Monoidal-Annex

Preston Keel

Dr. Harley Eades

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1 Monoidal Categories

Definition 1.

2 Symmetric Monoidal Categories

Definition 2. A symmetric monoidal catergory (SMC), $(\mathbb{C}, \otimes, I, \alpha, \lambda, \rho, \gamma)$, is a category \mathbb{C} equippped with a bifunctor $\otimes : \mathbb{C} \times \mathbb{C} \to \mathbb{C}$ with a neutral element I and natural isomorphisms α, λ, ρ , and γ :

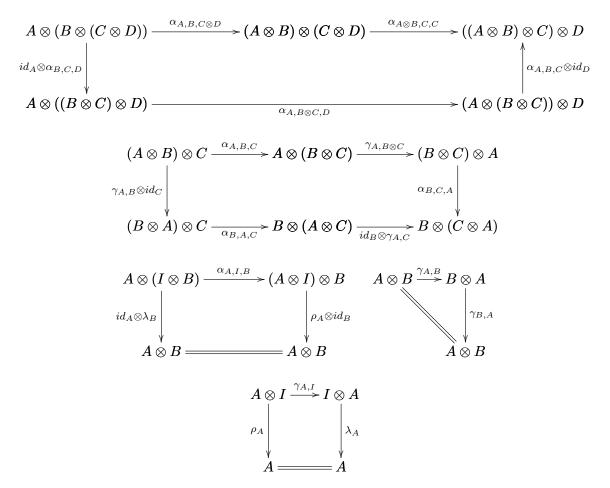
1.
$$\alpha_{A,B,C}: A \otimes (B \otimes C) \xrightarrow{\sim} (A \otimes B) \otimes C$$

2.
$$\lambda_A: I \otimes A \xrightarrow{\sim} A$$

3.
$$\rho_A: A\otimes I \xrightarrow{\sim} A$$

4.
$$\gamma_{A,B}: A \otimes B \xrightarrow{\sim} B \otimes A$$

which make the following 'coherence' diagrams commute.



The following equality is also require to hold:

$$\lambda_I = \rho_I : I \otimes I \to I$$

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Definition 3. A symmetric monoidal closed category (SMCC), $(\mathbb{C}, \otimes, \neg, I, \alpha, \lambda, \rho, \gamma)$, is a SMC such that for all objects A in \mathbb{C} , the functor $-\otimes A$ has a specified right adjoint $A \multimap -$.

References