

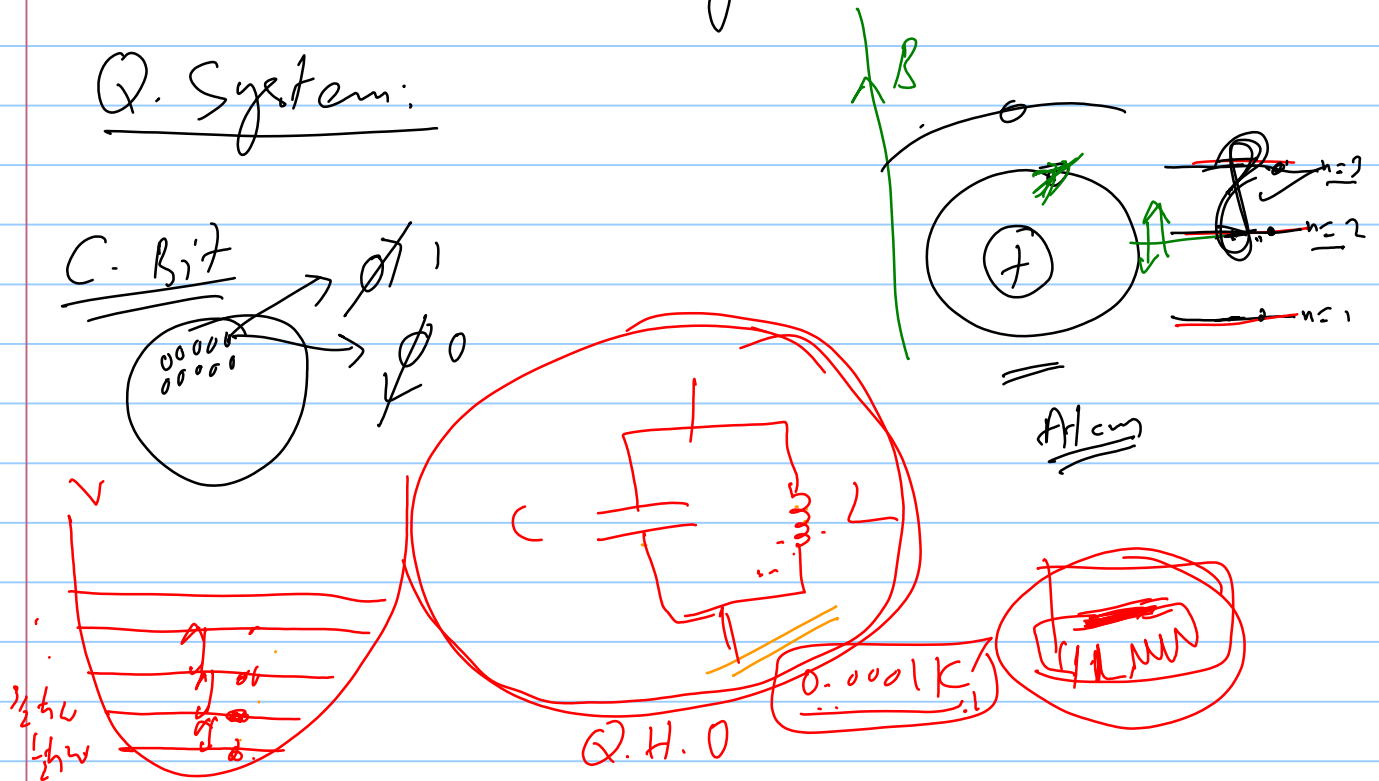
→ Quick Introduction to Q.C.

- Q.C.
- Qubits
- Q. Gates / Algorithms
- Applications
- Why Q.C. are better

Q. Computers:

- - represent info on Q. systems
- - process this q. info
- - Measure the info

Q. System:

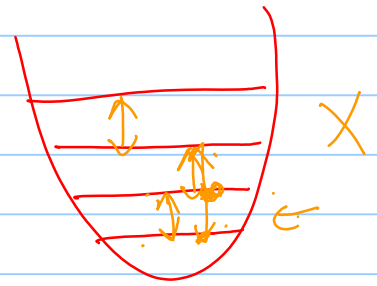


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 $\rightarrow \underbrace{000000000000}_{\text{}} \underbrace{\quad\quad\quad}_{\text{}}$

For Q.C: Only two level Q. System

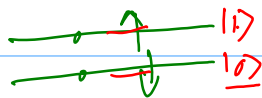
Nature: No true-two-level Q. System



QUBIT

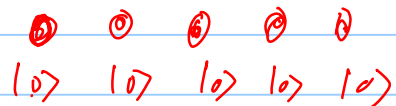


spin system!



Derived properties of Qubits (Q.C.)

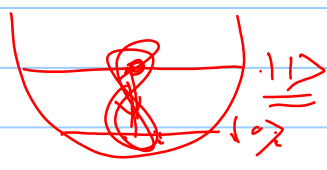
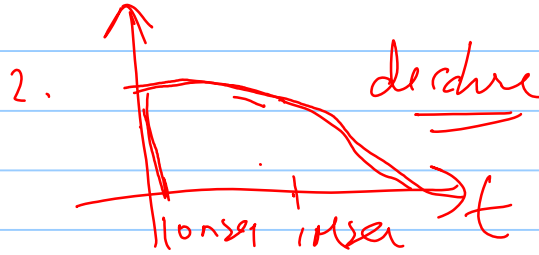
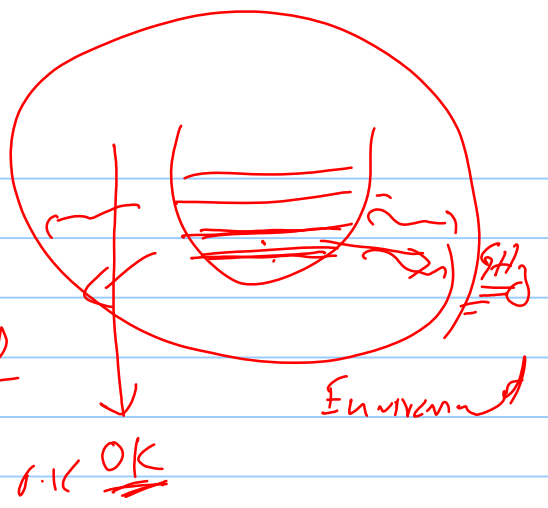
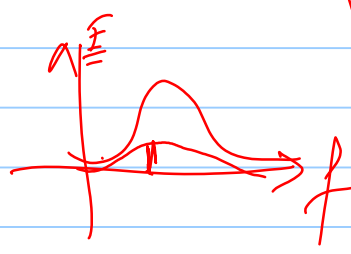
1. Initialize



2. Errors as low as possible

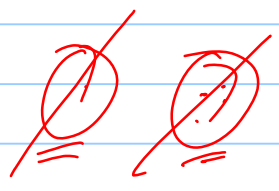
Source

$\approx T$

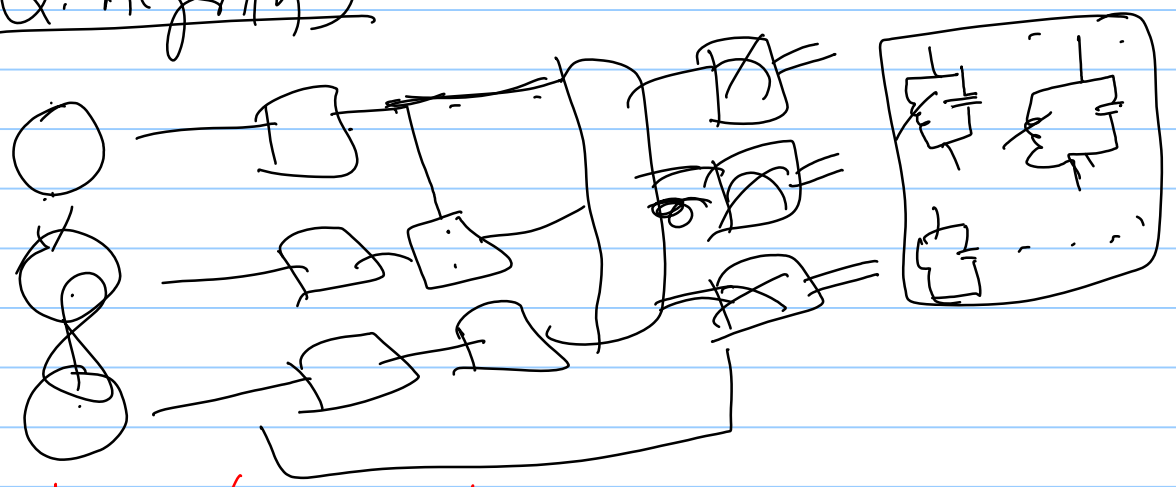


3. M. errors

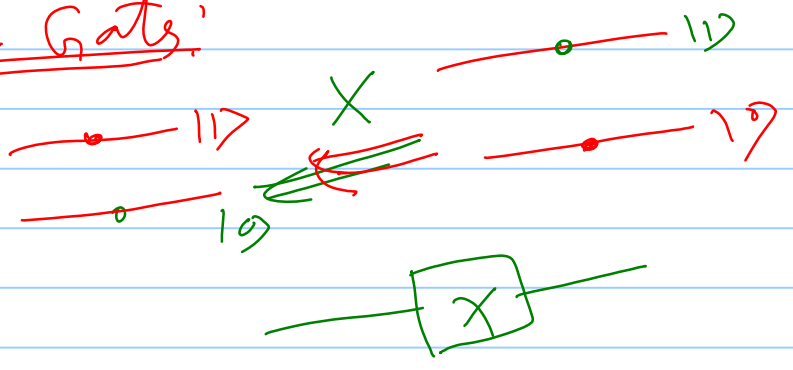
4. Entangling period

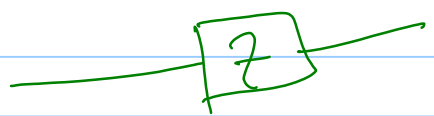
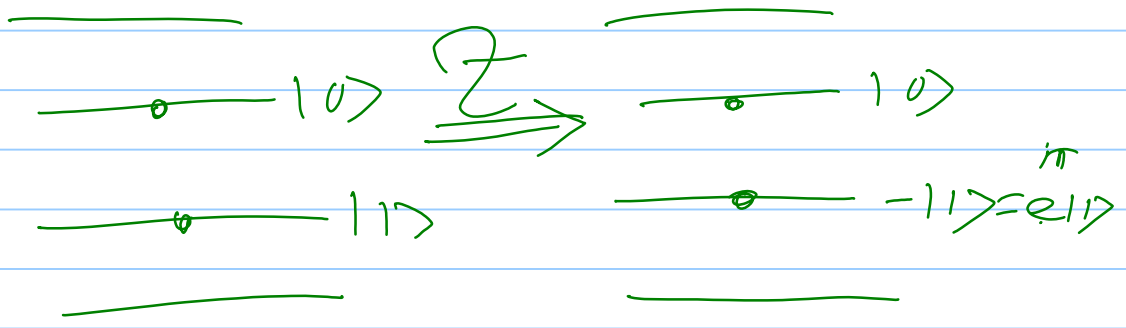


• Q. Algorithm



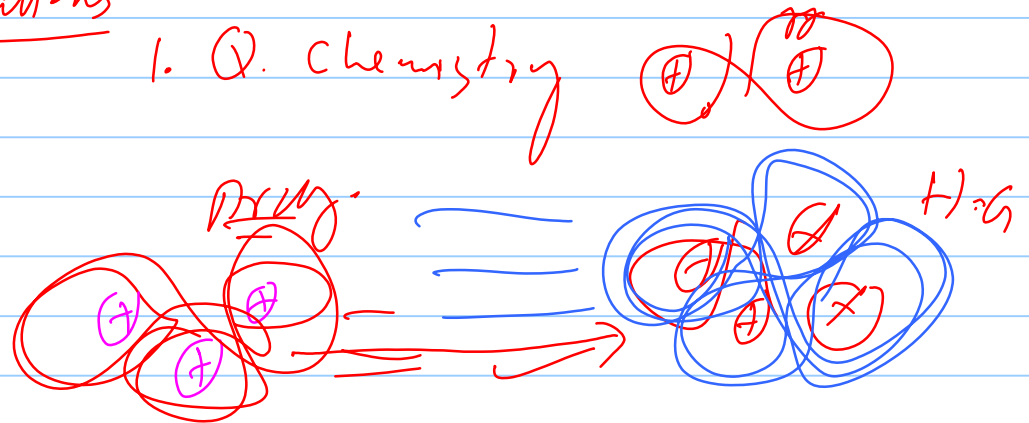
Ind op. / Q. Gate:





Applications

1. Q. Chemistry



- Searching ✓
- F.T. → Factoring
- Q.M.L
- Q. Algebra
- Optimization QAOA