## Step-1

Let *a* and *b* are input vectors.

If  $q_1, q_2$  are the outputs from Gram-Schmidt process

Then 
$$q_1 = \frac{a}{\|a\|} \quad q_2 = \frac{c}{\|c\|} \quad \text{where } c = b - (q_1^T b) q_1$$

That is, a and b can be any two vectors in the subspace spanned by  $q_1$  and  $q_2$  .

 $\hat{A} \; \hat{A} \; \hat{A} \; \hat{A}$