Quantum computing

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Topic	Concept	Example 1	Example 2
1. Quantum mechanics background	✓		
1.1 Probability			
1.2 Superposition			
1.3 Entanglement			
1.4 Matrices			
1.4.1 Eigenvalues and eigenvectors			
1.4.2 Invertible, adjoint, hermitian			
1.5 Hidden subgroups			
2. Quantum computation	✓		
2.1 Quantum supremacy			
2.2 Bell states			
2.3 Hadamard			
3. Algorithms	✓	✓	
3.1 Grover's algorithm			
3.1.1 Search			
3.2 Deutsch-Jozsa algorithm			
3.2.1 Constant or balanced			
3.3 Shor's algorithm			
3.3.1 Factoring			

Topic	Concept	Example 1	Example 2
4. Hardware	✓		
4.1 Qubits			
4.2 Quantum circuits			
4.3 Photons			
4.4 Nuclear magnetic resonance	✓		
4.5 Ion traps			
4.6 Environmental necessities			
4.6.1 Interference			
4.6.2 Decoherence			
4.6.3 Temperature			
5. Software	✓	✓	
5.1 Computer languages			
5.1.1 Python			
5.1.2 Q#			
6. Applications	✓		
6.1 Optimization			
6.2 Search			
6.3 Factoring and RSA			
6.4 Quantum key distribution			

1. Quantum mechanics

1. When a particle is in a superposition, what does this mean?

2. Quantum computation

3. Algorithms

4. Hardware

1. If you were to build a quantum computer, how would you build it?

5. Software

6. Applications