Notes on MHW1, Summer A 2006

I graded Ch 1.1a, Ch 1.7 and Ch 2.5, for 30 points each, and then added 10 points for overall completeness, neatness, etc. I gave about 1/2 credit for a problem if you entered the right MATLAB commands and another 1/2 credit if you got the point of the problem and answered the verbal parts correctly. I recorded the scores at the top of page one; something like this: "check, 1/2, 3/4+" the check means you got 30/30 on problem 1.1a and so on. The "3/4+" means a little more than 75% credit on problem 2.5. After I decided the problem was worth 30 points, that became 25/30. Most people got about 75 or 80 total points out of 100.

1.1a: Almost everybody got this one. You should print out A1, etc and notice that A1=A4 and A2=A3. Then to be 100% sure, have MATLAB compute A1-A4 and A2-A3. I did not insist that you explain why this happened, but it's a good idea to do that.

1.7: This is a very nice problem that shows how a matrix A can represent the annual changes in a situation, such as the number of married women in a town. We will see this again soon in one of the main examples of the semester - I call it the "Baby Example".

For this problem, be sure to type "format long", or MATLAB will round off the numbers, and you lose the effect. By the end you should notice that A^k is approximately [.4 .4, .6 .6] and that the number of married (resp single) women is approximately 4000 (resp 6000). Notice that this answer would be the same even if, for example, the town had started with only 1000 married women out 10,000.

2.5: The typical result here was that det(U) was exactly right, that det(U') was pretty close (it was a very small number, like det(U) was), and that det(UU') was huge (if you got "e+10" in your answer it means: multiply by 10^{10}). So, I wanted you to point (mainly) to the last of the three numbers.

"Results may vary" if you use some other software (though I got approx the same result with Scilab]. Or, if you have very strange luck with "rand" - but I don't think that happened.