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Math128B: Numerical Analysis

Programming Assignment #1, Due 2/28/2012

Consider the real uni-variate equation

$$f(x) = 0. \tag{1}$$

Develop a matlab program to find a root of $f(x)$ in between two given points that have different signs in their function values. You can use any method in your program, except the matlab built-in function `fzero`.

You should turn in a .m file `fzerouxx.m` which contains a matlab function of the form

```
function [rt,info] = fzerouxx(a,b)
```

where `xxx` is your student id, `rts` is the root and `info` is your output message.

Your program will be stress-tested against a number of test functions of various levels of difficulty and graded according to

1. (30 points) number of correct roots (accurate to at least 3 digits); and
2. (30 points) Accuracy in computed roots (30 points if every root is computed to at least 10 digits.); and
3. (40 points) The number of function evaluations (40 points if every root is found with at most as many function evaluations as `fzero`.)

Your program will receive 0 points if the string `fzero` (in lower case letters) shows up anywhere in your .m file, or if you used `fzero.m` in any form.

Extra Credit: You will receive one extra point of credit for each fewer function evaluation your program requires than `fzero.m`.

Extra Credit: You will receive 100 extra points if your program can find roots with only one initial guess and is as efficient and as reliable as with two initial guesses.

Email your .m file to Darsh by 11:59PM, Feb. 28, 2012.