Lecture Notes in Category Theory

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1.4.1 Definition

Definition 1 *We call* adjunction *an ordered pair* (F, G) *where* F *is a functor* $F : \mathcal{C} \to \mathcal{D}$ *and* G *is a functor* $G : \mathcal{D} \to \mathcal{C}$ *while* $\mathcal{C}$ *and* $\mathcal{D}$ *are two locally-small categories for which there exists a natural isomorphism:*

$$\alpha : \mathcal{D} \circ (F \times I_{\mathcal{D}}) \Rightarrow \mathcal{C} \circ (I_{\mathcal{C}^{op}} \times G)$$

in the functor category $[\mathcal{C}^{op} \times \mathcal{D}, \mathcal{S}et]$*, where* F *also denotes* $F : \mathcal{C}^{op} \to \mathcal{D}^{op}$*.*