

$$3x + 4y + 5z = 0$$

$x, y, z$  are unique??

$$4x + 3y + 6z = 0$$

Null vector !!

up to scale

$$3x + 4y + 5z = 0$$

$$4x + 3y + 6z = 0$$

$$5x + 7y + 8z = 0$$

$x, y, z$  are unique??

$$A = \begin{bmatrix} 3 & 4 & 5 \\ 4 & 3 & 6 \\ 5 & 7 & 8 \end{bmatrix} \quad b = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad Ab = 0$$

A is non-singular

$$b = \text{null vector} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

$$3x + 4y + 5z = 0$$

$$4x + 3y + 6z = 0$$

$$6x + 8y + 10.01z = 0$$

$$A = \begin{bmatrix} 3 & 4 & 5 \\ 4 & 3 & 6 \\ 6 & 8 & 10.01 \end{bmatrix}$$

still non-singular.

$$[U, S, V] = \text{Svd}(A)$$

```
>> A = [3 4 5; 4 3 6; 6 8 10.01]
```

```
A =
    3.0000    4.0000    5.0000
    4.0000    3.0000    6.0000
    6.0000    8.0000   10.0100
```

```
>> [U, S, V] = svd(A)
```

```
U =
   -0.4019    0.1967   -0.8943
   -0.4379   -0.8990   -0.0010
   -0.8042    0.3912    0.4475
```

```
S =
   17.5794         0         0
         0    1.4716         0
         0         0    0.0027

V =
   -0.4427   -0.4477   -0.7769
   -0.5321    0.8285   -0.1743
   -0.7217   -0.3363    0.6050

>> A*V(:,3)
ans =
   -0.0024
   -0.0000
    0.0012
```