Hand In 1

FYST85

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1 First Exercise

Problem: Consider the following two-qubit state:

$$\frac{1}{2}|00\rangle + \frac{1}{\sqrt{2}}|10\rangle + \frac{1}{\sqrt{2}}|11\rangle$$

A. Show that the state is normalized.

B. If you make a measurement on the first qubit and obtain the result $|0\rangle$, what is now the two-qubit state after this measurement?

C. Suppose that you instead obtained the result $|1\rangle$, what is now the two-qubit state after this measurement? (Remember to answer as a normalized state)

D. Is the original state an entangled state?