Math16B – Week 2 Homework

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Learning Goals

The following are the learning goals for this week. These are a good benchmark for testing your understanding, and these goals will be used to create the evaulations in this course.

Please submit your code as a .py file using the template on LATTE.

Coding Skills

- Break up a large problem into smaller problems
- Define functions that work without errors
- Work with for loops to do linear algebra computations

Linear Algebra

- Recall formulas for sums, dot products, and norms of vectors

Problems

(1) (1 points) Write code to check if a vector in $\mathbb{R}^2$ is in the first quadrant (ie, all of its entries are bigger than or equal to 0).

(2) (3 points) Write code to compute the dot product of two vectors. Your code should be a function whose input is two vectors *whose length you do not necessarily know.* The output should be their dot product in $\mathbb{R}^n$.

(3) (2 points) Write code to compute the norm of a vector. Your code may use any previously defined function.

(4) (4 points) Write code to find the vector with largest norm in a list of vectors. Your code should be a function whose input is a list of vectors, and whose output is the vector with the largest Euclidean norm. In case of a tie, return the *first* vector in the list.