Assignment 3

Ross Tate

February 14, 2018

Exercise 1. Suppose we were to make two modifications to **LMet**:

1. Drop the requirement on objects that distance functions satisfy point and triangle inequality.
2. Add the requirement on morphisms that functions preserve distances *exactly*, i.e. $d_X(x, x') = d_Y(f(x), f(x'))$.

The resulting modified category can be defined concisely as a particular comma category. Determine which standard categories and functors $\mathbf{A}_1 \xrightarrow{F_1} \mathbf{B} \xleftarrow{F_2} \mathbf{A}_2$ have the property that $F_1 \downarrow F_2$ is (isomorphic to) this modified category and briefly illustrate the reasoning.