

Machine Learning (CS1741) (EL VII)

Sessional II

Time: 30 Minutes

Max Marks: 15

Note: Answer all questions. Any missing / misprinted data may be suitably assumed

...

Points: 15/15

1

Hard margin in SVM allows very low error in classification.

(1/1 Points)

☒ True ✓

☐ False

2

A perceptron with 4 inputs has the weight vector W . The activation function is linear and given by $f(yin) = 2yin$. If the input vector is X , then find the output of the neuron given the followings.

(2/2 Points)

$W = [1 \ 2 \ 3 \ 4]^T$ and $X = [5 \ 6 \ 7 \ 8]^T$

☐ 70

- ☐ 128
- ☒ 140 ✓
- ☐ 64

3

Suppose you are applying 5x5 convolutional mask on 32x32 input image (neurons) from MNIST data set. Compute the size of the first convolved layer/hidden on valid convolution without zero padding. The size of the stride is given as 1.
(2/2 Points)

- ☐ 30 × 30
- ☒ 28 × 28 ✓
- ☐ 32 × 32
- ☐ 26 × 26

4

If the training examples are linearly separable, how many decision boundaries can separate positive from negative data points in Support Vector Machines (SVM)?
(1/1 Points)

- ☐ One
- ☐ Two
- ☒ Infinite ✓
- ☐ None of these

5

Consider a following model for logistic regression: $P(y = 1|x, w) = g(w_0 + w_1x)$ where $g(z)$ is the logistic function. What would be the value of P ?
(1/1 Points)

- ☐ $(0, \infty)$
- ☐ $(-\infty, 0)$
- ☒ $(0, 1)$ ✓
- ☐ $(-\infty, \infty)$

6

If you are using all features of my dataset and you achieve 100% accuracy on my training set using a Multi-layer Neural Network model, but ~70% on validation set, what should you look out for?
(1/1 Points)

- ☐ Underfitting
- ☐ Nothing, the model is perfect
- ☒ Overfitting ✓
- ☐ None of the above

7

Logistic Regression transforms the output probability to be in a range of $[0, 1]$. Which of the following function is used by logistic regression to convert the probability in the range between $[0, 1]$.
(1/1 Points)

- ☒ Sigmoid ✓

- ☐ Mode
- ☐ Square
- ☐ All of the above

8

The effectiveness of an SVM depends upon:
(1/1 Points)

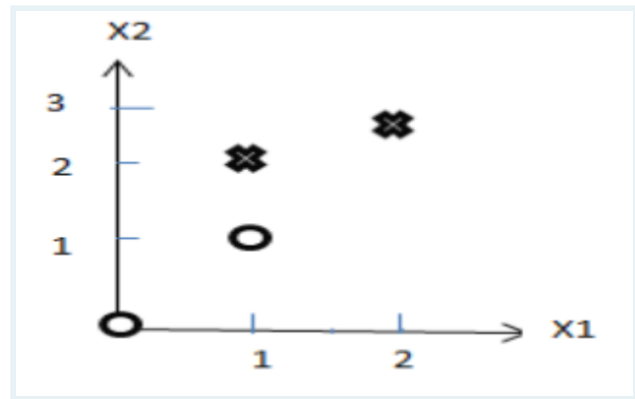
- ☐ Selection of Kernel
- ☐ Kernel Parameters
- ☐ Soft Margin Parameter C
- ☒ All of the above ✓

9

How can you prevent a clustering algorithm from getting stuck in bad local optima?
(1/1 Points)

- ☐ Set the same seed value for each run
- ☒ Use multiple random initializations ✓
- ☐ Both A and B
- ☐ None of the above

10



Consider the following two-class data set as shown in Figure. Just by visual inspection, find the decision boundary learnt by SVM. [X- Class 1 and O- Class 0].

(2/2 Points)

- ☐ $X_1 = 1.5$
- ☒ $X_2 = 1.5$ ✓
- ☐ $X_1 + X_2 = 1.5$
- ☐ None of these

11

A feed-forward neural network is said to be fully connected when

(1/1 Points)

- ☐ All nodes are connected to each other.
- ☐ All nodes at the same layer are connected to each other.
- ☒ All nodes at one layer are connected to all nodes in the next higher layer. ✓
- ☐ All hidden layer nodes are connected to all output layer nodes.

12

Suppose, you applied a Logistic Regression model on a given data and got a training accuracy X and testing accuracy Y. Now, you want to add a few new features in the same data. Select the option(s) which is correct in such a case. (1/1 Points)

- ☐ Training accuracy increases
- ☐ Testing accuracy increases or remains the same
- ☒ Both (A) and (B) ✓
- ☐ None of these

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