Homework Assignment for Week 09

1. Section 3.5: The cubic spline with not-a-knot condition gives rise to a linear system $Ax = b$ where A is an $(n+1) \times (n+1)$ matrix and $x = (c_0, c_1, \cdots, c_n)^T$. Eliminating c_0 and c_n results in a new equivalent linear system $\tilde{A}\tilde{x} = \tilde{b}$ where $\tilde{x} = (c_1, \cdots, c_{n-1})^T$ and $\tilde{A}$ can be made symmetric. Carry out the details for the case $h_0 = \cdots = h_n = h$ and show that $\tilde{A}$ is symmetric and positive definite (hence the original A is non-singular).

2. Section 4.1: Problems 19, 24, 26, 28, 29.