

CS 3513 - Numerical Analysis

Homework #6 - 2006.10.16

Due Date - 2006.10.27

Solutions

This homework assignment will utilize the *splinecoeff.m* and *splineplot.m* Matlab programs.

First, using the natural spline conditions, and secondly the clamped spline conditions, compute (with the help of the *splinecoeff.m* program) the cubic splines coefficients for the given sets of points below. Plot the graphs of each spline using the *splineplot.m*.

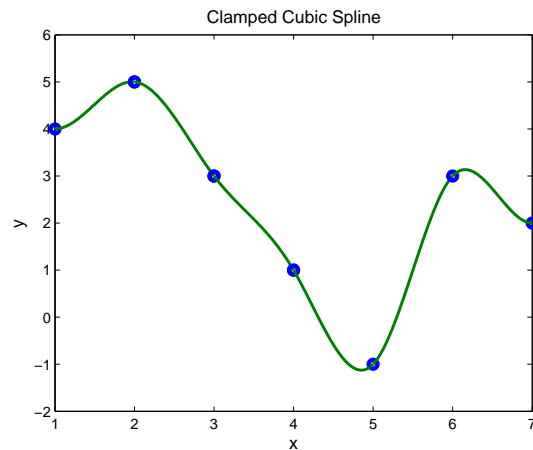
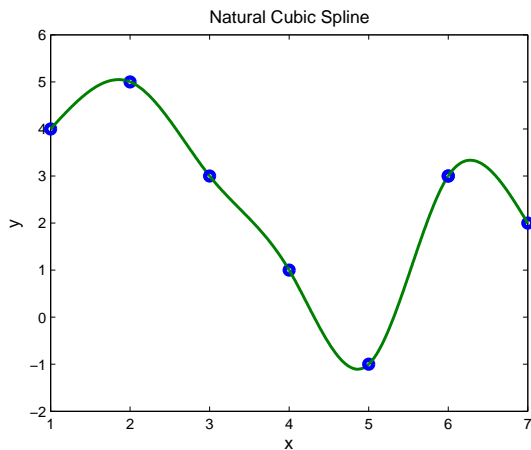
set 1: $\{(1, 4), (2, 5), (3, 3), (4, 1), (5, -1), (6, 3), (7, 2)\}$

Natural Spline Coefficients:

i	b_i	c_i	d_i
1	1.8410	0.0000	-0.8410
2	-0.6821	-2.5231	1.2051
3	-2.1128	1.0923	-0.9795
4	-2.8667	-1.8462	2.7128
5	1.5795	6.2923	-3.8718
6	2.5487	-5.3231	1.7744

Clamped Spline Coefficients:

i	b_i	c_i	d_i
1	0.0000	3.1923	-2.1923
2	-0.1923	-3.3846	1.5769
3	-2.2308	1.3462	-1.1154
4	-2.8846	-2.0000	2.8846
5	1.7692	6.6538	-4.4231
6	1.8077	-6.6154	3.8077



set 2: $\{(-2, 1), (0, 0), (2, 6), (3, 12), (4, -1), (8, 7), (10, 10), (12, 3), (15, 1), (16, -4)\}$

Natural Spline Coefficients:

i	b_i	c_i	d_i
1	-0.6640	0.0000	0.0410
2	-0.1719	0.2460	0.6700
3	8.8518	4.2658	-7.1176
4	-3.9695	-17.0871	8.0566
5	-13.9740	7.0826	-0.7723
6	5.6178	-2.1846	0.0629
7	-2.3663	-1.8074	0.6203
8	-2.1525	1.9144	-0.4730
9	-3.4381	-2.3429	0.7810

Cubic Spline Coefficients:

i	b_i	c_i	d_i
1	0.0000	-0.5771	0.1635
2	-0.3458	0.4042	0.6344
3	8.8833	4.2104	-7.0937
4	-3.9770	-17.0706	8.0476
5	-13.9754	7.0722	-0.7696
6	5.6622	-2.1628	0.0408
7	-2.4988	-1.9177	0.7085
8	-1.6670	2.3336	-0.6667
9	-5.6666	-3.6668	4.3334

