A Note on Multicategories

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In categorical logic it is customary to model sequents of the form $A_1, \ldots, A_n \vdash B$ in a monoidal category as morphism $f : [\![A_1]\!] \otimes \cdots \otimes [\![A_n]\!] \rightarrow [\![B]\!]$. For example, modeling propositional intuitionistic logic requires the monoidal category to be at least cartesian, and $\otimes$ to be the cartesian product, while modeling a sequent in propositional linear logic requires only tensor. This works well, but what if the logic one is seeking to model categorically does not have a suitable notion of a tensor product that can model the left-hand side of sequents? Then the notion of a multicategory just might be the structure suitable for such a model.

In an ordinary category morphisms have by definition only a single source object and a single target object. Multicategories generalize morphisms to have multiple source objects denoted $f : X_1, \ldots, X_n \rightarrow Y$.

References

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