***A*** is ***n*** by ***n***

***Nonsingular Singular***

***A*** is invertible ***A*** is not invertible

The columns are independent The columns are dependent

The rows are independent The rows are dependent

The determinant is not zero The determinant is zero

 has one solution   has infinitely many solutions

 has one solution   has no solution or infinitely many

***A*** has *n* (nonzero) pivots ***A*** has *r* < *n* pivots

***A*** has full rank *r* = *n* ***A*** has rank *r* < *n*

The reduced row echelon form is *R* = *I* *R* has at least one zero row

The column space is all of The column space has dimension *r* < *n*

The row space is all of The row space has dimension *r* < *n*

All eigenvalues are nonzero Zero is an eigenvalue of ***A***.

Is symmetric positive definite is only semidefinite

***A*** has *n* (positive) singular values ***A*** has *r* < *n* singular values