

# Advanced Microeconomics for Policy Analysis I

Fall 2021

## Problem Set 8

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### SOCIAL CHOICE

#### Problem 1.

- a. Suppose we have a group of 4 individuals, a set of alternatives  $A = \{w, x, y, z\}$ , and a Social Welfare Functional  $F$  that they had agreed on. The preferences of these individuals are (these are all strict preferences)

1	2	3	4
$w$	$z$	$w$	$y$
$x$	$x$	$y$	$x$
$y$	$y$	$x$	$z$
$z$	$w$	$z$	$w$

The social ranking determined by  $F$  is:  $x \succ_s y \succ_s z \succ_s w$ .

Suppose that for the following societies this same rule  $F$  stipulates these other rankings:

(i)

1	2	3	4	
$w$	$w$	$z$	$y$	
$x$	$y$	$x$	$x$	$\rightarrow x \succ_s y \succ_s w \succ_s z$
$y$	$x$	$y$	$z$	
$z$	$z$	$w$	$w$	

Does  $F$  satisfy Anonymity? Why?

(ii)

1	2	3	4	
$z$	$w$	$z$	$y$	
$x$	$x$	$y$	$x$	$\rightarrow x \succ_s y \succ_s z \succ_s w$
$y$	$y$	$x$	$w$	
$w$	$z$	$w$	$z$	

Does  $F$  satisfy Neutrality? Why?

(iii)

1	2	3	4	
$x$	$z$	$w$	$y$	
$w$	$w$	$x$	$x$	$\rightarrow x \succ_s z \succ_s y \succ_s w$
$y$	$y$	$y$	$w$	
$z$	$x$	$z$	$z$	

Does  $F$  satisfy Independence of Irrelevant Alternatives? Why?

- b. Show that the Borda Count satisfies (PR). Argue that it also satisfies (A) and (N).
- c. Suppose we have a society composed by 5 individuals,  $i \in \{1, \dots, 5\}$ . The set of alternatives is the interval  $A = [0, 1]$ . Individual  $i$  has preferences  $\succsim_i$  defined on  $A$  represented by a utility function  $u^i(a) = -\left(\frac{i}{5} - a\right)^2$ .  
Is there a Condorcet winner? If yes, which alternative is the Condorcet winner?