Econ 501A HW 2

David Zynda

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Problem 2.3

If succeq is a complete and trasitive preference on a finite set X, then succeq has a utility representation

Let X be a finite set with $\succeq$ as a complete and transitive preference on the set. Then, define subsets of X for each element $x \in X$ such that:

$$W(x) = \{y \in X : x \succeq y\}$$

If X is finite with a complete and transitive preference relation, that means there will be a $W(x)$ since either $x \succeq y$ or $y \succeq x$ which implies $W(x) = y$ or $W(y) = x$. This works as well if X is a singleton since $x \succeq x \implies W(x) = x$.

For transitivity, as usual let $x \succeq y$ and $y \succeq z$. Because the preference is transitive, then: $x \succeq z$. Also allow for $z \succeq t$. This implies, by definition of $W(x)$ that: $W(x) = y$, $W(y) = z$, $W(z) = t$ Then, $y \succeq z$ and $z \succeq t \implies y \succeq t$.

Then for each element in the set X, $W(x)$ returns a set containing all the elements that are as preferred to x and not as preferred to x.

Define a function $u(x) : W(x) \subseteq X \to \mathbb{R}$. Let $u(x)$ return a real number representing the number of elements in $W(x) \subseteq X$.

Problem 3.1

If $\succeq$ is complete, and B containts just two elements then $C_{\succeq}(B)$ is nonempty. Conversely, if $\succeq$ is not complete, there exists some $B \subset X$ containing just two elements such that $C_{\succeq}(B)$ is empty. If $\succeq$ is complete and transitive, $\mathcal{B}$ and $C_{\succeq}$ satisfies finite nonemptiness

Problem 3.2

Problem 3.3

Problem 3.5