Quantizer
$$\mathcal{Q}: \mathcal{X} \mapsto \mathcal{C}$$
 $\mathbf{x}_i = \mathbf{y}_k$ Encoder Decoder $\mathbf{x}_i = \mathbf{y}_k$ $\mathcal{X} = \{\mathbf{x}_i \in \mathbb{R}^D \mid i = 1, 2, \dots, N\}$

 $\mathcal{C} = \{ \mathbf{y}_k \in \mathbb{R}^D \mid k = 1, 2, \dots K \}$