Definition (Semicategory). A *semicategory* $\mathbf{C}$ is:

Constituents

1. Objects: a collection $\mathrm{Ob}_{\mathbf{C}}$, whose elements are called *objects*.
2. Morphisms: for every pair of objects $X, Y \in \mathrm{Ob}_{\mathbf{C}}$, there is a set $\mathrm{Hom}_{\mathbf{C}}(X; Y)$, elements of which are called *morphisms* from X to Y. The set is called the "hom-set from X to Y".
3. Composition operations: given any morphism $f \in \mathrm{Hom}_{\mathbf{C}}(X; Y)$ and any morphism $g \in \mathrm{Hom}_{\mathbf{C}}(Y; Z)$, there exists a morphism $f \fatsemi g \in \mathrm{Hom}_{\mathbf{C}}(X; Z)$ which is the *composition of f and g*.

Conditions

1. Associativity: for any morphisms $f \in \mathrm{Hom}_{\mathbf{C}}(X; Y)$, $g \in \mathrm{Hom}_{\mathbf{C}}(Y; Z)$, and $h \in \mathrm{Hom}_{\mathbf{C}}(Z; W)$,

$$(f \fatsemi g) \fatsemi h = f \fatsemi (g \fatsemi h).$$