Comparison of normal equations and QR Factorization to find the least squares solution

QR decomposition yields a better result than the normal equations, because although QR is more computationally expensive (when m >> n), it is more robust.

This is because normal equations compute the least square solution to an overdetermined system of equations by computing A\*AT. As far as the condition number of the system is concerned, this is essentially computing A2, which means that the condition number is squared. As a result, this causes the condition number of the problem to increase dramatically.

Thus, QR decomposition yields better results with less well-conditioned matrices.

https://ssl.gstatic.com/ui/v1/icons/mail/images/cleardot.gif

<https://www.cs.cornell.edu/~bindel/class/cs3220-s12/notes/lec10.pdf>

<https://www.quora.com/Is-it-better-to-do-QR-Cholesky-or-SVD-for-solving-least-squares-estimate-and-why>

<https://math.stackexchange.com/questions/2339079/qr-factorization-for-solving-least-squares>