4. [For everyone] After reading section 1.1.B. of Gibbons, generate three random 2-player games with both players with 3 strategy-choices, and pay-offs between 0 and 3, and eliminate, BY HAND, as many strategies as you can, until you are left with a possibly smaller game (i.e. bimatrix). Is it ever a 1 by 1 bimatrix?

#1

Player 2

Player 1	A	B	C	
	[1, 1]	[3, 0]	[0, 2]	D
	[3, 0]	[1, 0]	[1, 2]	E
	[3, 2]	[2, 1]	[0, 2]	F

Here, player 2 has a strictly dominated strategy: B is dominated by C since

$2 > 0$, $2 > 0$, $2 > 1$.

Elimanate B.

Player 2

Player 1	A	C	
	[1, 1]	[0, 2]	D
	[3, 0]	[1, 2]	E
	[3, 2]	[0, 2]	F

Now, player 1 has a strictly dominated strategy: D is dominated by E since

$3 > 1$, $1 > 0$

Eliminate row D.

Player 2

Player 1	A	C	
	[3, 0]	[1, 2]	E
	[3, 2]	[0, 2]	F

There is no more strictly dominated strategies so this cannot be reduced.

2

Player 2

Player 1	A	B	C	
	[2, 2]	[0, 3]	[2, 2]	D
	[3, 1]	[2, 0]	[0, 2]	E
	[0, 0]	[1, 1]	[1, 2]	F

While we do not have a strictly dominated strategy for either player, we have a dominated strategy for Player 2:

A is dominated by C since:

$2 \geq 2, \quad 2 \geq 1, \quad 2 \geq 0$

Eliminate column A.

Player 2

Player 1	B	C	
	[0, 3]	[2, 2]	D
	[2, 0]	[0, 2]	E
	[1, 1]	[1, 2]	F

Here, player 1 does not have a dominated strategy. We cannot reduce this any longer.

#3

Player 2

Player 1	A	B	C
D	[1, 3]	[3, 2]	[1, 0]
E	[0, 0]	[2, 3]	[3, 0]
F	[2, 1]	[2, 3]	[0, 1]

Here, player 2 has a strictly dominated strategy: C is strictly dominated by B.

$2 > 0, \quad 3 > 0, \quad 3 > 0$

Eliminate C.

Player 2

Player 1	A	B
D	[1, 3]	[3, 2]
E	[0, 0]	[2, 3]
F	[2, 1]	[2, 3]

Player 1 has a strictly dominated strategy: E is strictly dominated by D since

$1 > 0, \quad 3 > 0$

Eliminate E.

Player 2

Player 1	A	B
D	[1, 3]	[3, 2]
F	[2, 1]	[2, 3]

There are no more strictly dominated strategies so the iteration stops.