

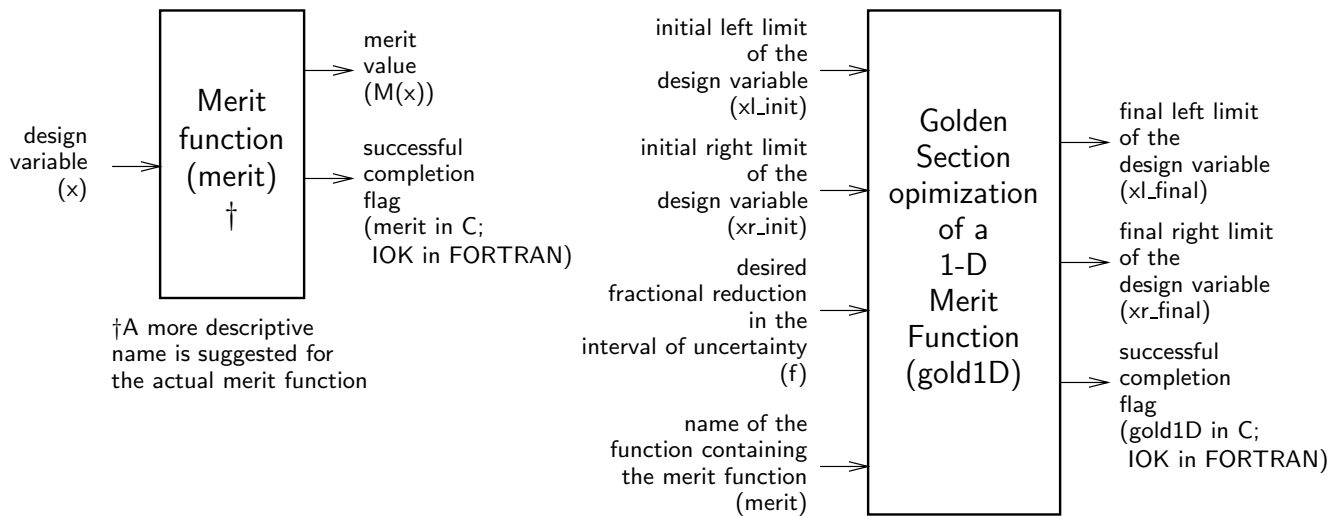
ME 5241, Fall 2000
Computer Aided Engineering

Project #2, Parts 1 & 2 (of 5 parts)

One-Dimensional Golden Section Search

Part 1 (due Monday, 10/9/00; 10 pts)

Write pseudo-code for a function to perform a golden section optimization on any one-dimensional merit function. The optimization function is kept “generic” by isolating the actual merit function in a separate function. Suggested input/output charts for the merit function and one-dimensional golden search function are provided below:



Part 2 (due Friday, 10/13/00; 10 pts)

Implement the golden section routine designed in Part 1 in “C” or FORTRAN. Test the operation of your one-dimensional Golden Section search function by writing a simple mainline and test merit function to find the minimum of the equation:

$$M = (x - 0.2)^2$$

over the initial interval:

$$-2 \leq x \leq 1$$

Use a fractional reduction in the interval of uncertainty of 0.001.

The golden section function should be fully documented¹, but the test mainline and merit function need not be. Please turn in a listing of your test program and a print of a successful run of your test program².

¹Remember, a standard header function is available from file “~tchase/fnchead.c” (or “~tchase/fnchead.f” for FORTRAN users).

²The print can be created using the “script” command as described in Section 6 of the “An Introduction to SGI UNIX Computing” tutorial.