MATH 595

Homework 2

Exercise 1. Recall that we gave two definitions of a *unital* factorization space: one was that the maps $\mathcal{Y}_{X^I}$ to X^I all have sections u_I compatible with the factorization structure; the other is that we have spaces $\mathcal{Y}_{X^I}$ and maps between them for all objects and morphisms in the category of finite sets with functions between them (as compared to finite non-empty sets with surjections). Prove that these definitions are equivalent.

Exercise 2. Let $\mathcal{A}$ and $\mathcal{B}$ be two chiral algebras. Can you define a chiral bracket on their tensor product $\mathcal{A} \otimes^! \mathcal{B}$?

Exercise 3. Let $\mathcal{A}$ be a chiral algebra on a curve X, and let $\phi : Y \to X$ be an étale morphism of curves. Can you define a chiral bracket on the $\mathcal{D}_Y$-module $\phi^* \mathcal{A}$?