

# Assignment 5

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## Submitted assignment

Due on 2015-09-01, 23:55 IST

- 1) How many McCulloch Pitts neurons do we need to implement XOR, if we can connect them in layers?

1 point
- ☐ 4

☐ 3

☒ 5

☐ 6

2) Two layer perceptron networks can represent any Boolean function? True or False?

1 point

☒ True

☐ False

3) The chief difficulty in training deep networks is the \_\_\_\_\_ gradient problem.

1 point

Vanishing

4) For pre-training phase in the layer-wise training of deep networks, we use the input itself as the target output. True or False?

1 point

☒ True

☐ False

5) Back-propagation training will always find a separating hyperplane if it exists. True or False?

1 point

☐ True

☒ False

6) I wish to add a parameter that will allow me to change the slope of the sigmoid, i.e., the rate at which it goes from 0 to 1. Which of the following achieves that? **1 point**

a)  $\frac{1}{1+e^{-\beta v}}$

b)  $\frac{\beta}{1+e^{-v}}$

c)  $\frac{1}{1+\frac{e^{-v}}{\beta}}$

d)  $\frac{1}{\beta+e^{-v}}$

☒ a

☐ b

☐ c

☐ d

7) **1 point**

Questions 7 to 9 pertains to the following description.

7) Given 10 transactions from a Super Market, Answer the following questions after performing Association rule mining with the Threshold frequency of 5.

Customer ID	Items
1	Bread, Milk, Lays chips, Mango, Jam.
2	Milk, Lays Chips, Mango, 5-star, Sugar.
3	Bread, Milk, Lays Chips, Mango, Apple, Banana, Salt.
4	Bread, Milk, Lays chips.
5	Bread, Milk, Apple.
6	Bread, Milk, Lays chips, Apple, Sugar.
7	Bread, Milk, Lays chips, Salt, Sugar.
8	Mango, Apple, Banana.
9	Bread, Milk, Lays Chips, Jam, Sugar.
10	Milk, Lays Chips.

What is the support for the rule “Milk-Lays Chips”?

☐ 90%

- ☐ 70%
- ☒ 80%
- ☐ 100%

8) What is the Confidence for the rule “Milk – Lays Chips“?

**1 point**

- ☐ 66.67%
- ☐ 100%
- ☐ 72.5%
- ☒ 88.88%

9) How many number of Frequent 3 Itemsets are present?

**1 point**

- ☐ 3
- ☐ 0
- ☒ 1
- ☐ 2

10) Question 10 and 11 pertains to the following experiment

**1 point**

This was an experiment conducted at a major multinational company that sells computers. This company was known to be a trailblazer in the made-to-assemble (build-to-order) way of selling computers. In this instance, they are doing a designed experiment to assess the effect of setting different defaults for the configuration of a given model in their online purchase site. Specifically, The effect of setting the processor default at 1.5 Ghz versus 1.7 Ghz (variable A), and the effect of setting HDD capacity default at 500 GB and 1.5 TB (Variable B). The response variable(Y1, Y2, Y3) is the revenue generated per customer(in thousand dollars) who drops this particular model in their shopping cart (the customers configure the details after they insert the base model in their shopping cart).

A @ -1	1.5 Ghz
A @ +1	1.7 Ghz
B @ -1	500GB
B @ +1	1.5 TB

Remember the objective is to maximize the revenue generated per customer(in thousand dollars) who drops this particular model in their shopping cart.

Treatment	A	B	Y1	Y2	Y3	mean Y
1	-1	-1	2.22	2.11	2.14	2.16
2	-1	+1	1.42	1.54	1.05	1.34
3	+1	-1	2.25	2.31	2.21	2.26
4	+1	+1	1	1.38	1.19	1.19

10) What is your recommendation based on a classical analysis?

- ☒ A= -1, B= -1
- ☐ A= -1, B= +1
- ☐ A= +1, B= -1
- ☐ A= +1, B= +1

11) What is your recommendation based on Take The Best?

**1 point**

- ☐ A=-1, B=-1
- ☐ A= -1, B= +1
- ☒ A= +1, B= -1
- ☐ A= +1, B= +1

12) We are performing a K-means clustering that involves 'N' data points. At each iteration we have two major steps: Step1) Identify cluster centers based on currently assigned clusters, Step2) Given the new cluster centers from step 1, assign each data point to a cluster. In the second step, for each data point we would be:

**1 point**

- ☐ computing its distance to the other N-1 data points.
- ☒ computing its distance to the K cluster means.
- ☐ computing the distance to the closest data point from each of the other clusters (K-1).
- ☐ computing the distance to the furthest data point from each of the other clusters (K-1).

13) We are performing agglomerative Hierarchical clustering on N data points. After 'M' steps of merging clusters, how many clusters do you have:

**1 point**

- ☐ It depends on the  $K$  we have selected, as in the  $K$ -means clustering.
- ☐  $M$  clusters.
- ☒  $N-M$  clusters.
- ☐ It depends on which clusters get merged to which at each of the  $M$  steps.