DISCUSSION 3

18.1)

	Prefer	Either
Prefer	S, S	H, L
Either	L, H	$\frac{1}{2}(H+L)$, $\frac{1}{2}(H+L)$

↳ $S > L$ so Prefer is strictly dominant
↳ $S < \frac{1}{2}(H+L)$ so (Either, Either) is Pareto optimal

27.1) a)

	Q	F
Q	2, 2	0, 3
F	3, 0	1, 1

$m_i + m_j \Rightarrow$

	Q	F
Q	4, 4	3, 3
F	3, 3	2, 2

Not Prisoners.

b) $m_i + \alpha m_j$

	Q	F
Q	$2+2\alpha$, $2+2\alpha$	3α, 3
F	3, 3α	$1+\alpha$, $1+\alpha$

↳ $3 > 2+2\alpha$ and $1+\alpha > 3\alpha$
$\frac{1}{2} > \alpha$ $\quad$ $\frac{1}{2} > \alpha$ so F is strictly dominant
↳ $2+2\alpha > 1+\alpha$
$\alpha > -1$ so Q is Pareto optimal.
↳ Not Prisoner when $\alpha \geq \frac{1}{2}$. Nash:

$\alpha = \frac{1}{2}$

	Q	F
Q	$2+2\alpha$, $2+2\alpha$	3α, 3
F	3, 3α	$1+\alpha$, $1+\alpha$

$\alpha > \frac{1}{2}$

	Q	F
Q	$2+2\alpha$, $2+2\alpha$	3α, 3
F	3, 3α	$1+\alpha$, $1+\alpha$

3) Another Stag Hunt. Extend the n-hunter game where each gets K units of "effort" to allocate between stag and hare. The stag gets caught based on maximum of hunters' efforts: $u^i = 2 \cdot \max_j e_j - e_i$.

a) Find any symmetric Nash.
↳ $e^i = 0$ not Nash (increase effort)
↳ $e^i = K$ not Nash (free ride)
↳ $0 < e^i < K$ not Nash (again, free ride).

b) Can there be asymmetric Nash? yes!
$e^i = K$ and $e^j = 0$ for all other j.

c) Any others?
- Say two people put in effort => not Nash.
- Already discussed case with zero people effort.
- One person effort must be part b).

4) a) A strategy that is weakly dominant for each player is a Nash equilibrium. T.

b) Symmetric games must have at least one symmetric equilibrium. F.

c) The standard Cournot game we discussed today can have multiple equilibria F.