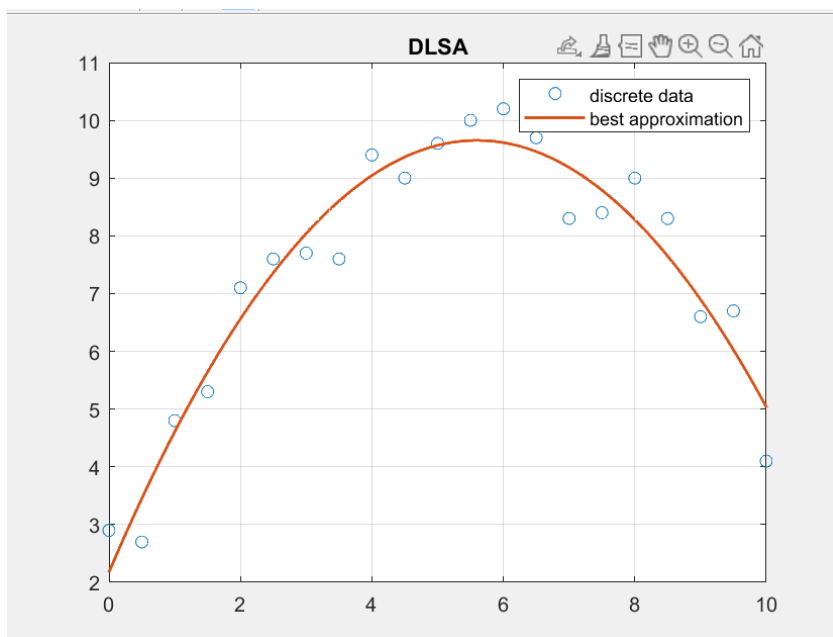


Programming report Chapter 5

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A : Solving the equation by $Ga = c$, then we get the coefficient $a = (2.1757, 2.6704, -0.2384)^T$, therefore the best approximation polynomial is $\hat{\varphi} = -0.2834x^2 + 2.6704x + 2.1757$.



B : Doing the QR decomposition,

$$A = Q \begin{pmatrix} R \\ 0 \end{pmatrix}, \quad Q^T b = \begin{pmatrix} c \\ r \end{pmatrix}, \quad \Rightarrow a = R^{-1}c$$

$$G = \begin{pmatrix} 21 & 105 & 717 \\ 105 & 717 & 5513 \\ 717 & 5513 & 45167 \end{pmatrix} \quad R = \begin{pmatrix} -4.5826 & -22.9129 & -156.5713 \\ 0 & 13.8744 & 138.7444 \\ 0 & 0 & -37.4438 \end{pmatrix}$$

We calculate the condition number then get $cond_G \approx 18981 \gg cond_R \approx 138$