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According to lecture slides,the aim of this problem is to solve a LSQ problem using QR decomposition.

Our LSQ problem is r(x) = Jx – y and the goal of the optimization problem is to solve the following minimization problem:

=arg min

Where m>=n . And J and y are both independent of x.

The solution by QR factorization is :

1. Performing the QR decomposition which leads to”

JП=Q=[ ]=R

* Where П is an n\*n permutation matrix
* Q is m\*m orthogonal matrix
* and contain the first n and last m-n columns of Q
* R is n\*n upper triangular with positive diagonal elements.

1. Applying triangular substitution to get solution.

Rz=y z= y and = Пz

In MATLAB, solving Rz=y is suggested to be solved like R\y as it is more accurate and faster.

Solving the numerical stability issue when are so close to zero.