Geometric Modeling (CSE 4190.667)

Given a knot sequence 0, 0, 0, 3, 4, 6, 6, 6 for a cubic B-spline curve $x(u) = (u, N_3^3(u)), 0 \leq u \leq 6$,

1. What are the B-spline control points $d_i$ for the cubic curve $x(u)$?

2. Using the de Boor algorithm, evaluate the function value $x(5)$.

3. Using the 2-stage de Boor algorithm, evaluate the first derivative $x'(5)$.

4. Using the 2-stage de Boor algorithm, evaluate the second derivative $x''(5)$.