experiment:

Omer Angel

N: When do you stop.

Growing Pot.

Game tree:
At each node, one player makes a decision.
Leaves: Outcome

Perfect info.: all known.

Pure strategy: where to go from each node.
Mixed: random pure strategy.
With perfect information: All optimal pure strategies, computed bottom-up.

Imperfect information: Per nodes are split to information sets. Only know which set you are in.

E.g., Matrix form:

```
info set
```

```
col 1 2 1 2
row 1 2 1 2
```

```
100-K,K 0,0
```

```
x

N
```

```
100-K,K
```
Claim

$R = \text{reputation cost.}$

Assume $\frac{1}{5}$ of fish are old.

<table>
<thead>
<tr>
<th>Truth</th>
<th>Buy</th>
<th>No Buy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy</td>
<td>$3 + \frac{4}{5}R$, $\frac{8}{5}$</td>
<td>$-1$, 0</td>
</tr>
<tr>
<td>Lie</td>
<td>$5 + \frac{3}{5}R$, $-\frac{2}{5}$</td>
<td>$-1$, 0</td>
</tr>
</tbody>
</table>
\[(T, B) \Rightarrow \begin{cases} -5, 0 & \text{w.p. } \frac{1}{5} \\ 5+R, 2 & \text{w.p. } \frac{4}{5} \end{cases}\]

\[\Rightarrow 3+\frac{4}{5}R, \frac{8}{5}\]

\[(L, B) \Rightarrow \begin{cases} 5+R, 2 & \text{w.p. } \frac{4}{5} \\ 5-R, -10 & \text{w.p. } \frac{1}{5} \end{cases}\]

avg is \[5+\frac{3}{5}R, -\frac{2}{5}\]

\[(T, B) \text{ is a N.E. iff } 3+\frac{4}{5}R \geq 5+\frac{3}{5}R\]

i.e. \[R \geq 10\]

\[(L, N) \text{ is always a N.E.}\]
For imperfect information games:

Thm: Always exists mixed N.E of realizable strategies

↑
same distribution on actions at every vertex of an info. set.

Incomplete info.: The game tree is not known/random.

E.g.  

\[
\begin{array}{c}
H \\
\begin{array}{ccc}
1 & 0 \\
0 & 0 
\end{array}
\end{array} \\
\begin{array}{c}
I \\
0 & 0 & 0 
\end{array}
\]

Ruth sees coin, Ruth decides → reveals
Chris decides.
In this case, $\frac{3}{4}$ is best Ruth can get.

Chris strat.: In game 1 choose randomly.

In game 2: w.p. $\frac{1}{2}$ play opposite of Ruth's first choice.

w.p. $\frac{1}{2}$ play randomly.

If Ruth plays better row in game 1 w.p. $p$

Game 1: $\frac{P}{2}$

Game 2: $\frac{1}{2} \cdot P \cdot 0 + \frac{1}{2} (1-P) \cdot 1 + \frac{1}{2} \cdot \frac{1}{2}$

$= \frac{P}{2} + \frac{1-P}{2} + \frac{1}{4} = \frac{3}{4}$
Same coin + matrices.

* Ruth sees coin.
* Play once (simultane.)
* Actions revealed, but not payoff.
* Play 2nd time.
* Get paid for both rounds.

If Ruth always chooses 1 if H
gets \( \frac{1}{2} \) in first game
\( 0 \) in 2nd.

If Ruth plays randomly \( (\frac{1}{2}, \frac{1}{2}) \) in first game,
gets \( \frac{1}{4} \) in game 1
\( \frac{1}{2} \) in game 2

Total: \( \frac{3}{4} \)
Collect Midterm + old assignments.

Canvas: Grades are in progress

Today: Misinformation
      Lacking inform.
      Extensive form of games
* Ante 1
* get 1 card each.

P.1: 
- Bet 1
  - Check: No bet

P.2:
  - If P.1 bets: P2: 
    - fold: lose.
    - call: also bet
  - If P.1 checks: P2: 
    - bet
    - no bet
  - If P.2 bets: P1: 
    - fold
    - call.