

PROBLEM SET  
SQUISHING  
KRONOS

ESTIAN  
PENINSULA

*Xaίρε, friend. Sorry I'm late—I've been under the weather for the past few days. I'm sure you're not complaining, though.*

I've been taking all this cold medicine, and it's been shifting my conception of space and time. What is space? What is time? What would life be like in the absence of time? *What if we ignored all the rules?* What is the difference between an institution and the strategic tension it's designed to govern?

As I was sitting there debating these heady questions with The Other Socrates in the Room, I saw Kronos before me holding his scythe and looking for a little dog to eat. My baby! My poor little baby! Then my better half remembered that Laelaps hasn't been here in a while. But why do I see him standing before Time Personified? Laelaps once was here; is he to be here again? Space, time, Kronos, strategy, Laelaps...

I awoke in a cold sweat, clammy and feverish. Laelaps was nowhere to be found, but then again, neither was Kronos. And yet, I think I caught a glimmer of insight while I shivered my way through the feverish dream. Let me try to tell you about it, but please do remember that your humble tour guide is not feeling his best and might be prone to nonsense. Let us begin!

SOCRATES

# THIS GUY



This guy here? This Kronos, embodiment of time? This guy is messing with me. When I wake up, he's there. When I go to bed, he's there. When I die, he'll be there. This guy is everywhere and everywhen and everywherewhen and everywhenwhere and it feels like there's nothing I can do stop him.

And yet, when ruminating, I can see clearly what it is to stop Kronos from being such a T-boy: I can squish him. It's true that clock time lies beyond even my grasp, and yet strategic time remains my plaything alone—a conception of time similar enough to realtime for me to understand it, but different enough from realtime for me to maintain analytic control over it. And by “maintain analytic control,” I mean “squish the ever-lasting *skatá* out of this dude Kronos.” You may be here, kind sir, but you may not matter. I can see you and ignore you at the same time, thank you very much. Now go blow dry that thing you call a beard, and mind the split ends.



I realize that we will eventually have to respect Kronos, but given that he went after a hallucination of my dog, I'm not feeling the need to come correct just yet. I'm pretty sure I want to hit my personal pause button and bring things back to where I understand them. If we fail to do that, we run the risk of misunderstanding the difference between strategic tension and the way that tension manifests in the context of institutions (or non-institutions, for that matter). If we can't squish Kronos, then we are his toy; if we can squish him, he is ours.



I SQUISH YOU, FATHER TIME

I SQUISH YOU, FATHER TIME

I SQUISH YOU, FATHER TIME

I SQUISH YOU, FATHER TIME

I SQUISH YOU, FATHER TIME

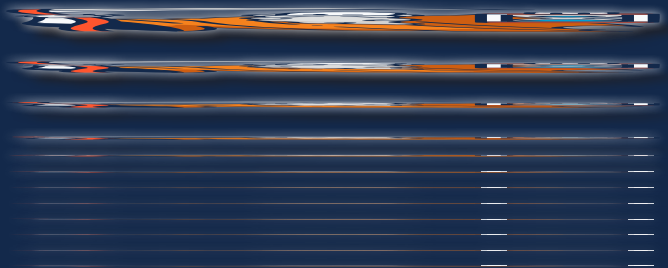
I SQUISH YOU, FATHER TIME

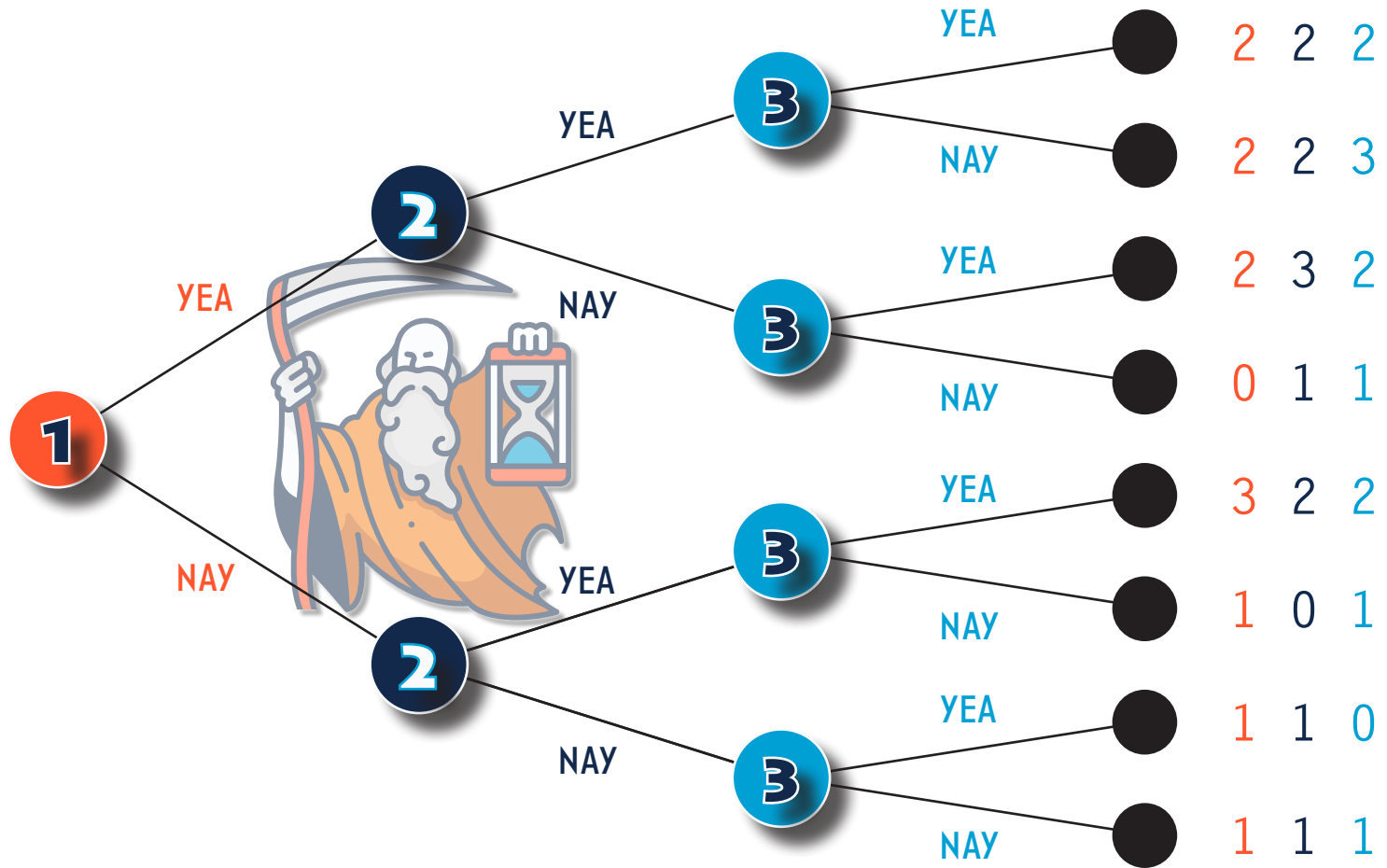
I SQUISH YOU, FATHER TIME

I SQUISH YOU, FATHER TIME

I SQUISH YOU, FATHER TIME

I SQUISH YOU, FATHER TIME





I was asleep on the couch in that half-awake-half-asleep world you live in after too much cold medicine. The news were on, so I overheard what I think was a vote in the Prytaneion about whether the senators ought to receive a raise. Three things seem to motivate what's going on here: first, the senators all want raises; second, senators don't want to get caught voting for their own raises; and third, they typically vote in order by region. I didn't hear what was going on with all nine senators, but I did catch the last three before rolling over and dozing back off. It was a tie by the time we got here, anyway.

We'll say that a senator's favorite outcome is getting a raise without having to vote for it; their second favorite outcome is getting a raise but having to vote for it; their third favorite outcome is not getting a raise without voting for it; and their least favorite outcome is not getting a raise but getting caught voting for it. The interaction is depicted above with all of the correct happiness point in there already.

So let's think already!

1. Which outcomes are Pareto optimal?
2. Squish the game into a strategic form game; have Voter 1 be rows, Voter 2 be columns, and Voter 3 be matrices.
3. Identify all pure-strategy Nash equilibria and provide substantive interpretations.
4. Consider the following claim: a strategy profile of the squished game is a pure-strategy Nash equilibrium if and only if it features unanimous voting. If so, why? If not, can you weaken the claim?
5. Consider the following claim: a strategy profile of the squished game is a pure-strategy Nash equilibrium if and only if the legislators get a raise. If so, why? If not, can you weaken the claim?
6. Consider the following claim: a strategy profile of the squished game is a pure-strategy Nash equilibrium if and only if it is Pareto optimal. If so, why? If not, can you weaken the claim?

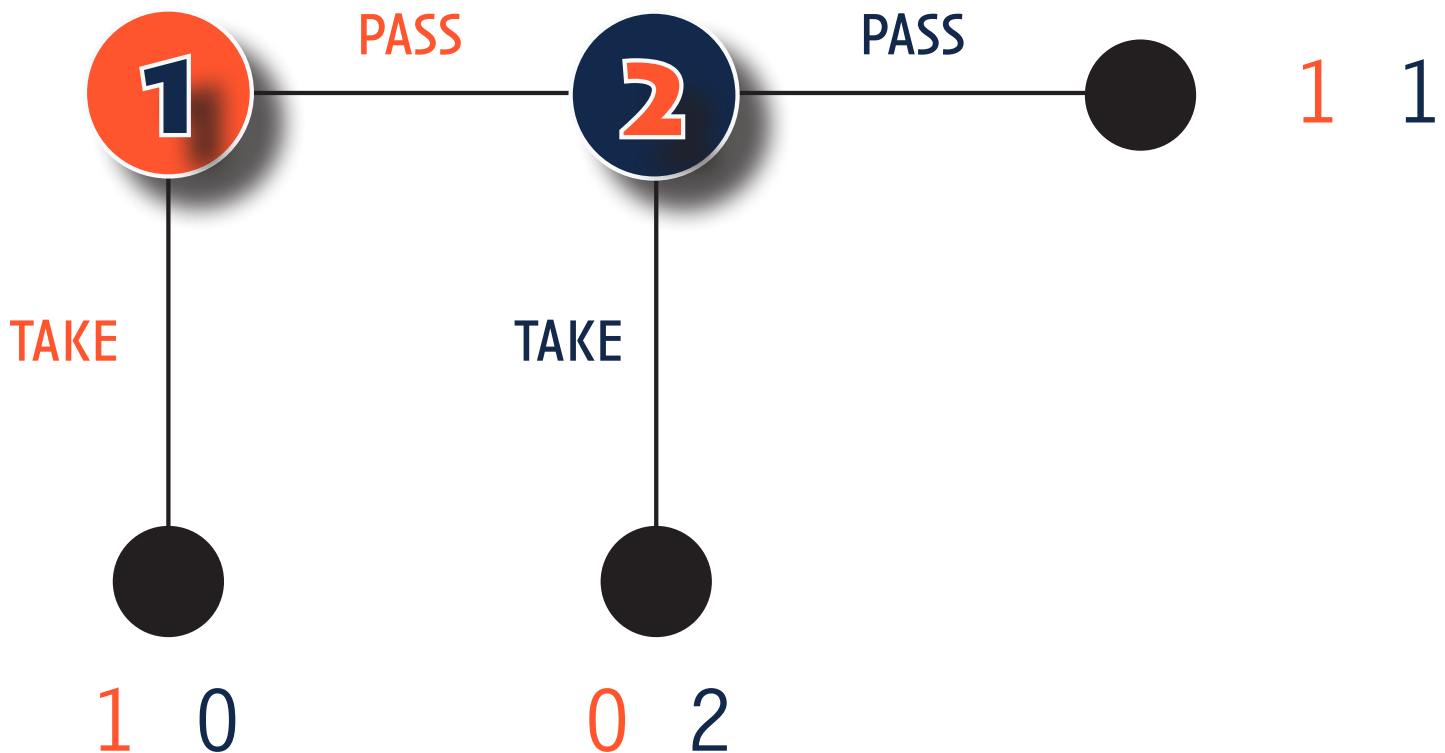
necessary for **PASS**: get 4

sufficient for one **ALMA**: get 6

By "weaken the claim," I mean "is there an implication in one direction or the other, given that there isn't an implication in both directions?"

# PART 2 | HOT POTATO

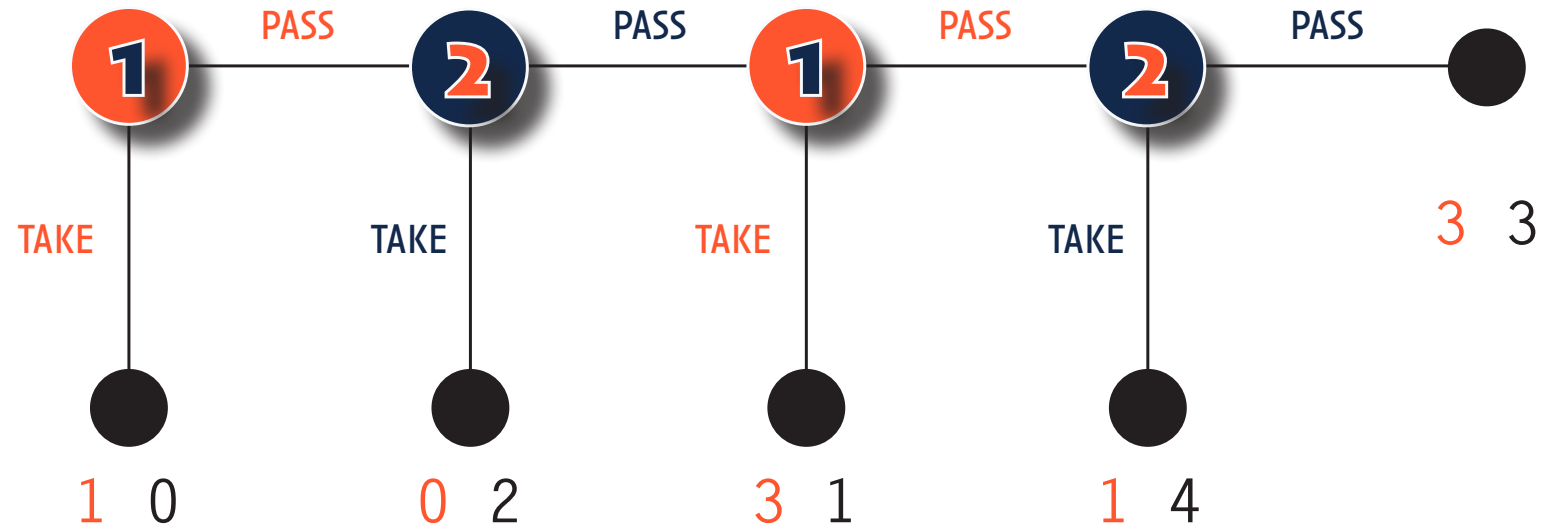
Apparently voting for raises is a reasonably new phenomenon among those dimwitted Hestallans: time was that they employed a rather archaic way of dividing the monies allocated for government. They would hold run-off elections until the nine senators coalesced into two camps. They then would play a public game of “pass the buck:” the first coalition would decide whether to keep one drachma (ending the interaction) or pass the buck to the second coalition. From there, the second coalition could either keep two drachmae or split the proceeds evenly.



Just to get our bearings:

1. Which outcomes are Pareto optimal?
2. Squish the game into a strategic form game.
3. Identify all Nash equilibria of the game (in pure or mixed strategies).
4. Evaluate the following claim: a strategy profile in the squished game is a Nash equilibrium if and only if it is Pareto dominated. If so, why? If not, can you weaken the claim?
5. How many equilibria does the squished game have?

Naturally, political theater like this gets better as you make it longer—otherwise, how will we keep citizens’ attention for an entire 24-hour news cycle?! So, it was decided to add more money to the pool and to add another full round of the interaction. Each time a coalition passed to the other coalition, more money went into the public pot. But, each round also meant that the incentive to take got tastier and tastier. Consider the two-round version below.



Now it's a party!

6. Which outcomes are Pareto optimal?
7. Squish the game into a strategic form game.
8. Identify all pure-strategy Nash equilibria of the squished game.
9. Evaluate the claim: a strategy profile of the squished game is a pure-strategy Nash equilibrium if and only if it features no delay. If so, why? If not, can you weaken the claim?

necessary for **PASS**: get 6

sufficient for one **ALMA**: get 9

sufficient for another **ALMA**: suppose the game continued on this way *ad infinitum*. How do your answers to Questions 6–9 respond in kind?

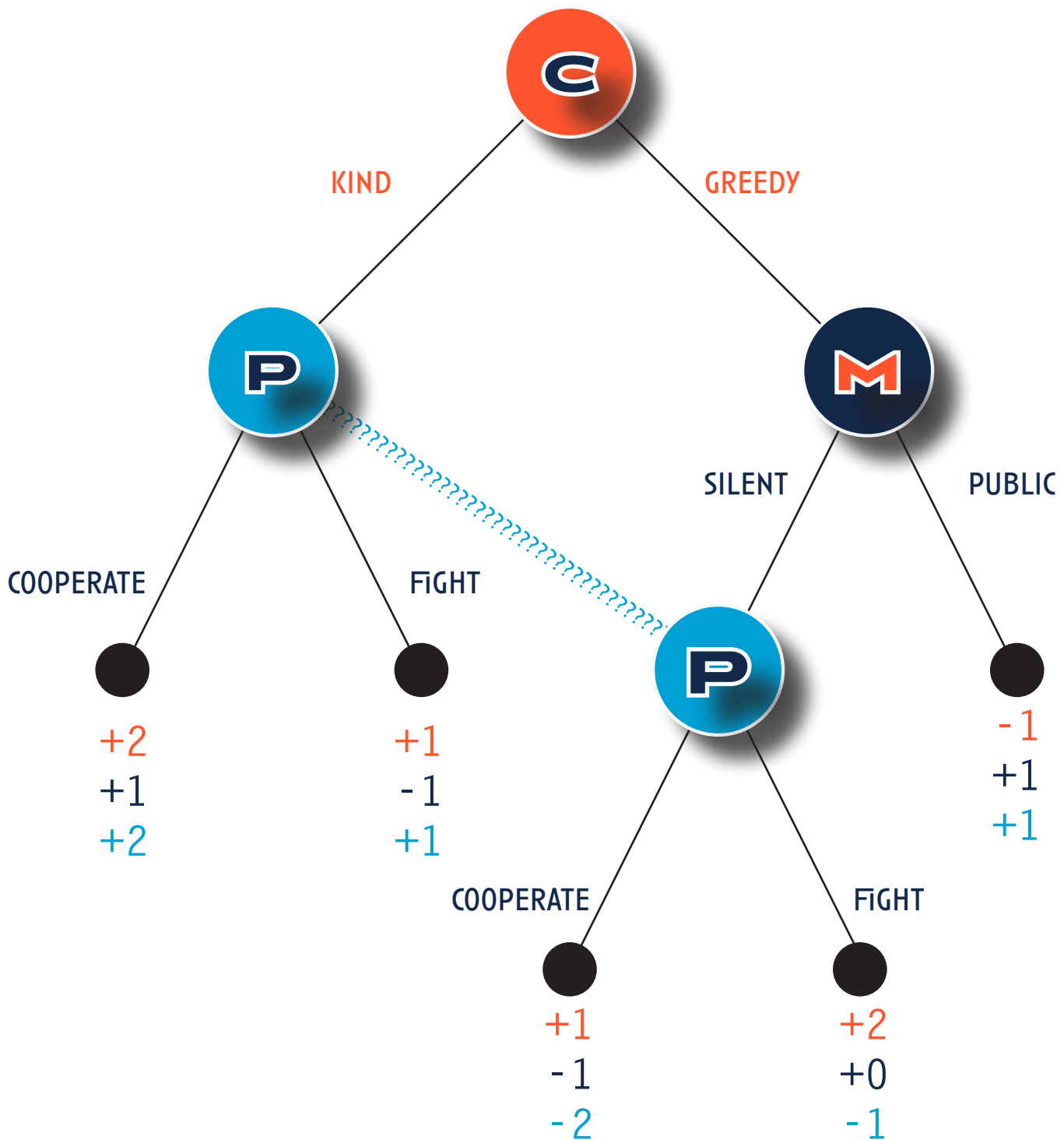




# PART 3

# MEDIA MATTERS

But things are even stranger here in the Olympia Prytaneion—we still haven't quite figured out how best to compensate the global senators! There's been a long-standing debate between the Cosmopolitans and the Politans on such matters. Frankly, I think the only thing standing between us and Total Cosmopolitan Domination is the media!



i have such a headache

1. Which strategy profiles are Pareto optimal?
2. In no more than a few sentences, describe what the Politans can and cannot see.
3. Now squish the game into strategic form; let the Cosmopolitans choose rows, the Media choose columns, and the Politans choose matrices.
4. Find all pure-strategy Nash equilibria of the game.
5. Assess the claim: a strategy profile is a pure-strategy Nash equilibrium of the squished game if and only if it is Pareto optimal. If so, why? If not, can you weaken the claim?
6. Assess the claim: a strategy profile is a pure-strategy Nash equilibrium of the squished game if and only if the Media remains Silent. If so, why? If not, can you weaken the claim?