

# Microeconomics - Problem Set 1

September 21, 2017

## Exercise 1: A representation on a finite set

Assume rational preferences on a finite set  $X$ .

*Show there is a utility function  $u : X \rightarrow \mathbb{R}$  representing the preferences.*

## Exercise 2: Lexicographic preferences

Assume lexicographic preferences.

*Show the preferences are rational.*

*Show that if a function represents the preferences, then it would not be continuous.*

*Show that such a function does not exist.*

## Exercise 3: Continuous preferences

*If  $u : X \rightarrow \mathbb{R}$  a continuous function represents  $\succeq$ , show that  $\succeq$  is rational and continuous.*

*May a continuous preference be represented by a discontinuous utility function?*

*Show that when the alternatives set is  $\mathbb{R}$ , the preference represented by the ceiling function is not continuous.*