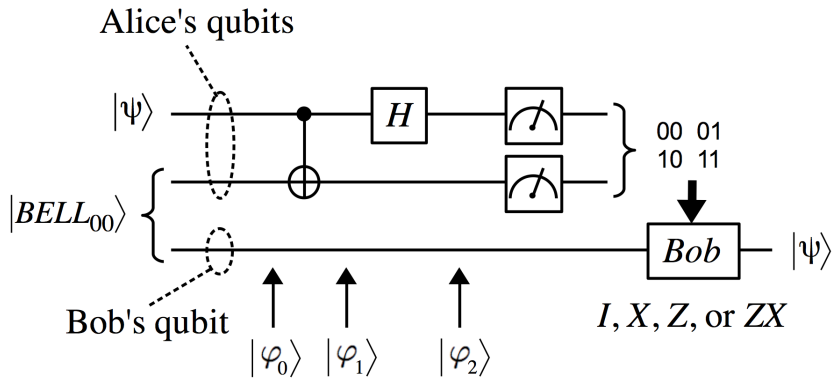
Assignment 17

Due by class time Thursday, November 17

1. As a reminder, here is the quantum teleportation diagram we discussed in class:



Suppose that when Alice and Bob created their entangled pair of qubits back in graduate school, the qubits ended up in the state $|BELL_{10}\rangle = \frac{1}{\sqrt{2}}|00\rangle - \frac{1}{\sqrt{2}}|11\rangle$, instead of the state $|BELL_{00}\rangle$. How would this affect the quantum teleportation algorithm? Work out the steps required for Alice to teleport her qubit $|\psi\rangle$ to Bob in this case, showing clearly the intermediate 3-qubit states $|\varphi_0\rangle$, $|\varphi_1\rangle$, and $|\varphi_2\rangle$, and the actions that Bob should perform on his qubit in response to Alice's measurement.