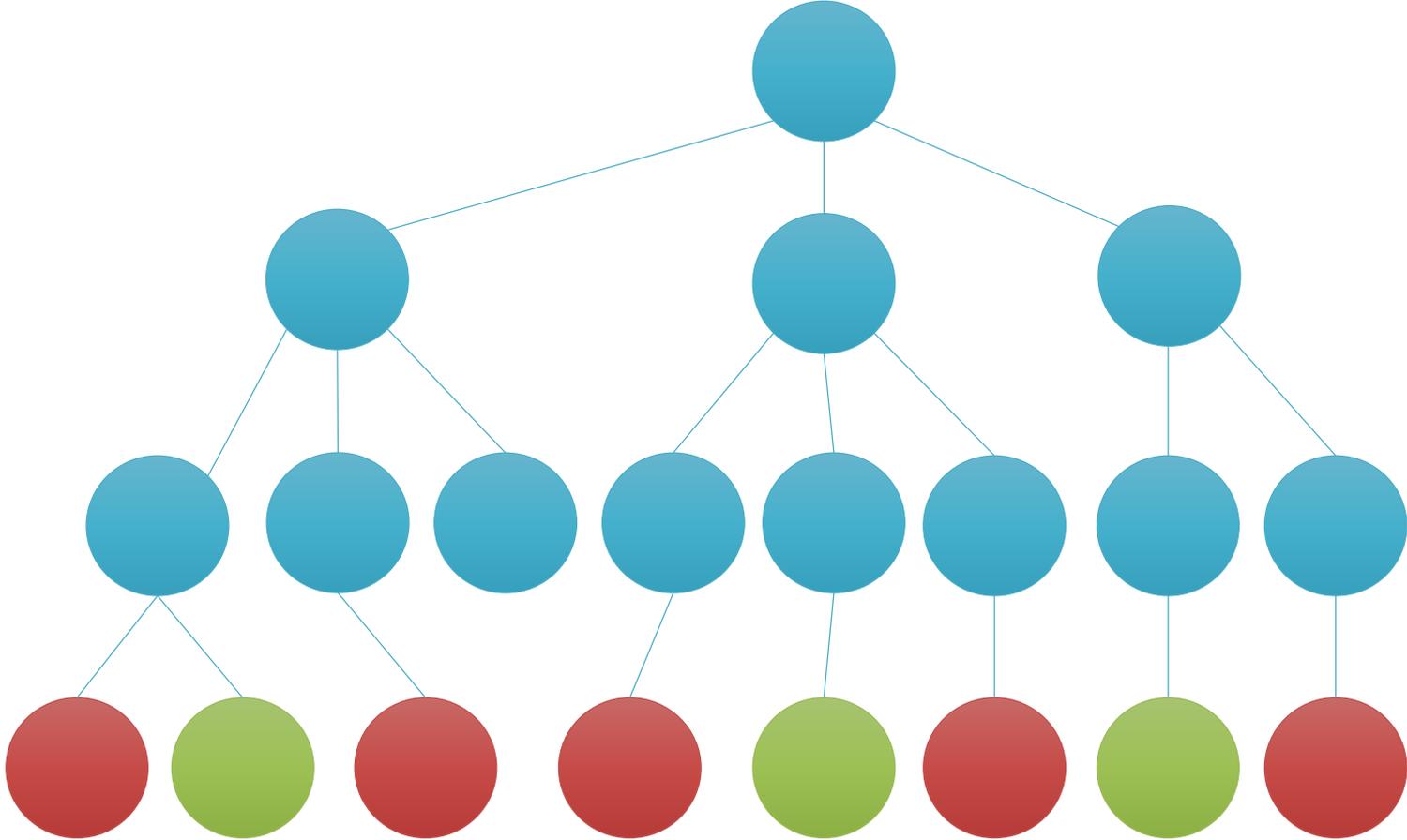
---

Now

I move

I move

I move



Interesting things need to be happening deep in the tree

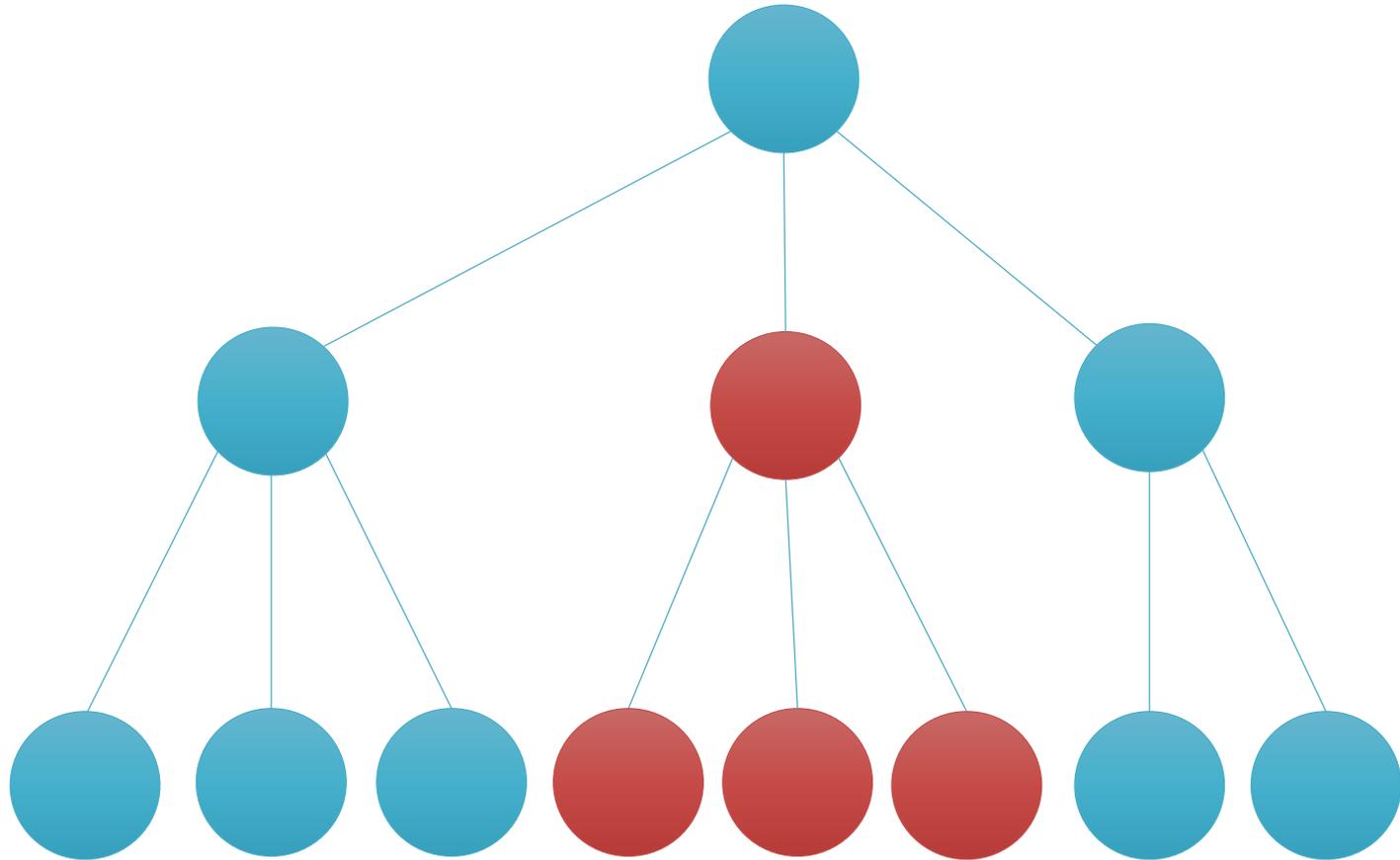
# Problem?

---

Now

I move

I move



# Key Balance Questions

---

- Are the starting conditions of the game fair?
- Does it matter what the player does?
- Is an action too powerful?
- Is the outcome known long before the game's end?
- Is some strategy *useless*?