0.1 More Notes

1. A coordinate transformation is a linear operation.
2. That a matrix can be composed of output bases is a property of input bases e_i, and that the requires input bases e_i and the transformation to be into the same vector space.
3. In matrix multiplication, the number of columns out of the left matrix and the number of rows in the right matrix have to be equal.
4. Also, the number of rows of the left matrix gives the number of rows of the resultant matrix.
5. The number of columns of the right matrix gives the number of columns of the resultant matrix.
6. 'unitary transformation' of a "state vector" can be physically interpreted as the 'time evolution' of "an isolated quantum mechanical system":
7. Unitary transformation
   (a) Reversible transformation
   (b) inverse is adjoint
8. Reversible operations are the only operations we concern ourselves with so far as quantum computation and quantum information is concerned
9. unitary operations are the only operations possible for evolution.
10. We will deal with only finite-dimensional Hilbert space.
11. projection of a vector on another vector can be obtained by an inner product.
12. linear means matrix (scalar (vector)) = scalar (matrix (vector))
13. inner product needs linearity

0.2 unitary operator

1. Unitary transformation depends only on initial and final state.
2. why does it not depend on the intermediary at time stamps or states? How do we know that it doesn't? Is it odd that it doesn't?
3. Does the unitary operator depend on the initial timestamp or does it depend on the initial state vector and the final state vector?
4. How to find all unitary operators of a given dimension.