

Name: _____
Due: 06/13

ESMI Applied Math
Worksheet 5

Problem 1. Compute the matrix-matrix product: $\begin{bmatrix} 1 & 2 \\ 3 & 4 \\ -1 & 0 \end{bmatrix} \cdot \begin{bmatrix} 1 & 2 & 7 & -3 \\ 3 & 4 & -2 & 0 \end{bmatrix}$.

Problem 2. Compute the eigenvalues and eigenvectors of $\begin{bmatrix} -5 & 2 \\ 2 & -2 \end{bmatrix}$.

Problem 3. Write code that first stores matrices A and B into python variables then computes the element-wise product between the two matrices. Your answer should use loops.

$$A = \begin{bmatrix} 1 & -2 & 0 \\ 2 & 3 & -5 \end{bmatrix}, B = \begin{bmatrix} 0 & -3 & 4 \\ 1 & 2 & 3 \end{bmatrix}$$

hint: the result should be $C = \begin{bmatrix} 1 \cdot 0 & -2 \cdot -3 & 0 \cdot 4 \\ 2 \cdot 3 & 3 \cdot 2 & -5 \cdot 3 \end{bmatrix}$

Problem 4. Write a python function that takes in two numpy arrays (matrices) as inputs and returns the matrix-matrix product if possible. If the matrix-matrix product is not possible, your function should print "these matrices are not compatible for matrix-matrix multiplication". Code this up first in jupyter notebooks and once you are happy with your answer, please write your function below.

Problem 5. Think of a way to store all of the information in the following graph into variables in python then do it! Write code in jupyter notebooks first then write your code below. Note: there are many right answers.

