Matrix L^{-1}:

- Decompositions:

$$u = P \cdot u + m$$
$$u = L \cdot m$$

} both decompositions of the same vector u

$$\Rightarrow u - P \cdot u + m = L \cdot m$$

$$\Rightarrow P \cdot u = L \cdot m - m = (L - I)m$$

- Solve both decompositions for m

$$\rightarrow m = u - Pu = (I - P) \cdot u$$
$$m = L^{-1} \cdot u$$

} both equations hold for the same m

$$\Rightarrow (I-P) \cdot u = L^{-1} \cdot u$$

$$L^{-1} = (I - P)$$

where I is the identity matrix and P is the matrix from the simple decomposition