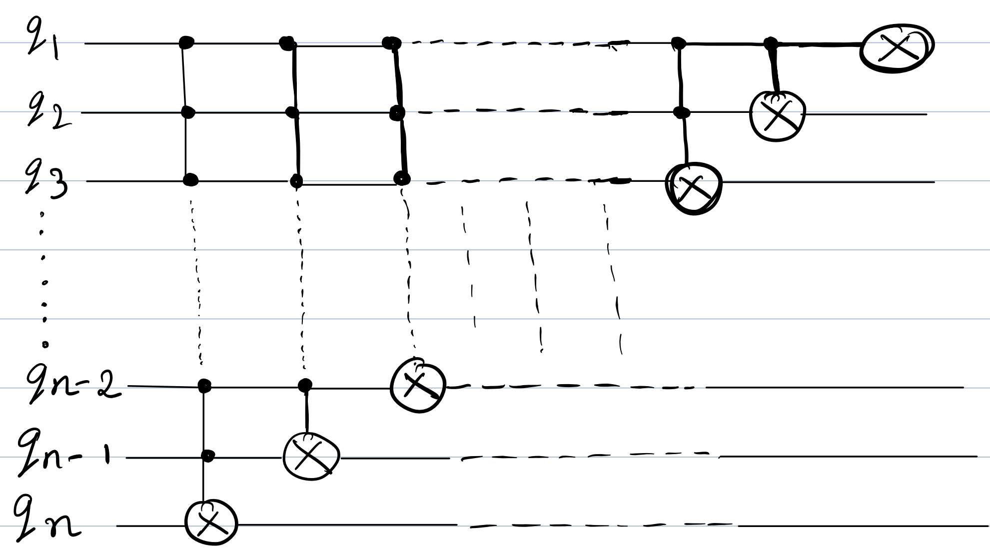

q1
q2
q3
qn-2
qn-1
qn

$$\frac{1}{\sqrt{2^n}} \sum_{x=0}^{2^n-1} |x\rangle$$ Original State

$$n=1, \quad \frac{1}{\sqrt{2}}\left(|0\rangle + |1\rangle\right) \overset{inc}{=} \frac{1}{\sqrt{2}}\left(|1\rangle + |0\rangle\right)$$

$$n=2, \quad \frac{1}{2}\left(\underset{0}{|00\rangle} + \underset{1}{|01\rangle} + \underset{2}{|10\rangle} + \underset{3}{|11\rangle}\right)$$

$$\overset{inc}{=} \frac{1}{2}\left(\underset{1}{|01\rangle} + \underset{2}{|10\rangle} + \underset{3}{|11\rangle} + \underset{0}{|00\rangle}\right)$$

$$n=3, \quad \frac{1}{2\sqrt{2}}\left(\overset{0}{|000\rangle} + \overset{1}{|001\rangle} + \overset{2}{|010\rangle} + \overset{3}{|011\rangle} + \overset{4}{|100\rangle} + \underset{5}{|101\rangle} + \underset{6}{|110\rangle} + \underset{7}{|111\rangle}\right)$$

$$\overset{inc}{=} \frac{1}{2\sqrt{2}}\left(\overset{1}{|001\rangle} + \overset{2}{|010\rangle} + \overset{3}{|011\rangle} + \overset{4}{|100\rangle} + \overset{5}{|101\rangle} + \underset{6}{|110\rangle} + \underset{7}{|111\rangle} + \underset{0}{|000\rangle}\right.$$

After applying n-qubit incrementer to the original state, there is no change as the the qubit state as we do not make use of carry. Only the order gets jumbled which does not affect the state in any way.