Week8

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1 QBUSS1040 Week 8 Outline

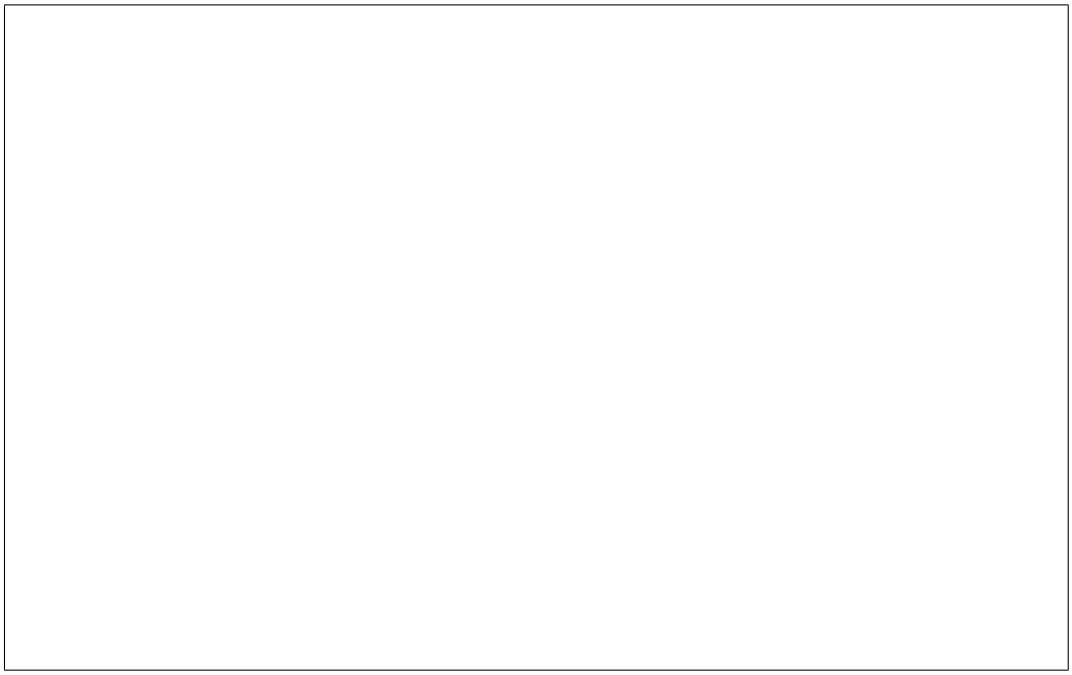
Author: Chenfei

Outline:

1. Exam questions
2. Summary table of matrix inverse
3. Solve system of linear equations via QR
    - Numerical example
    - Coding
4. Problem 3: Middle Inverse

1.1 Exam questions

- Q2



- Q3

- Q7

1.2 Matrix Inverse

1.3 Solve linear equations

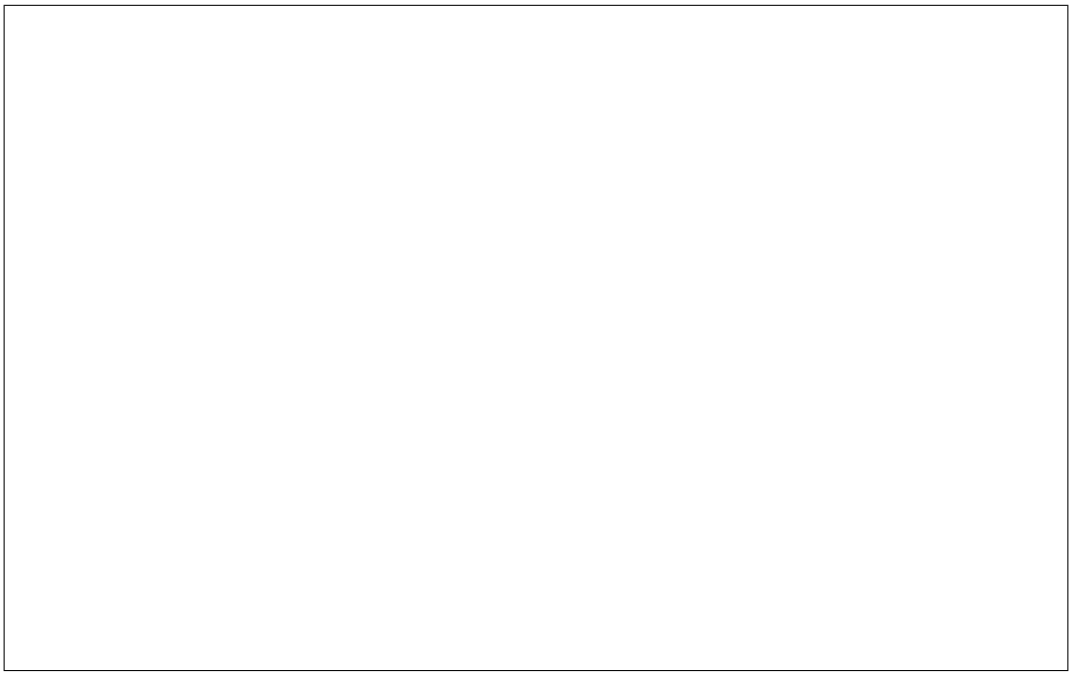
1.3.1 Review

Assume matrix A is an **invertible** square or tall matrix with linearly independent columns. A has m rows and n columns,

$$Ax = b \tag{1}$$

$$QRx = b \tag{2}$$

Back substitution Algorithm 11.1 (Page 207)



Complexity?

1.3.2 Numerical example

(Page 216)

$$\begin{bmatrix} -3 & -4 \\ 4 & 6 \\ 1 & 1 \end{bmatrix} \mathbf{X} = \begin{bmatrix} 1 \\ -2 \\ 0 \end{bmatrix} \tag{3}$$

Another example, what is your finding?

$$\begin{bmatrix} 1 & 3 \\ 2 & 4 \\ 0 & 0 \end{bmatrix} \mathbf{X} = \begin{bmatrix} 5 \\ 6 \\ 7 \end{bmatrix} \tag{4}$$

1.3.3 Coding

1. Copy the QR file from previous week's tutorial.
2. Code the back substitution function.

1.4 Middle inverse