$$\text{---}\boxed{\hat{H}}\text{---} \quad \Longleftrightarrow \quad \hat{H} = \frac{1}{\sqrt{d}} \sum_{j,k=0}^{d-1} \omega_d^{k(d-j)} |j\rangle\langle k|, \quad \omega_d = e^{\frac{2\pi i}{d}}$$