

# Lec 10: The Four fundamental subspaces.

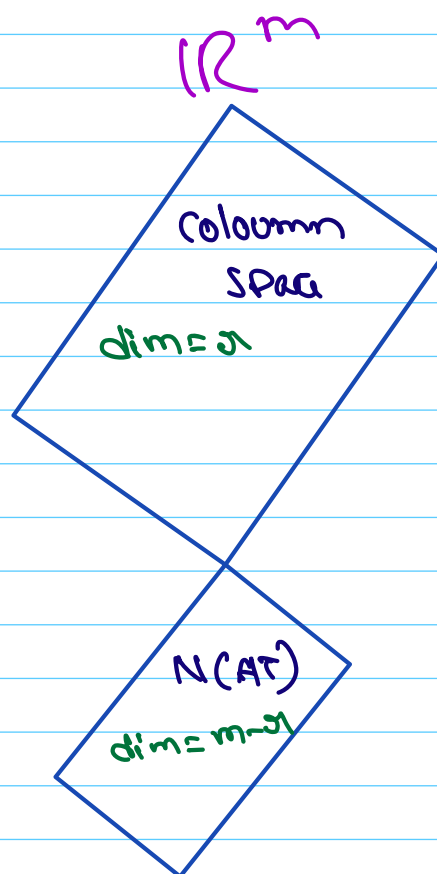
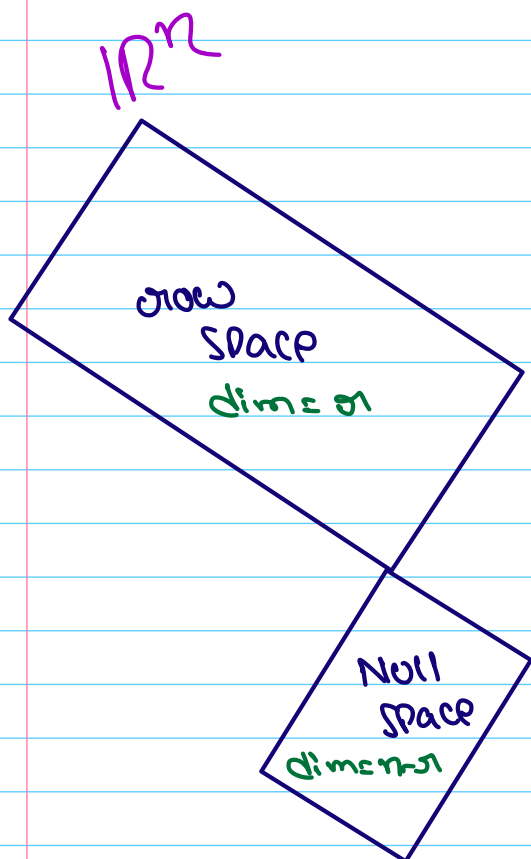
$A$  is  $m \times n$

Column space  $C(A)$  in  $\mathbb{R}^m$

Null space  $N(A)$  in  $\mathbb{R}^n$

Row space  $C(A^T)$  in  $\mathbb{R}^n$

Null space of  $A^T = N(A^T)$   
(Left Null space) in  $\mathbb{R}^m$



we would like to know  
BASIS for  $u$  spaces?  
Dimension?