

# CAS MA539 – Methods of Scientific Computing

Boston University, Fall 2002

## Homework 3: Interpolation.

(Due October 12)

In class you saw a detailed derivation of two methods of interpolation: Lagrange polynomial interpolation and interpolating cubic splines. For this homework, you are asked to

1. produce a working set of code to calculate each type of interpolating function for a user-specified set of points  $\{(x_1, y_1), \dots, (x_n, y_n)\}$ , and
2. demonstrate that your code works by producing (labeled!) plots of the resulting interpolations for points from two different functions – one “smooth” and the other somewhat less so.

Hence, you should produce two plots, each with three curves plotted upon them – the true function, the spline function, the polynomial function – and the set of points being interpolated.

In writing up this assignment, I am looking for 3 specific components. First, a brief paragraph summarizing what you did (e.g., what language/package you used, whether the code was written in modules or one long program, the functions you chose to use in illustrating your code, etc.). Second, the two plots illustrating that your code works. Third, your code itself, commented to a reasonable degree.