

**1.B.5** Show that if  $X$  is finite and  $\succsim$  is a rational preference relation on  $X$ , then there is a utility function  $u : X \rightarrow \mathbb{R}$  that represents  $\succsim$ . [*Hint:* Consider first the case in which the individual's ranking between any two elements of  $X$  is strict (i.e. there is never any indifference) and construct a utility function representing these preferences; then extend your argument to the general case.]