Game Theory (STAT 155) Worksheet #5, 02/22/2021

1. Find the safety strategies and a Nash equilibrium in the following general-sum games:

   (a) $\begin{pmatrix} (1,1) & (4,2) \\ (2,4) & (3,3) \end{pmatrix}$

   (b) $\begin{pmatrix} (1,2) & (4,3) & (4,1) \\ (3,3) & (5,4) & (4,5) \\ (2,5) & (3,5) & (5,6) \end{pmatrix}$

   (c) $\begin{pmatrix} (1,1) & (3,0) & (2,1) \\ (2,0) & (1,3) & (3,0) \\ (3,1) & (2,0) & (1,1) \end{pmatrix}$

2. There are 3 tenants in a house. Each tenant can either participate in cleaning the kitchen or not. The following holds:

   - If someone participates, then the kitchen becomes clean, which results in 5 units of utility for everyone.
   - Cleaning takes 6 units of utility. This payment is distributed equally between all the participants.
   - If a tenant doesn't participate, but both her housemates do, then the tenant feels ashamed, which results in her losing of 3 units of utility.

   Find all the symmetric Nash equilibria in this game.