2.003/1053J. Test case for PSET 4.

Version 1 as of October, 7 2005

A little advice to get you started on the right track.

- If you don't feel that you're 100% comfortable with the matlab ODE solver, review the scripts we did in class for lecture 4. You can find them at

  `http://web.mit.edu/2.003/www/matlab_files.html`

- If you feel you're stuck on some part of the problem, please come to office hours, or send me an email. Remember: I won't be able to give office hours on Thursday (Oct 13th), but you're welcome to come to my office w/o appointment on Friday October 14th from 12:30pm to 3:15pm

- The equation you need to solve for are a system of two equations in θ_1 and θ_2. Using the state-space technique seen in class, you can write those equation as a 4-by-4 system, where your state $\mathbf{x}$ is made of $\theta_1, \dot{\theta}_1, \theta_2, \dot{\theta}_2$. You will get an equation of the type $\mathbf{M}(\mathbf{x})\dot{\mathbf{x}} = f(t, \mathbf{x})$. $\mathbf{M}$ is a matrix that only depends on the state (you can divide all the appropriate equations by a constant such as ml^2 so that this is the case).

- Notice that I didn't define the mass m, nor the length l in the `traj.m` script. This is normal, because you problem only depends on the ratio $\frac{g}{l}$, with is defined as the global variable `g_L`.

Testing instructions I created a file `traj.mat` that contains my trajectories (time vector `t`, and state vector `x`). Your trajectories should hopefully be similar (if you started from the same initial conditions as the ones I mentioned in the `traj.m` script . I also wrote a little script `traj_anim.m` that will display your trajectories in one window, and display the actual moving pendulum in another window. Try it using my solution:

```
>> load traj
>> traj_anim
```

...and compare it to what you get using your solution:

```
>> traj
>> traj_anim
```