

**Definition (Tup).** There exists a category **Tup** that consists of the following constituents:

1. *Objects:* The objects of **Tup** are lists of sets.
2. *Morphisms:* The morphisms of **Tup** are maps between tuples. A morphism from  $[a_1, \dots, a_p]$  to  $[b_1, \dots, b_q]$  is a  $q$ -tuple of morphisms  $[f_1, \dots, f_q]$  where  $f_i : a_1 \times \dots \times a_n \rightarrow b_i$ .
3. *Identity morphism:* The identity morphism are the products in sets.
4. *Composition operation:* Composition is given by function composition in the obvious way.