Honours Project

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Project: Extensions of Positive Operators

An element x of an ordered vector space E is called *positive* if $x \geq 0$, where 0 denotes the zero element of E. Interestingly, the collection of all linear operators $T \colon E \to F$ between two ordered vector spaces E and F is itself an ordered vector space. Here such an operator is positive if $T(x) \geq 0$ holds in F whenever $x \geq 0$ holds in E.

In this project, we will investigate how positive operators between two special types of ordered vector spaces, called *vector lattices* or *Riesz spaces*, can be extended to a larger domain. To complete this task, we will study some basic theory of ordered vector spaces and vector lattices, including the most general version of the Hahn-Banach theorem. We will also explore conditions in which extendable positive operators have a smallest, or even a unique, extension.