

## Lab15

Consider a 3 qubit Grover's search algorithm.

1. What is the number of qubits in the output?

Answer: 3

2. How many different numbers can be fed to the algorithm?

Answer: 8

3. What is the size of the matrix associated with the oracle?

Answer: 8x8

4. What is the size of the matrix associated with the diffusion operator?

Answer: 8x8

5. What is the optimum number of steps for the algorithm?

Answer: 2

Let's assume the solution for the 3-qubit search is 6.

6. What is the content of the matrix associated with the oracle?

Answer:

1	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0
0	0	1	0	0	0	0	0
0	0	0	1	0	0	0	0
0	0	0	0	1	0	0	0
0	0	0	0	0	1	0	0
0	0	0	0	0	0	-1	0
0	0	0	0	0	0	0	1

**7. What is the content of the matrix associated with the diffusion operator?**

Answer:

<b>-3/4</b>	1/4	1/4	1/4	1/4	1/4	1/4	1/4
1/4	<b>-3/4</b>	1/4	1/4	1/4	1/4	1/4	1/4
1/4	1/4	<b>-3/4</b>	1/4	1/4	1/4	1/4	1/4
1/4	1/4	1/4	<b>-3/4</b>	1/4	1/4	1/4	1/4
1/4	1/4	1/4	1/4	<b>-3/4</b>	1/4	1/4	1/4
1/4	1/4	1/4	1/4	1/4	<b>-3/4</b>	1/4	1/4
1/4	1/4	1/4	1/4	1/4	1/4	<b>-3/4</b>	1/4
1/4	1/4	1/4	1/4	1/4	1/4	1/4	<b>-3/4</b>

**8. Implement the search for this solution using Strange, and render the circuit.**

Answer: ...