Used Cars: (Lemons)

e.g. Car worth 9000 to seller
12000 to buyer.

If sold for 10.5K, both gain 1500

Lemon: worth 4K to seller
6K to buyer.

Seller knows if the car is a lemon.
Buyer does not.

If fraction \( p \) of cars are lemons:
Buyer will pay at most \( 6p + 12(1-p) \)
\[ f(p) = (2-6p)K \]

If a seller asks for \( Q < f(p) \) then
the car is sold.
If ask for \( Q > f(p) \) not sold.

\[ p < \frac{1}{2} \Rightarrow f(p) > 9000 \]
If \( p > \frac{1}{2} \): \( f(p) < 9000 \).

Good cars no longer sold.

Over time, \( p \) will increase.

Only lemons are sold.

Both sides end up worse compared to \((1.5, 1.5)\) for selling a good car.
Extensive form (Tree form)

\( = \) terminal states

\((1, -1)\) : win for P.1

\((a, b)\) : payoff a, b

At each node, specify which player moves.

Chomp

equivalent nodes
Extensive form is very large even for small games.

4 chips, subtract \{1, 2\}
Can find outcome from bottom up.

Mutually Assured Destruction

Giving up options can improve your outcome.
Each player in turn has a choice:
* add 2 to pot.
* take 2, split pot, game ends.

After turn N, split in any case.

e.g. N=106

By induction, bottom-up always better to take money + stop.
10 pirates, 100 gold coins.

Strongest... weakest.

Each in order makes a proposal how to split.

* Vote — Majority ($\geq \frac{1}{2}$) yes: split coins.

  Majority no ($\geq \frac{1}{2}$): Kill strongest.

  Continue.

Q: what happens?
For simultaneous actions:

Information sets!

e.g. $s \begin{pmatrix} (-1, -1) & (0, 2) \\ w \begin{pmatrix} (2, 0) & (-M, -M) \end{pmatrix} \end{pmatrix}$

game of chicken.

Information set.

Equivalence relation.

Partition vertices to sets.
A player does not know where they are, only which set.