Definition. *Category*

*A category consists of a class of **objects***

$$A, B, C, \cdots$$

*and a class of **morphisms***

$$f, g, h, \cdots$$

for which the following axioms are fulfilled:

*(1) To each morphism f there exists operators called **domain**, **codomain** and denoted by*

$$dom(f), \quad cod(f)$$

Each operator associates an object to f.

*(2) If for two morphisms f and g we have $cod(f) = dom(g)$, then there exists a morphism named **composition** of f and g which is denoted by $g \circ f$. Moreover, we have*

$$dom(g \circ f) = dom(f)$$

$$cod(g \circ f) = cod(g)$$

*(3) For each object A there exists an morphism named **identity**, denoted by*

$$id_A$$

and that fulfills $dom(id_A) = A$ and $cod(id_A) = A$.

*(4) The composition is required to be **associative**, that is, for any morphisms f, g, h*

$$(f \circ g) \circ h = f \circ (g \circ h)$$

given that the compositions are defined.

(5) Composing a morphism f that has $dom(f) = A$ and $cod(f) = B$ with corresponding identities, fulfills

$$id_B \circ f = f = f \circ id_A$$