Math 350 — Computer Assignment 1, due Jan. 27, 2011

1. Modify the programs `Skydive.m` and `SkydiveDemo.m` to simulate the solution of Problem #3 from HW Assignment 1 with the specific values of $g = 9.81$, $m = 68.1$, $c_1 = 10$, $c_2 = 50$, $T = 10$, and `tend` $= 20$.

2. Do Exercise 1.33 in NCM.

3. Do Exercise 1.34 in NCM.

4. Do Exercise 1.35 in NCM.

5. Repeat the loss of significant digit experiments for evaluation of the expression $f(x) = x - \sin x$ for small values of x. Also provide a theoretical fix for the problem and implement it.

6. Calculate

   - $29513736 \cdot 92842033$,
   - $0.05 - 0.07 + 0.02 + 0$

   in Excel and MATLAB. Make sure to format your Excel cells to scientific format with 20 digits, and use `format long` to see enough digits in MATLAB.

   Also use Mathematica or Maple with both exact and floating point arithmetic, i.e., `N` in Mathematica or `evalf` in Maple. For the floating point arithmetic you may use both the default precision and "simulated double precision".

   Compare your answers, investigate, and explain.

   This problem is motivated by http://www.spiegel.de/netzwelt/web/0,1518,563637,00.html (if you can read German ☺).