## STRATEGIC THINKING

## Problem Set 1

*Note: To be handed in by Groups: 2, 4, 6, 8, 10, 12, 20*

1. **Duelling Networks**

   Two television networks, let's call them ABC and XYZ, are battling for shares of total viewers. Viewer shares are important because the higher the viewer share, the greater the amount of money the network can make by selling advertising time on that program.

   Each network can show either a sitcom or a sport event, and the networks make their programming decisions independently and simultaneously. ABC has an advantage in sitcoms: if both networks show sitcoms, then ABC gets a 55% viewer share and XYZ a 45% share. XYZ has an advantage in sport: if both networks show sport, then XYZ gets a 55% share and ABC a 45% share. If ABC shows sport while XYZ shows a sitcom, the shares are evenly split; if ABC shows a sitcom while XYZ shows sport, the shares are 52% : 48%, respectively.

   a. Draw a $2 \times 2$ payoff matrix for this interaction, clearly labelling the players, their choices, and the payoffs.

   b. What is a dominant strategy? Are there any in this game? Explain.

   c. Identify any equilibria, clearly showing why.

2. **Paper, Scissors, Rock**

   A children's game (in various forms) is found around the world—in Australia we call it "Paper, Rock, Scissors." Simultaneously, two kids will each hold up a hand, shaped as paper, or as rock, or as scissors. Paper wins over rock (smothers); rock wins over scissors (blunts); and scissors wins over paper (cuts).

   a. How many possible combinations of play are there in the one-shot game? Choosing values for the rankings of the alternatives for each player, write down the full payoff matrix for this game.

b. What is meant by an "equilibrium" in such a game? Is there an equilibrium in players' actions? Explain.

c. What is a "dominant strategy"? Does either player have a dominant strategy in this game? Explain.

d. Would there be a first-mover advantage if the game were not simultaneous play? Explain.

e. What do you think the appeal of such a game is?

f. Can you think of any adult situations (including market interactions) similar to this game? Explain.


3. **Chicken!**

Consider the game "Chicken!". Two drivers race towards each other down a straight. First driver to veer is the "chicken", and loses face. Of course if neither driver veers, their payoffs are very low. If both veer, then they miss each other, of course. Model this as a simultaneous-play game with two actions: Veer or Straight.

a. Since the players are identical, focus on one. Describe the four outcomes of the $2 \times 2$ payoff matrix, and rank them, from 1 = worst to 4 = best.

b. Is there an Nash equilibrium? (No dice throwing.)

c. Plot the game tree, assuming a first-mover. If the game is sequential instead of simultaneous, is there a first-mover advantage? Explain.

d. How might commitment to one action ("Straight") be established? Why should this be desirable? How does such commitment turn our simultaneous-play game into a sequential-play game with first-mover advantage?

e. Can you think of an economic/managerial strategic interaction which resembles Chicken? Explain.