Quiz 2 (linear algebra, numpy, week2)

Due Apr 9 at 11:59pm **Allowed Attempts** 2

Points 5

Questions 10

Time Limit None

Take the Quiz Again

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	16 minutes	4.5 out of 5

(!) Answers will be shown after your last attempt

Score for this attempt: 4.5 out of 5

Submitted Apr 9 at 7:54am

This attempt took 16 minutes.

Question 1

0.5 / 0.5 pts

Geometrically, what does 2x2 matrix $A = \begin{pmatrix} 2 & 0 \\ 0 & 1 \end{pmatrix}$ do to a vector

 $\mathbf{v} = \left(egin{array}{c} x \ y \end{array}
ight)$ in $A\mathbf{v}$? You can try with a few vectors to get the idea.

- odouble x, maintain y
- odouble y, maintain x
- orotate the vector clockwise by 90 degrees
- orotate the vector counterclockwise by 90 degrees
- odouble x, double y



Question 2 0 / 0.5 pts

Based on the above geometric observation, which of the following vectors are eigenvectors of matrix A? Recall that a vector \mathbf{v} is said to be an eigenvector of A if there is a scalar λ such that $A\mathbf{v}=\lambda\mathbf{v}$; geometrically, it basically says $A\mathbf{v}$ only "stretches" \mathbf{v} by λ fold but does not rotate \mathbf{v} . Consider all vectors in the answers column vectors (Canvas does not allow LaTeX in the answers).

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(0,	1)
\ '	,

$$(-2, 0)$$

(1, 2)

Question 3

0.5 / 0.5 pts

lf

x = np.arange(3)

y = range(3)

Is x+x same as y+y?

Yes, exactly the same



Almost the same, but of different types (x+x returns a numpy array but y+y returns Python list)

Different: x+x is concatenation, and y+y is element-wise addition

Different: x+x is element-wise addition, and y+y is concatenation

Question 4

O.5 / 0.5 pts

If x = np.array([1,2,3]), how do you concatenate x and x to np.array([1,2,3,1,2,3])?

□ np.concatenate([x, x], axis=0)

□ x * 2

□ x + x

□ np.concatenate([x, x], axis=1)

□ np.concatenate([x, x], axis=1)

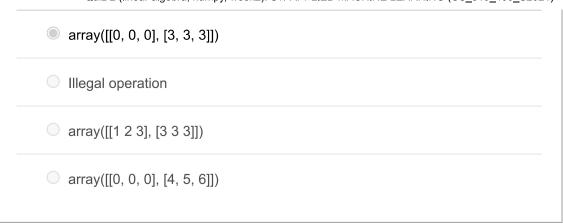
Question 5 0.5 / 0.5 pts

If x = np.array([[1,2,3], [4,5,6]]),

and y = np.array([1,2,3]).

Then x - y = ?





 Question 6
 0.5 / 0.5 pts

 If x = np.array([[3,4], [5,12]])

 What is the result of np.linalg.norm(x)?

 □ 16.0

 □ array([7., 17.])

 □ array([5., 13.])

 □ 13.92838827718412

Question 7 0.5 / 0.5 ptsIf x = np.array([[3,4], [5,12]])What is the result of np.linalg.norm(x,axis=1)?



Hint: please refer to the topic "Euclidean vs. Manhattan Distances" in week one's slide.

array([5., 13.])

13.92838827718412

array([7., 17.])

 Question 8
 0.5 / 0.5 pts

 If x = np.array([[3,4], [5,12]])

 What is the result of np.linalg.norm(x,axis=1,ord=1)?

 array([4., 12.])

 array([5., 13.])

 array([7., 17.])

 13.92838827718412

Question 9 0.5 / 0.5 pts

If x = np.array([3,4,1,5,12])What is the result of x[x>=4]?



Hint: conditional slicing
array([False, True, False, True, True])
array([4, 5, 12])
O True
Illegal operation

Question 10	0.5 / 0.5 pts	
If A = np.array([[1, 2],		
[3, 4]]),		
and v = np.array([2, -1]).		
Then what are the results of A.dot(v) and A * v ?		
2 and array([0, 2])		
array([0, 2]) and array([[2, -2], [6, -4]])		
○ illegal operation: A * v		

Quiz Score: 4.5 out of 5