Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

4.25 to 4.45

Question Number : 139 Question Id : 640653588653 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0.5

Question Label : Short Answer Question

What is the p-value for the regression model?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.05 to 0.06

MLF

Section Id :	64065339801
Section Number :	8
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	11
Number of Questions to be attempted :	11
Section Marks :	40
Display Number Panel :	Yes
Group All Questions :	No

Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065384969
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 140 Question Id : 640653588654 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : MACHINE LEARNING FOUNDATIONS (COMPUTER BASED EXAM) "

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

Options :

6406531963378. ✔ YES

6406531963379. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	64065384970
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 141 Question Id : 640653588655 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which among the following is/are true for a Hermitian matrix?

Options :

6406531963380. ✔ The eigenvalues of a Hermitian matrix are always real.

6406531963381. ✔ The diagonal elements of a Hermitian matrix are always real.

6406531963382. ✖ All symmetric matrices are Hermitian.

6406531963383. ✖ All Hermitian matrices are symmetric.

Question Number : 142 Question Id : 640653588657 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following options are true?

Options :

6406531963385. ✖ A matrix that is both unitary and Hermitian must be a diagonal matrix.

6406531963386. ✔ A matrix that is both unitary and Hermitian need not be a diagonal matrix.

6406531963387. ✔ If matrix A is unitary, then A^* is unitary.

6406531963388. ✖ If matrix A is unitary then, A^* may not be unitary.

Question Number : 143 Question Id : 640653588660 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which among the following statements is/are true?

Options :

6406531963397. ✔ If a function is positive semidefinite, then it only has a global minimum.

6406531963398. ✖ If a function is positive semidefinite, then it has both global minimum and global maximum.

6406531963399. ✔ If a function is negative semidefinite, then it only has a global maximum.

6406531963400. ✖ If a function is negative semidefinite, then it has both global minimum and global maximum.

Sub-Section Number :	3
Sub-Section Id :	64065384971
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 144 Question Id : 640653588656 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

Consider a 2×2 matrix $A = \frac{1}{k}\begin{bmatrix} 2 & -2+i \\ i+2 & 2 \end{bmatrix}$. Find the value of k such that A is a unitary matrix.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 145 Question Id : 640653588668 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

If $f([1,2,3]^T) = 10$ and $\nabla f([1,2,3]^T) = [1,5,7]^T$, then find the value of $f([2,2,2]^T)$ using first order taylor series expansion.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Sub-Section Number :	4
Sub-Section Id :	64065384972
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 146 Question Id : 640653588658 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Which among the following functions are positive definite?

Options :

6406531963389. ✖ $Q(x,y) = xy$

6406531963390. ✔ $Q(x,y) = x^2 - xy + y^2$

6406531963391. ✖ $Q(x,y) = x^2 - 2xy + y^2$

6406531963392. ✖ $Q(x, y) = x^2 + xy$

Sub-Section Number : 5

Sub-Section Id : 64065384973

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 147 Question Id : 640653588659 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Given the following information about a 4×2 matrix A:

- The characteristic polynomial of A^TA is $(\lambda - 48)(\lambda - 12)$.
- Eigenvectors of A^TA corresponding to eigenvalues $\lambda = 48$, $\lambda = 12$ are $q_1 = \begin{pmatrix} 1/\sqrt{2} \\ 1/\sqrt{2} \end{pmatrix}$ and $q_2 = \begin{pmatrix} 1/\sqrt{2} \\ -1/\sqrt{2} \end{pmatrix}$, respectively.
- $Aq_1 = \begin{pmatrix} 4/\sqrt{2} \\ -8/\sqrt{2} \\ 0 \\ 4/\sqrt{2} \end{pmatrix}$, $Aq_2 = \begin{pmatrix} -2/\sqrt{2} \\ 0 \\ 4/\sqrt{2} \\ 2/\sqrt{2} \end{pmatrix}$

What is the matrix A?

Options :

6406531963393. ✖ $\begin{bmatrix} 1 & 3 \\ 0 & 0 \\ 2 & -2 \\ 1 & -1 \end{bmatrix}$

6406531963394. ✖

$$\begin{bmatrix} 2 & 2 \\ -4 & -4 \\ 0 & 0 \\ 2 & 2 \end{bmatrix}$$

6406531963395. ✖ $$\begin{bmatrix} -1 & 1 \\ 0 & 0 \\ 2 & -2 \\ 1 & -1 \end{bmatrix}$$

6406531963396. ✔ $$\begin{bmatrix} 1 & 3 \\ -4 & -4 \\ 2 & -2 \\ 3 & 1 \end{bmatrix}$$

Sub-Section Number : 6

Sub-Section Id : 64065384974

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 148 Question Id : 640653588661 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Short Answer Question

Suppose you have a 3-dimensional dataset $\{x_1, x_2, \ldots x_n\}$ with mean zero.

Suppose the covariance matrix $C = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$. For projection using PCA onto a line, what is the projected variance?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 149 Question Id : 640653588667 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Short Answer Question

What is the maximum area of a circle that can be inscribed in a closed region formed by two parabolas, $y = 2 - x^2$ and $y = x^2 - 2$?
Hint: The circle will be centered at origin.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5.3 to 5.7

Sub-Section Number :	7
Sub-Section Id :	64065384975
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653588662 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (150 to 153)

Question Label : Comprehension

Anwer the given subquestions.

Sub questions

Question Number : 150 Question Id : 640653588663 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the dataset
$\mathcal{D} = \{(-1, 1), (0, 1), (1, 1)\}$.
What is the first principal component (i.e., the direction corresponding to the largest eigenvalue of the covariance matrix) for the given dataset?

Options :

6406531963402. ✔ $\begin{pmatrix} 1 \\ 0 \end{pmatrix}$

6406531963403. ✖ $\begin{pmatrix} 0 \\ 1 \end{pmatrix}$

6406531963404. ✖ $\begin{pmatrix} 1 \\ 1 \end{pmatrix}$

6406531963405. ✖ $\begin{pmatrix} -1 \\ 0 \end{pmatrix}$

Question Number : 151 Question Id : 640653588664 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

If you change the dataset to $\mathcal{D}' = \{(-1,1),(0,0),(1,1)\}$, what will be the first principal component?

Options :

6406531963406. ✔ $\begin{pmatrix}1\\0\end{pmatrix}$

6406531963407. ✖ $\begin{pmatrix}0\\1\end{pmatrix}$

6406531963408. ✖ $\begin{pmatrix}1\\1\end{pmatrix}$

6406531963409. ✖ $\begin{pmatrix}-1\\0\end{pmatrix}$

Question Number : 152 Question Id : 640653588665 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

For the dataset $\mathcal{D}'$, let $\tilde{x_1}, \tilde{x_2}$ and $\tilde{x_3}$ be the projection of data points on the first principal component, then which among the following is true?

Options :

6406531963410. ✖ $\tilde{x_1} = \begin{pmatrix}-1\\2/3\end{pmatrix}, \tilde{x_2} = \begin{pmatrix}1\\2/3\end{pmatrix}, \tilde{x_3} = \begin{pmatrix}1/2\\2/3\end{pmatrix}$

6406531963411. ✔ $\tilde{x_1} = \begin{pmatrix} -1 \\ 2/3 \end{pmatrix}, \tilde{x_2} = \begin{pmatrix} 0 \\ 2/3 \end{pmatrix}, \tilde{x_3} = \begin{pmatrix} 1 \\ 2/3 \end{pmatrix}$

6406531963412. ✖ $\tilde{x_1} = \begin{pmatrix} 1 \\ 2/3 \end{pmatrix}, \tilde{x_2} = \begin{pmatrix} 0 \\ 2/3 \end{pmatrix}, \tilde{x_3} = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$

6406531963413. ✖ $\tilde{x_1} = \begin{pmatrix} 1 \\ 2/3 \end{pmatrix}, \tilde{x_2} = \begin{pmatrix} 1 \\ 2/3 \end{pmatrix}, \tilde{x_3} = \begin{pmatrix} -1 \\ 2/3 \end{pmatrix}$

Question Number : 153 Question Id : 640653588666 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

What is the reconstruction error after projecting $\mathcal{D}'$ along the first principal component?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.20 to 0.24

BDM

Section Id : 64065339802

Section Number : 9