

**Definition** (Codiagonal function). Define the *codiagonal function*  $\text{codiag}_{\mathbf{P}} : \mathbf{P} + \mathbf{P} \rightarrow \mathbf{P}$ :

$$\text{codiag}_{\mathbf{P}} : \mathbf{P} + \mathbf{P} \rightarrow \mathbf{P},$$

$$\langle 1, p \rangle \mapsto p,$$

$$\langle 2, p \rangle \mapsto p.$$