

# L11 Problem Set 1

- Prove Fact 2 (slide 41).
- Finish the proof that  $\mathbb{M}_n(\mathcal{S})$  is a semiring (slides 38 and 39).
- Show that  $(\mathcal{S}, \oplus_{\mathcal{S}}) \vec{\times} (\mathcal{T}, \oplus_{\mathcal{T}})$  is associative (slide 48). Warning — this is a bit tedious.
- What are the natural orders associated with this construction? Explore.