CS 132 – Geometric Algorithms

Homework 4

Due: 11:59pm, Friday, June 9, 2017

All problems from [LAA] 5th Edition.

Section 1.8.

1. Problem 10, Page 69.
2. Problem 12, page 69.
3. Problem 14, page 69.
4. Problem 16, page 69.
5. Problem 18, page 69.
6. Problem 20, page 69.

Section 1.9

7. Problem 2, page 79.
8. Problem 4, page 79.
9. Problem 6, page 79.
10. Problem 14, page 79.
11. Problem 18, page 79
12. Problem 20, page 79.
13. Problem 22, page 79.

Section 1.10. Computational.

14. Problem 10, page 88.
15. Problem 12, page 88.

    You will first want to read the discussion on pages 85 and 86 of Lay. Then, for each problem, set up the appropriate matrix-vector computation. Write each one out before you start coding. Show your work.

    Next, solve each problem in Python using either the `AxIP()` or `AxVS()` function that you wrote for Homework 4. Submit a transcript of your code execution, showing the inputs and outputs, and the computation you performed.

    Finally, explain what the outputs from your computation mean.

Continued on next page...

Section 2.1.

16. Problems 16, 18, 20, 22, 24, 26, 28, page 103.

Computational. Solve these problems using `Python/numpy`. One goal of these problems is to make you more familiar with using the `numpy` documentation. It is available at `http://docs.scipy.org/doc/numpy/reference/index.html`. Parts of the documentation you will want to read include array creation routines, random number generation routines, and mathematical functions (for rounding).

To generate random matrices, you will want to use the `numpy.random` package. (Python has a stand-alone `random` library as well, but it will be easier for you if you use routines in `numpy.random`).

17. Problem 35, page 104.

18. Problem 36, page 104.

19. Problem 37, page 104.