

## Step-1

Given that every invertible linear transformation can have  $I$  as its matrix.

We have to choose  $w_i = T(v_i)$  for the output basis.

We have to verify why  $T$  must be invertible.

## Step-2

Suppose  $T$  is not invertible.

Then  $T(v_1), T(v_2), \dots, T(v_n)$  will not be a basis.

Then we could not choose  $w_i = T(v_i)$  as output basis.

Hence  $T$  must be invertible.