Yield vs Fight:

Confrontation between two people. P_1, P_2

Each can choose to either — Yield (Y)
— Fight (F)

One type of Player 1.
Two types of Player 2

Player 2

Strong P = 1/4

Weak P = 3/4

Bayesian Yield vs Fight

Strong
P(S) = 1/4

	Y	F
Y	0, 0	0, [1]
F	1, 0	-1, [1]

Weak
P(W) = 3/4

	Y	F
Y	0, 0	0,[1]
F	1,[0]	1, -1

Player 2 chooses (F, Y)

Player 2 of type Strong chooses F

Player 2 of type Weak chooses Y

$U_1\left(Y, (F, Y)\right)$

Player 1 chooses Y

Player 2 of type strong

Player 2 of type Weak

$$= 0 \times \frac{1}{4} + 0 \times \frac{3}{4} = 0$$

$$U_1\left(F,(F,Y)\right)$$

Player 1 Choosing F

Player 2 of type strong chooses F

Player 2 of type weak chooses Y.

$$= -1 \times \frac{1}{4} + 1 \times \frac{3}{4} = -\frac{1}{4} + \frac{3}{4}$$

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

Let player 2 choose

$$(F, F)$$

Player 2 of type Strong Chooses F

Player 2 of type weak Chooses F

$$U_1\left(Y, (F,F)\right)$$
$$= 0 \times \frac{1}{4} + 0 \times \frac{3}{4} = 0$$
$$U_1\left(F, (F,F)\right)$$
$$= (-1) \times \frac{1}{4} + 1 \times \frac{3}{4} = -\frac{1}{4} + \frac{3}{4}$$
$$= \frac{1}{2}$$

We also have to compute average payoffs of Player 1, corresponding to (Y,F), (Y,Y) of Player 2.

(Y, F) — Player 2 of type strong chooses Y
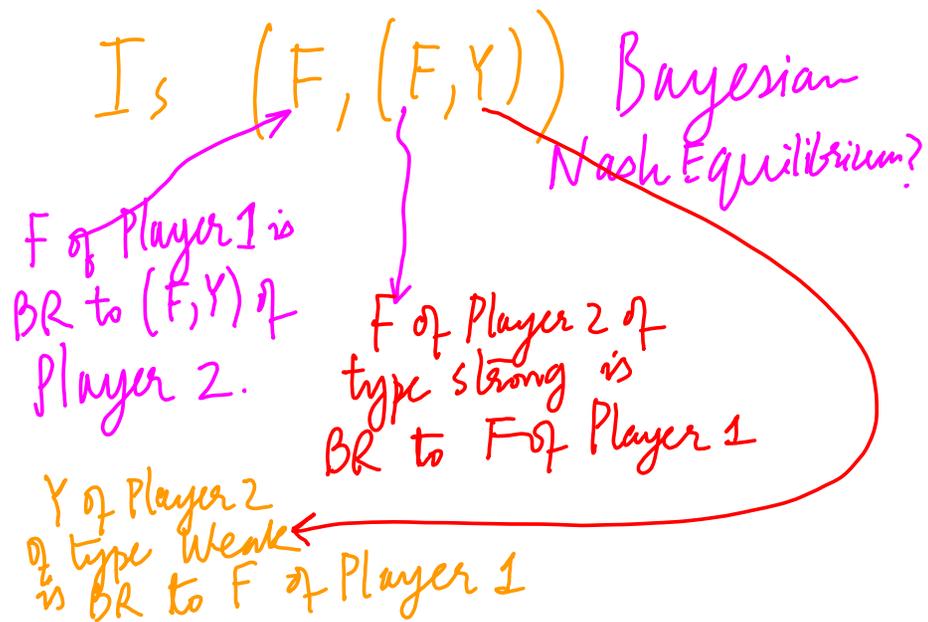
Player 2 of type weak chooses F

(Y, Y) — Player 2 of type strong chooses Y

Player 2 of type weak also chooses Y.

Y is a dominated strategy for player 2 of type strong.

Therefore, in any Nash
Equilibrium of the game,
Player 2 of type Strong
is NOT choosing Y.

Average payoffs of Player 1

	(F, Y)	(F, F)	(Y, F)	(Y, Y)
Y	0	0		
F	$\frac{1}{2}$	$\frac{1}{2}$		

Is $(F, (F, Y))$ Bayesian Nash Equilibrium?

F of Player 1 is BR to (F, Y) of Player 2.

F of Player 2 of type strong is BR to F of Player 1

Y of Player 2 of type Weak is BR to F of Player 1

Therefore $(F, (F, Y))$ is a Bayesian Nash Equilibrium of this game since each player of each type is playing BR.

Is $(F, (F, F))$ a BNE?

Player 1 chooses F

Player 2 of Type Strong chooses F

Player 2 of type Weak chooses F   NOT BR

NOT BNE.

Bayesian Nash Equilibrium is

$(F, (F, Y))$

Player 1 Chooses F

Player 2 of Type Strong chooses F

Player 2 of type Weak chooses Y.