Quiz 2

Read the instructions carefully.

- All questions are compulsory.
- This is a closed book quiz; do not use or look at the lecture slides while answering.
- After you select the answer, click on **Submit** within each question to save your answer, this will popup "answer submitted".
- Donot Click on, the "**Previous/Next**" page at the end of the page. All questions will be displayed on a single page.
- Ensure your camera [**Join Virtual Classroom**] while attempting the quiz; failure to comply will result in a deduction of marks.

1

1.0/1.0 point (graded)
Logistic regression can be used in which of the following applications

- ○ Stock price forecasting
- ○ Predicting the price of a home
- ◉ Prediction of the occurrence of diabetes
- ○ Clustering of users based on shopping information

✔

Submit

2

0.0/1.0 point (graded)
As $z \to 0$, the logistic function approaches the limit

- ○ 0
- ○ ∞
- ◉ 1
- ○ 0.5

✖

Submit

3

1.0/1.0 point (graded)
Consider the logistic function $f(z)$. Its derivative is given as

- ◉ $f(z)(1-f(z))$
- ○ $f^2(z)$
- ○ $(1-f(z))^2$

- [ ] $f(z)^2(1-f(z))^2$

✔

Submit

4

1.0/1.0 point (graded)

In logistic regression, the quantity $P(y=0\,|\,\bar{\mathbf{x}})$ is modeled as

- [ ] $\frac{1}{1+e^{-\bar{\mathbf{x}}^T\bar{\mathbf{h}}}}$
- [x] $\frac{e^{-\bar{\mathbf{x}}^T\bar{\mathbf{h}}}}{1+e^{-\bar{\mathbf{x}}^T\bar{\mathbf{h}}}}$
- [ ] $e^{-(\bar{\mathbf{x}}^T\bar{\mathbf{h}})^2}$
- [ ] $e^{-\bar{\mathbf{x}}^T\bar{\mathbf{h}}}$

✔

Submit

5

1.0/1.0 point (graded)

Consider the data x_i to be distributed as a Gaussian with mean μ and variance σ^2. The standard scaled data is given as

- [ ] x_i
- [ ] $x_i-\mu$
- [x] $\frac{x_i-\mu}{\sigma}$
- [ ] $\frac{x_i-\mu}{\sigma^2}$

✔

Submit

6

1.0/1.0 point (graded)

General structure of a hyperplane is

- [x] $\bar{\mathbf{a}}^T\bar{\mathbf{x}}=b$

- ( ) $\bar{\mathbf{x}}^T\bar{\mathbf{x}} = b$
- ( ) $\bar{\mathbf{x}}^T\bar{\mathbf{x}} \le b$
- ( ) $\bar{\mathbf{a}}^T\bar{\mathbf{x}} \ge b$

✔

Submit

7

1.0/1.0 point (graded)

What is the distance between the two hyperplanes given below

$$x_1 + 2x_2 + 3x_3 + \cdots + Nx_N = 1$$
$$x_1 + 2x_2 + 3x_3 + \cdots + Nx_N = -1$$

- ( ) $\frac{2}{\sqrt{N(N+1)}}$
- ( ) $\frac{2\sqrt{2}}{\sqrt{N(N+1)}}$
- (●) $\frac{2}{\sqrt{\frac{N(N+1)(2N+1)}{6}}}$
- ( ) $\frac{1}{2\sqrt{\frac{N(N+1)(2N+1)}{6}}}$

✔

Submit

8

1.0/1.0 point (graded)

Kernel SVM with sigmoid kernel can be loaded in PYTHON as

- ( ) ksvmc = SVM(kernel = 'sigmoid', random_state = 0)
- ( ) ksvmc = support_vector_machine(sigmoid, random_state = 0)
- ( ) ksvmc = support_vector_classifier(sigmoid, random_state = 0)
- (●) ksvmc = SVC(kernel = 'sigmoid', random_state = 0)

✔

Submit

9

1.0/1.0 point (graded)

The dual problem to determine the support vector classifier is

- ( ) $\min \|\bar{\mathbf{a}}\|_2$
  $\mathcal{C}_0: \bar{\mathbf{a}}^T \bar{\mathbf{x}}_i + b \geq 1,\ 1 \leq i \leq M$
  $\mathcal{C}_1: \bar{\mathbf{a}}^T \bar{\mathbf{x}}_i + b \leq -1,\ M+1 \leq i \leq 2M$

- (•) $\max \sum_{i=1}^{2M} \lambda_i - \frac{1}{2} \sum_{i,j=1}^{2M} \lambda_i \lambda_j y(i) y(j) \bar{\mathbf{x}}^T(i) \bar{\mathbf{x}}(j)$
  subject to $\lambda_i \geq 0$
  $$\sum_{i=1}^{2M} \lambda_i y(i) = 0$$

- ( ) $\min \|\bar{\mathbf{a}}\|_2$
  $\mathcal{C}_0: \bar{\mathbf{a}}^T \bar{\mathbf{x}}_i + b \leq 1,\ 1 \leq i \leq M$
  $\mathcal{C}_1: \bar{\mathbf{a}}^T \bar{\mathbf{x}}_i + b \geq -1,\ M+1 \leq i \leq 2M$

- ( ) $\max \sum_{i=1}^{2M} \lambda_i - \frac{1}{2} \sum_{i,j=1}^{2M} \lambda_i \lambda_j y(i) y(j) \bar{\mathbf{x}}^T(i) \bar{\mathbf{x}}(j)$
  subject to $\lambda_i = 0$
  $$\sum_{i=1}^{2M} \lambda_i y(i) \geq 0$$

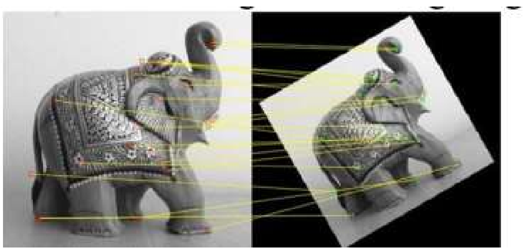
✓

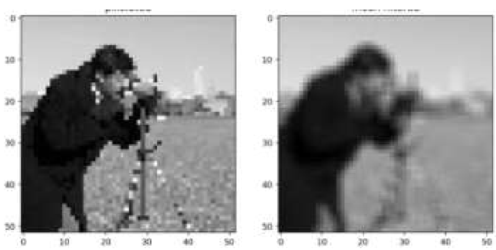
Submit

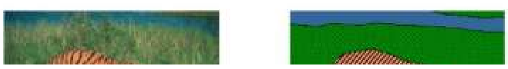
10

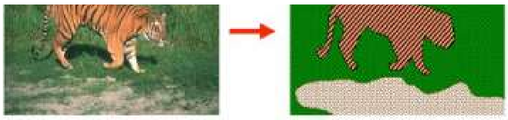
1.0/1.0 point (graded)

Which for the following shows image segmentation

- ( ) 

- ( ) 

- (•) 



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