Public Economics

Problem set 1

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Exercise 1

Let us consider the following profiles of preferences over 4 alternatives $\{a, b, c, d\}$ by 5 voters:

	Voter 1	Voter 2	Voter 3	Voter 4	Voter 5
Most preferred option	a	b	d	b	c
	b	a	a	a	a
	c	c	b	c	b
Least preferred option	d	d	c	d	d

In other terms, preferences of voter 2 are such that: $b \succ_2 a \succ_2 c \succ_2 d$.

1. Which will be the chosen alternative under pairwise majority voting? How do we name such an alternative?
2. Plurality voting is a scoring rule in which each voter's preferred option is given 1 point an all others none. Show that plurality voting does not select the same alternative as pairwise majority voting.
3. We say that there is strategic voting when individuals have incentives to vote falsely for an alternative that is not they favorite ones, i.e. when they have incentives not to truly reveal their preferences. Show that there is some scope for strategic voting under plurality voting.
4. Forget about strategic voting. Let us now consider voting using a Borda rule. Which option will be selected if the Borda rule assigns 4 points to the preferred option, 3 points to the second one, 2 points to the third one, and 1 point to the last one?
5. Assume that you are voter 2 and that you are in charge of designing to Borda weights. How can you design the rule such as to be better off?

Exercise 2

Sequential pairwise voting is a voting method that consists in a pre-determined sequence of pairwise confrontations. This pre-determined sequence is called a "fixed agenda". The chosen alternative is the one that survives the last pairwise majority vote.

1. Demonstrate that if a Condorcet winner exists, then this alternative will be the chosen one for any possible sequential pairwise voting procedure.

Let us consider the following profiles of preferences over 4 alternatives $\{a, b, c, d\}$ by 3 voters:

	Voter 1	Voter 2	Voter 3
Most preferred option	a	c	b
	b	a	d
	d	b	c
Least preferred option	c	d	a

In other terms, preferences of voter 1 are such that: $a \succ_1 b \succ_1 d \succ_1 c$.

2. Check that there is no Condorcet winner in the above-described situation.
3. Show that is sequential pairwise voting is used and if your have the agenda-setting power, then you can arrange the sequence to ensure whichever alternative you want to be chosen.