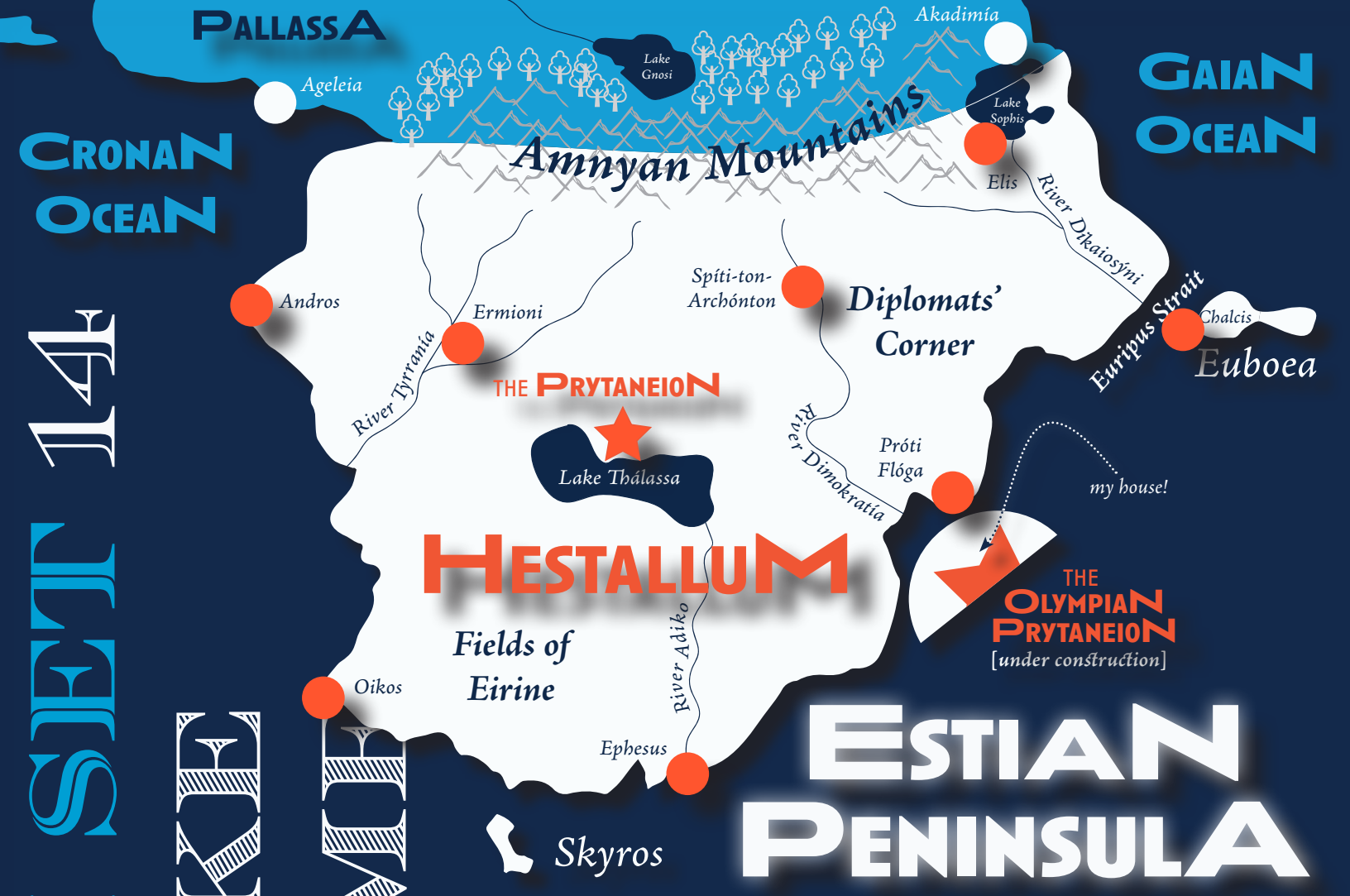


PROBLEM SET 14

DON'T TAKE IT FROM ME

SOCRATES

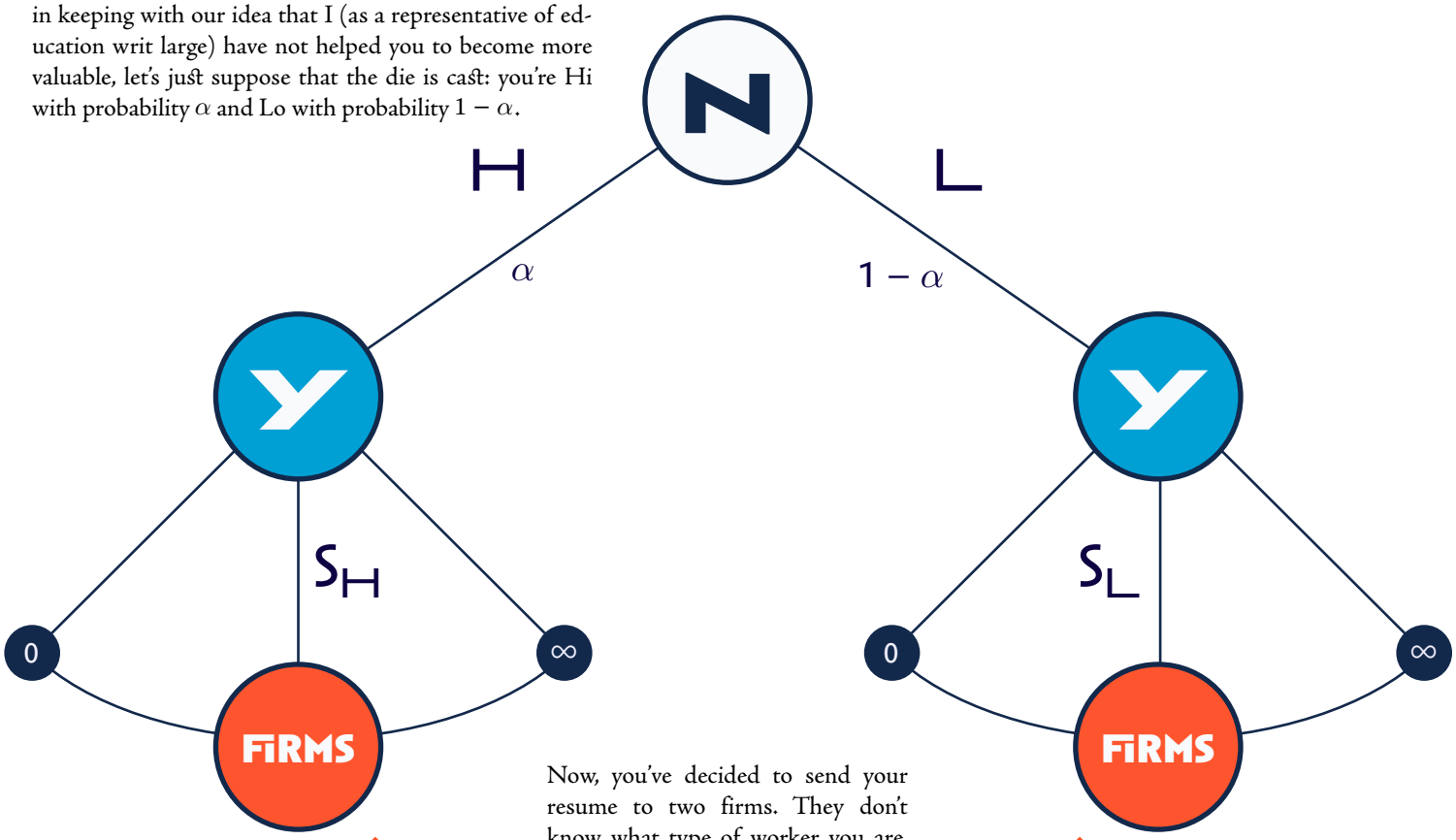
Χαίρε, friend. Can you believe how long we have been walking this path together? I am so proud to consider you my intellectual companion. What's your taste in music, by the way?

But it occurred to me that I might be doing you a disservice by asking you to walk this path with me. All this time, I have portrayed myself as a paragon of enlightenment and intelligence, but I've really just been asking you to check my work so that I don't look like a fool in front of those technocrats. You probably decided to undergo this process because it helped your prospects for success moving forward. And I don't blame you for that, because that's what the world asks of us anymore. And though I'm quick to blame the technocrats for that sort of thing, I also ought to remember that you are a person with goals, dreams, hopes, and aspirations, irrespective of the societal pressures you face. And though I hope some of those goals transcend mere transactions, I also know that there's something that might help fuel your experience moving forward. And that something is money.

Now, here's a question: do you think the time you've wasted playing my games, solving my riddles, enduring my parables, and checking my work...do you think it's made you more valuable as a worker? Well, what if it *didn't*...?

YOU ARE THE GAME

At the beginning of (your) time, Nature decided whether you are a Hi-quality worker or a Lo-quality worker. Now, in keeping with our idea that I (as a representative of education writ large) have not helped you to become more valuable, let's just suppose that the die is cast: you're Hi with probability α and Lo with probability $1 - \alpha$.

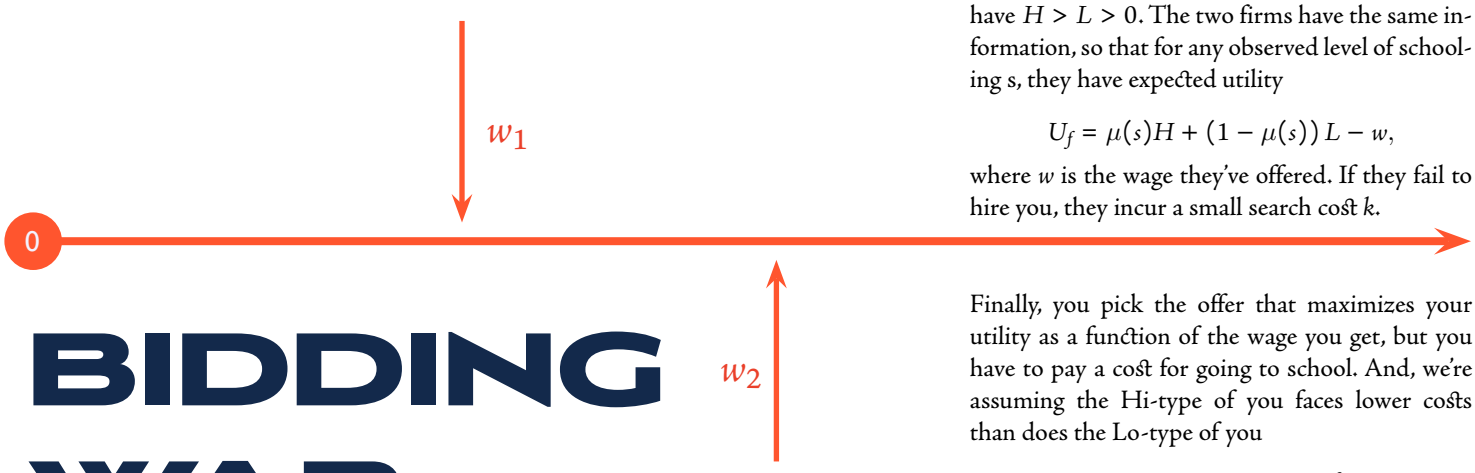


Now, you've decided to send your resume to two firms. They don't know what type of worker you are, but they do know how long you went to school. Call their updated belief about what kind of worker you are $\mu(s)$.

The two firms then make you a salary offer. They have the same utility function: their utility from hiring the Hi-type worker is H, and their utility from hiring the Lo-type worker is L, where we have $H > L > 0$. The two firms have the same information, so that for any observed level of schooling s, they have expected utility

$$U_f = \mu(s)H + (1 - \mu(s))\,L - w,$$

where w is the wage they've offered. If they fail to hire you, they incur a small search cost k.



BIDDING WAR

Finally, you pick the offer that maximizes your utility as a function of the wage you get, but you have to pay a cost for going to school. And, we're assuming the Hi-type of you faces lower costs than does the Lo-type of you

$$U_H(s) = w(s) - \frac{c}{H}$$
$$U_L(s) = w(s) - \frac{c}{L}$$

where $c > 0$ scales the cost of education.

time to make you some money, kid, and maybe save you some time:

1. What is the Nash equilibrium of the bidding war game between the two firms?
2. What profit do the firms turn in the bidding war game?
3. Suppose the Hi type of worker goes to school for some strictly positive amount of time $s_H > 0$, whereas the Lo type worker goes to school for no time at all: $s_L = 0$. What are $\mu(s_H)$ and $\mu(s_L)$?
4. What are $w(s_H)$ and $w(s_L)$ in this scenario?
5. Suppose further that the two firms set $\mu(s) = 0$ for all $s \neq s_H$. What is $w(s)$ for these other levels of schooling?
6. Under what conditions does neither type of you have incentive to deviate?
7. Clean slate! Suppose that the two types of you go to school for the same amount of time: $s_H = s_L = s > 0$. What is $\mu(s)$?
8. What is $w(s)$ in this scenario?
9. Suppose again that the two firms set their belief to zero for all other levels of schooling. Under what conditions does neither type of you have an incentive to deviate?

necessary for **PASS**: get 7

sufficient for one **ALMA**: get 9