## Step-1

We have to find that which number b leads later to a row exchange, which number b leads to a missing pivot, and in that singular case we have to find a non-zero solution x, y, z:

$$x + by = 0$$

$$x-2y-z=0$$

$$y + z = 0$$

## Step-2

After eliminating first pivot when applying (row2)  $\hat{a}\in$  (row 1) the second pivot position will contain -2-b

If b = -2, we exchange with row 3 since the system is

$$x-2y = 0$$

$$x - 2y - z = 0$$

$$y + z = 0$$

So we can exchange row 3 if b = -2

## Step-3

If b = -1, the second equation is -y - z = 0. And the system is

$$x - y = 0$$

$$x - 2y - z = 0$$

$$y + z = 0$$

Performing (row 2) – (row1) gives

$$x-y = 0$$

$$-y-z=0$$

$$y + z = 0$$

## Step-4

Adding (row 3) + (row 2) give

$$x-y = 0$$

$$-y-z=0$$

To solving these equations by letting x = y = 1, one of the solutions is (1,1,-1)