Published Preview Edit

Quiz 6

This is a preview of the draft version of the quiz

Quiz Type	Graded Quiz
Points	5
Assignment Group	Assignments
Shuffle Answers	No
Time Limit	No Time Limit
Multiple Attempts	Yes
Score to Keep	Highest
Attempts	2
View Responses	Always
Show Correct Answers	After Last Attempt
One Question at a Time	No
Require Respondus LockDown Browser	No
Required to View Quiz Results	No
Webcam Required	No

Due	For	Available from	Until
Oct 25	Everyone	Oct 22 at 10pm	Dec 31 at 11:59pm

Preview

Score for this attempt: **0** out of 5
Submitted Oct 27 at 3:20pm
This attempt took less than 1 minute.

Jnanswered

Question 1

0 / 1 pts

Consider $X \in R^d$ to be our instance space, and a kernel $K(x, y) = (x^T y + 1)^2$. Assume that, rather than using this kernel, you will explicitly blow up the feature space to learn the same model as using the kernel. What is the minimal dimensionality of the resulting feature space (including one constant feature)?

- $2^d + 2$
- $d \cdot (d - 1)/2$

orrect Answer

- $(d^2 + 3d + 2)/2$
- $d^2 + 2$

Jnanswered

Question 2

0 / 1 pts

Given a kernel $k(x, y) = (x^T \cdot y + 4)^2$ where $x = [x_1, x_2]$ and $y = [y_1, y_2]$, which of the following shows that it is indeed a valid kernel?

orrect Answer

$k(x, y) =< \phi(x), \phi(y) >$where

$$\phi(x) = \begin{bmatrix} x_1^2 \\ x_2^2 \\ 2\sqrt{2}x_1 \\ 2\sqrt{2}x_2 \\ \sqrt{2}x_1x_2 \\ 4 \end{bmatrix}, \phi(y) = \begin{bmatrix} y_1^2 \\ y_2^2 \\ 2\sqrt{2}y_1 \\ 2\sqrt{2}y_2 \\ \sqrt{2}y_1y_2 \\ 4 \end{bmatrix}$$

- $k(x,y) =< \phi(x), \phi(y) >$ where $\phi(x) = \begin{bmatrix} 4x_1^2 \\ 4x_2^2 \\ \sqrt{2}x_1x_2 \\ 8x_1 \\ 8x_2 \\ 16 \end{bmatrix}, \phi(y) = \begin{bmatrix} 4y_1^2 \\ 4y_2^2 \\ \sqrt{2}y_1y_2 \\ 8y_1 \\ 8y_2 \\ 16 \end{bmatrix}$

- $k(x,y) =< \phi(x), \phi(y) >$ where $\phi(x) = \begin{bmatrix} x_1^2 \\ x_2^2 \\ 4 \end{bmatrix}, \phi(y) = \begin{bmatrix} y_1^2 \\ y_2^2 \\ 4 \end{bmatrix}$

- None of the above.

Jnanswered

Question 3

0 / 1 pts

Let $x, z \in R^n$. Then $K(x,z)$ is a valid kernel if there exists a transformation $\phi : R^n \rightarrow R^m, \phi(x), \phi(z) \in R^m$ such that:

- $K(x,z) = \phi(x)\phi(z)$

orrect Answer

- $K(x,z) = \phi(x)^T\phi(z)$

- $K(x,z) = \phi(x)\phi(z)^T$

- $K(x,z) = \phi(x) + \phi(z)$

Jnanswered

Question 4

0 / 1 pts

If we want to map sample points to a very high-dimensional feature space, the kernel trick can save us from having to compute those features explicitly, saving us a lot of time.

orrect Answer

- True
- False

Jnanswered

Question 5

0 / 1 pts

$K(x, z) = (x^T z)^2$ is not a valid kernel.

- True

orrect Answer

- False

Quiz Score: **0** out of 5