Lab Objectives:
To input two vectors, perform elementary operations, and output the results.

Description of Lab:
Your program will ask the user to enter two vectors, \( \vec{x} \) and \( \vec{y} \). It will then perform the following operations: magnitude of each, dot product, cross product, projection.

Requirements: The program should...
1. Ask the user to enter two vectors with the same dimension, and return an error if not entered correctly, or if the dimensions of the vectors are not the same.
2. Determine and output the magnitude of \( \vec{x} \) and \( \vec{y} \)
3. Determine and output the dot product, \( \vec{x} \cdot \vec{y} \)
4. Determine and output the angle between \( \vec{x} \) and \( \vec{y} \), in degrees (Note that there are limitations of vector dimension here, and your code should output an error if the dimensions are not correct).
5. Determine and output the cross product, \( \vec{x} \times \vec{y} \) (Note that there are limitations of vector dimension here, and your code should output an error if the dimensions are not correct).
6. Determine and output the projections \( \text{proj}_x \vec{y} \) and \( \text{proj}_y \vec{x} \)

What to Turn In:
1. A printout of your original code
2. A printout of the results for the following sample data inputs:
   a. \( \vec{x} = \langle 1,1,1 \rangle \) and \( \vec{y} = \langle -1,1,-1 \rangle \)
   b. \( \vec{x} = \langle 3,2,1 \rangle \) and \( \vec{y} = \langle -1,-2,4 \rangle \)
   c. \( \vec{x} = \langle 0,1 \rangle \) and \( \vec{y} = \langle -1,0 \rangle \)
   d. \( \vec{x} = \langle 1,1,1 \rangle \) and \( \vec{y} = \langle -1,1 \rangle \)
   e. \( \vec{x} = \langle 1,1,1,1 \rangle \) and \( \vec{y} = \langle -1,1,-1,-1 \rangle \)
3. Please be sure to label your pages at the top (i.e. “Original Code page 1 of 2” and “Run page 1 of 1”, etc).
4. Include a cover sheet, with “Programming Assignment 5”, your name, and date.