Project: Theory of Games (Questions)

Due: March, 29th

Solve the following questions:

1. Let a game have the payoff matrix

$$A = \begin{pmatrix} 3 & 5 & -2 & -1 \\ -2 & 4 & -3 & -4 \\ 6 & -5 & 0 & 3 \end{pmatrix}.$$

   (a) If the players R and C use strategies

$$p = \begin{pmatrix} \frac{1}{6} & \frac{1}{3} & \frac{1}{2} \end{pmatrix} \quad \text{and} \quad q = \begin{pmatrix} \frac{1}{4} \\ \frac{1}{4} \\ \frac{1}{3} \\ \frac{1}{6} \end{pmatrix},$$

   respectively, what is the expected payoff of the game ?

   (b) If player C keeps his strategy fixed as in part (a), what strategy should player R choose to maximize his expected payoff ?

   (c) If player R keeps his strategy fixed as in part (b), what strategy should player C choose to minimize the expected payoff to player R.

2. The Federal Government desires to inoculate its citizens against a certain flu virus. The virus has two strains, and it is not known in what proportions of the two strains occur in the virus population. Two vaccines have been developed with different effectiveness against the two strains. Vaccine 1 is 85% is effective against strain 1 and 70% effective against strain 2. Vaccine 2 is 60% effective against strain 1 and 90% effective against strain 2. What inoculation policy should the government adopt ?

[1] **Office hours:** Monday 1:30-3pm, 5-6pm, Wednesday 2:30-3:30pm, Thursday 1:30-3:00pm, Friday: 11:30-12:30 or by appointment.