Here is the EFG for the Stackleberg variant of the Cournot duopoly game from HW2. Let’s find player 2’s set of possible strategies.

A strategy is a complete contingent plan. This means that a full strategy for a player should give instructions as to what they will do in all possible realizations of the game so that there is no ambiguity. Player one has the first move, so their strategy set is as follows:

\[ S_1 : \{3, 5, 7\} \]
Player one is the first mover, so they simply choose which branch to go down. Player two, however, must have a more specific set. It is incomplete simply to say that their strategy set is the same because there are contingencies that P2 observes that P1 does not by virtue of being the first mover. A proper strategy should be instructive as to player 2’s move at each possible realization.

An example strategy for P2 is as follows (where $x_1$ represents the choice made by player 1):

(3 if $x_1=3$, 3 if $x_1=5$, 3 if $x_1=7$)

Another possible strategy for P2:

(5 if $x_1=3$, 7 if $x_1=5$, 3 if $x_1=7$)

Now, to create the (incomplete) strategy set for player 2:

$S_2$: \{(3 if $x_1=3$, 3 if $x_1=5$, 3 if $x_1=7$), (5 if $x_1=3$, 7 if $x_1=5$, 3 if $x_1=7$), etc\}

Then, when converting this EFG to SFG, player one will have 3 rows corresponding to each of their 3 strategies and player two will have $3^3 = 27$ columns corresponding to the 27 different ways they can specify their strategy. Note that payoffs never appear in a strategy set!