

ME171
Computer-Aided Engineering Design
Spring Term, 2001

Homework #6

Due: May 24, 2001

Expand the program that you wrote for the previous homework set(s) to now read a data file of 3-D control points in the form of x, y, z triplets, one per line, on the range:

$$-1 \leq x \leq 1$$

$$-1 \leq y \leq 1$$

$$-1 \leq z \leq 1$$

and compute:

1. the straight lines through the control points,
2. a periodic cubic ($K = 4$) B-spline.

Your program should produce an output file that can be displayed with the 3-D interactive perspective-view vtk script:

```
display3.vtk
```

(available on the class Web site). Your program should handle at least ten (10) control points.

In addition to the lines and curve (above) your programs should display the edges of a cube 2 units on a side, centered at the origin.

You should turn in one page that shows an example output plot of data from your program, and also turn in a print-out of the C or C++ program source itself.

Please copy your executable (with your username as its name) to the directory

```
/home/cinyoung/ME171/hw6
```

at the ECF. Since we will be testing the executables with our own (different) set of control points, your executable must read its (3-D) input from the file "in3.dat" and must write its (3-D) output to the file "out.dat". These data files should contain space-separated columns of x - y pairs (rather than comma-separated pairs).

Class Web Page: <http://www.design.caltech.edu/Courses/ME171/>

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