Unit 4 - Week 1

Assignment 1

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-08-14, 23:59 IST.

A (RGB colour) 256x256 image is input into an algorithm which outputs a (colour) 32x32 image representing some important portions of the original image. For example, the input could be the image of a lung and the output could be a suspicious tumor like portion, etc. (We encourage you to think of other examples, as an exercise).
Based on above data answer the questions 1 to 3

1) If the input is turned into a vector **x**, its length would be?

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 196608

1 point

2) If the output is turned into a vector **y**, its length would be?

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 3072

1 point

3) If we write a model of the relation between the input vector x and output vector y as y = Ax + b. Then, the total number of elements in the matrix A is?

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 603979776

1 point

4) Let $x = \begin{bmatrix} -2 & -3 & 4 & -8 & 9 \end{bmatrix}^T$. Then, which of these is the greatest? *1 point*

- The L_1 norm
- The L_2 norm
- The L_3 norm
- The L_∞ norm

No, the answer is incorrect.
Score: 0
Accepted Answers:
The L_1 norm

Note : Some of the following questions might require you to write short programs in order to answer (or else it would require doing extremely long computations by hand). We recommend using MATLAB for simplicity, but any programming environment will do.

Consider the following matrix $W = \begin{bmatrix} 8 & 5 & 1 & 5 & 6 \\ 5 & 3 & 8 & 7 & 5 \\ 1 & 8 & 10 & 7 & 8 \\ 5 & 7 & 7 & 8 & 9 \\ 6 & 5 & 8 & 9 & 7 \end{bmatrix}$ .Answer all the following questions 5 to 7 (to 4 decimal places with rounding off)

5) What is the maximum eigenvalue of W?

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 32.27,32.28

1 point

6) What is the square root of the maximum eigenvalue of W^2?

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 32.27,32.28

1 point

7) What is the maximum singular value of W?

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 32.27,32.28

1 point

8) Which of the following is true? Choose all the correct answers *1 point*

- $|\lambda(M)| = \sqrt{(\lambda(M^2))} = svd(M)$ for every matrix M
- $|\lambda(M)| = \sqrt{(\lambda(M^2))} = svd(M)$ for every real matrix M
- $|\lambda(M)| = \sqrt{(\lambda(M^2))} = svd(M)$ for every real, symmetric matrix M
- $\sqrt{(\lambda(M^2))}$ is always real for every real, symmetric matrix M

No, the answer is incorrect.
Score: 0
Accepted Answers:
$|\lambda(M)| = \sqrt{(\lambda(M^2))} = svd(M)$ for every real, symmetric matrix M
$\sqrt{(\lambda(M^2))}$ is always real for every real, symmetric matrix M

Let $y_0 = \begin{bmatrix} 0 & 1 & 0 & 0 & 0 \end{bmatrix}^T$ and $b = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \end{bmatrix}^T$

Let there be an iterative rule such that $y_1 = Wy_0 + b$ and, in general, $y_n = Wy_{(n-1)} + b$

Then answer the following questions ,rounding off the answers upto 4 decimals

9) Value of $||y_1||_2 = ?$

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 13.52,13.53

1 point

10)Value of $||y_2||_2 / ||y_0||_2 = ?$

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 422.29,422.30

1 point