

# Quantum Computation and Quantum Information

## Assignment 3

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**Exercise 1.2**

Explain how a device which, upon input of one of two non-orthogonal quantum states  $|\psi\rangle$  and  $|\varphi\rangle$  correctly identified the state, could be used to build a device which cloned the states  $|\psi\rangle$  and  $|\varphi\rangle$ , in violation of the non-cloning theorem. Conversely, explain how a device for cloning could be used to distinguish non-orthogonal quantum states.