

# Exercises Set

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- Suppose, to begin with, there are two matches in one pile and a single match in the other pile. Let us write this configuration as  $(2, 1)$ . Winning is preferred to losing and, hence, the payoff number associated with winning must be higher than the one that corresponds to losing; suppose that these numbers are, respectively, 1, and  $-1$ .

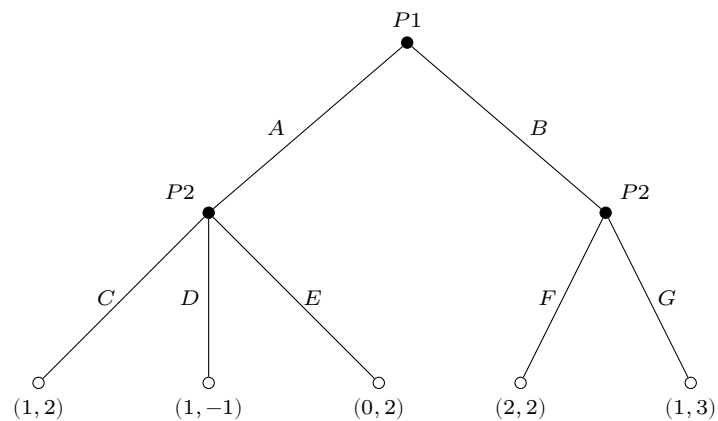
(a) What is the strategic representation of this game?

**Solution:**

1 - 2	$(l, l)$	$(l, r)$	$(r, l)$	$(r, r)$
$u$	$(1, -1)$	$(1, -1)$	$(1, -1)$	$(1, -1)$
$m$	$(-1, 1)$	$(-1, 1)$	$(-1, 1)$	$(-1, 1)$
$d$	$(1, -1)$	$(-1, 1)$	$(1, -1)$	$(-1, 1)$

(b) What is the extensive representation of this game?

**Solution:**



(a) (10 points) List all possible strategies form Players 1 and 2.

**Solution:**

The sets of strategies for players 1 and 2 respectively are  $S_1 = \{(A), (B)\}$ , and  $S_2 = \{(C, F), (C, G), (D, F), (D, G), (E, F), (E, G)\}$ .

- (b) (5 points) List two strategy profiles for this game.

**Solution:** It is a set of strategies for each game,  $(s_1, s_2)$  with  $s_1 \in S_1$  and  $s_2 \in S_2$ .

- (c) (5 points) Find the Nash Equilibrium in pure strategies of this game.

**Solution:** The Nash Equilibria are  $(A, (C, G))$ ,  $(B, (C, G))$ , and  $(B, (E, G))$ .

2. (15 points) Consider the following game tree: