CS 1511 Homework 23

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45. Extra credit ...

46. BQP is the complexity class that contains languages that are solvable by a quantum computer in polynomial time with an error probability of 1/3.

Add another qubit to the register. When the qubit is zero, all amplitudes correspond to the real part of the amplitudes in the original algorithm. When it is one, the amplitudes correspond to the imaginary part of the amplitudes of the original algorithm.

This means that the states can be either the real part or imaginary part of the matricies. The state of them depends of the state of the qubit. This is because of the linearity of the matrix operations. The real or imaginary part can be chosen based on the qubit.