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MATH 2605  
31 March 2015

### Part 1: The Hilbert Matrix

It is justified to use the LU or QR-factorizations as opposed to calculating an inverse matrix because both LU and QR-factorization are four times more efficient than calculating an inverse matrix<sup>1</sup>.

- . Why is it justified to use the LU or QR-factorizations as opposed of calculating an inverse matrix?
- (ii) What is the benefit of using LU or QR-factorizations in this way? (Your answer should consider the benefit in terms of conditioning error.)

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<sup>1</sup> Title: Computational Time for Finding the Inverse of a Matrix: LU D[...]