

FIT3139: Lab questions for week 12

Question 1

Create a program that takes a bimatrix game and returns a solution via dominance, if the game is solvable by iterated removal of dominated strategies. The game should be represented by matrices A and B , with the same dimensions $m \times n$. This means there are m actions for the row player, and n actions for the column player. Your algorithm should report an error if the game is not solvable by iterated dominance.

Question 2

Do this one by hand. Find all pure Nash equilibria of the game given by:

$$A = \begin{pmatrix} 5 & 7 & 2 \\ 8 & 6 & 5 \\ 1 & 8 & 4 \end{pmatrix} \quad B = \begin{pmatrix} 5 & 8 & 1 \\ 7 & 6 & 8 \\ 2 & 5 & 4 \end{pmatrix}$$

Question 2

Create a program that takes a bimatrix game and returns all pure strategy Nash equilibria. For this you should build a best-response correspondence for each player, and deduce all (pure) strategy profiles that imply players are best-responding to each other.

Question 3

Do this one by hand. Using support enumeration determine all the mixed Nash equilibria of the game given by A and B above.

Question 4

Create a program that outputs all mixed Nash equilibria for any given two player game (A, B) . Assume the game is non-degenerate, so you can focus on supports of the same size. Try the program out with the example game worked out in the class, and the one in questions 2 and 3.