Game Theory: Homework #1

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Collaboration *Replace this text with your collaboration paragraph. Replace this text with your collaboration paragraph. Replace this text with your collaboration paragraph. Replace this text with your collaboration paragraph. Replace this text with your collaboration paragraph. Replace this text with your collaboration paragraph.*

Exercise 1

This is a basic template you can use for your homework submissions for Game Theory. You are welcome to use something prettier of your own making, provided you keep margins and font size as they are in this document.

Make sure you use the correct brackets when typesetting *tuples* such as $G = \langle N, v \rangle$, to distinguish them from *vectors* such as $\boldsymbol{a} = (a_1, ..., a_n)$. Observe that a *Cartesian product* $\boldsymbol{A} = A_1 \times ... \times A_n$ is a set of vectors of this type. Note the use of two different custom-made commands for $\boldsymbol{a}$ and $\boldsymbol{A}$ in the source text, both mapping to the same low-level Typst command. This kind of "semantic typesetting" leads to cleaner documents and, hopefully, fewer mistakes.

You probably already know how to typeset *sets* such as $S = \{k \in \mathbb{N} \mid k \text{ is odd}\}$, *functions* such as $f : \mathbb{N} \to \mathbb{R}$ with $f : x \mapsto \sqrt{x}$ for all $x \in \mathbb{N}$ (note the two different arrows!), and *fractions* such as $\frac{k}{k+\ell}$. Note the use of ℓ instead of l, due to the latter being somewhat difficult to distinguish from a 1. I often find it helpful to explicitly indicate when *multiplication* is taking place, as in $p \cdot q$ (as opposed to pq). There are a number of different approaches to typesetting *equations*. This is one of them:

$$\operatorname*{argmax}_{x \in S} f(x) = \{x \in S \mid f(x) \geq f(y) \text{ for all } y \in S\} \tag{1}$$

Special symbols you might not have come across before include those we are going to use to typeset *preference relations*, as in $C \succ C'$ and $C^* \succeq C$. Wondering how to typeset one of the more exotic Typst symbols? Try https://detypify.quarticcat.com/.

Exercise 2

If an exercise has multiple parts, clearly indicate the start of each part in your answer.

Part (a)

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Part (b)

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Exercise 3

If your answers are very short, then an itemised list might work better.

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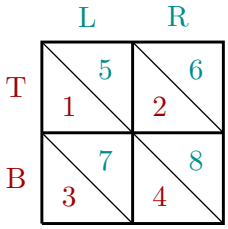
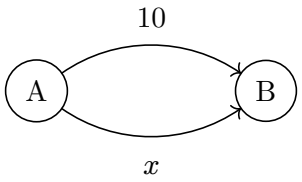
(b) Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat voluptatem. Ut enim aeque doleamus animo, cum corpore dolemus, fieri.

(c) Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam.

Exercise 4

Here are a few more examples for things you might need to typeset yourself:





Here's an example for a numbered theorem:

Nash, 1951 Theorem 1

Every finite normal-form game has a Nash equilibrium.

To refer to this theorem, use a reference by label (as in Theorem 1) rather than to hard-code the number (which only leads to errors). Finally, here's an example for a table:

Name	*Dates*
John F. Nash	1928–2015
Julia Robinson	1919–1985
Lloyd Shapley	1923–2016