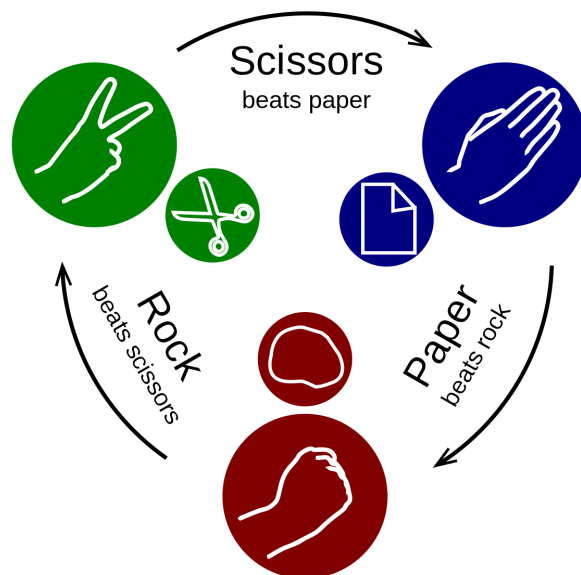


Homework #6

Let's play a game.....

Problem

Rock, Paper, Scissors is a popular game among kids. It is also a good game to study Game Theory, Nash Equilibrium, Mixed Strategies, and Linear Programming.



Procedure

For this assignment, you are asked to compute the **Nash equilibrium for the given zero sum games**. You will be given the reward matrix for Player A. Player B's reward matrix will be the opposite of Player A's matrix. You need to find the ideal mixed strategy for the game. While there are different ways to calculate this we will use Linear Programming in hopes of preparing you for your final project. Use a Linear Programming solver -- such as [CVXOPT](#) -- to create a program that can solve arbitrary Rock, Paper, Scissor games.

You will submit the objective, constraints and strategy for your Linear Program. Much like the previous assignments answers will be graded to a 0.001 precision.

Examples

Given

	Rock	Paper	Scissor
Rock	0	1	-1
Paper	-1	0	1
Scissor	1	-1	0

Calculate

Objective function = ?

Linear constraints = ?

Strategy:

$$\pi_{Rock} = 0.333, \pi_{Paper} = 0.333, \pi_{Scissor} = 0.333$$

Given

	Rock	Paper	Scissor
Rock	0	2	-1
Paper	-2	0	1
Scissor	1	-1	0

Calculate

Objective function = ?

Linear constraints = ?

Strategy:

$$\pi_{Rock} = 0.25, \pi_{Paper} = 0.25, \pi_{Scissor} = 0.5$$

Resources

The concepts explored in this homework are covered by:

- Lectures

- Lesson 11A: Game Theory
- Lesson 11B: Game Theory Reloaded
- Readings
 - Littman (1994)
 - Littman and Stone (2003)

Submission Details

The due date is indicated on the Canvas page for this assignment.

Make sure you have set your timezone in Canvas to ensure the deadline is accurate.

To complete the assignment calculate answers to the specific problems given, and submit results, at <https://rldm.herokuapp.com>

