

Matlab Homework 2

MATH461 Spring 2015

Due April 30

This is a written assignment like all the other ones. The only difference is that in each problem you will have to use Matlab. You will print out your log in Matlab and attach it to your work that you submit. See the previous assignment on details how to do this.

The Matlab commands suggested below and on the previous Matlab assignment are enough to solve all the problems. You may use other commands but please explain what they do to make your solution more clear.

Problem 1. *Generate a random 4×6 matrix A and random 6×4 matrix B , both with integer values between -5 and 5. Compute $\det(AB)$ and $\det(B^T A^T)$. What do you observe? What is the reason behind your observation? You may refer to any theorem we discussed in class about matrices and determinants.*

Problem 2. *Textbook problem 37 in section 4.2*

Problem 3. *Textbook problem 17 in section 4.3*

Problem 4. *Textbook problem 33 in section 4.4*

Problem 5. *Textbook problem 36 in section 4.4*

The following Matlab command returns a vector v containing the (complex) eigenvalues of a matrix A :

```
>> v = eig(A)
```

If you want to diagonalize a matrix A use the following command to obtain the diagonal matrix D and the 'eigenbasis matrix' P :

```
>> [P,D] = eig(A)
```

Problem 6. *Generate a random 5×5 matrix A with integer values between 0 and 10. Check that the eigenvalues of both A and A^T are the same.*

Problem 7. *Textbook problem 34 in section 5.3*

Problem 8. *Textbook problem 30 in section 5.4*