

Unit 9 - Week 7

Course outline

How to access the portal

Week 0 Assignment 0

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

☐ Lecture 36 : Introduction to Computational Learning Theory

☐ Lecture 37 : Sample Complexity : Finite Hypothesis Space

☐ Lecture 38: VC Dimension

☐ Lecture 39: Introduction to Ensembles

☐ Lecture 40: Bagging and Boosting

☒ Tutorial 7

☐ Lecture Notes - Week 7

☐ Quiz : Assignment 7

☐ Feedback For Week 7

Week 8

Assignment Solution

Download Videos

Live Session

Assignment 7

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-09-18, 23:59 IST.

1) Answer Questions 1-3 with the given data:

2 points

Concept learning

We define a concept as the conjunction of literals. For the given instance space, X, find the specific concept using Find-S algorithm.

Sky	AirTemp	Humidity	Wind	EnjoySport
Sunny	Warm	High	Strong	Yes
Sunny	Warm	High	Strong	Yes
Rainy	Cold	Normal	Strong	No
Sunny	Warm	High	Weak	Yes
Cloudy	Cold	Normal	Strong	No

'?' means don't care and '0' indicates no value

- <Sunny,Cold,High,Strong>
- <Sunny, 0, ?, Strong>
- <Sunny, Warm, High, ?>
- <Sunny, 0, Warm, Strong>

- ☐ a
☐ b
☐ c
☐ d

No, the answer is incorrect.
Score: 0

Accepted Answers:
c

2) Find the number of instances possible in X using the possible values that can be seen in the table given in Question 1.

2 points

- 12
- 48
- 36
- 24

- ☐ a
☐ b
☐ c
☐ d

No, the answer is incorrect.
Score: 0

Accepted Answers:
d

3) Find the number of syntactically distinct hypotheses given in the table Question 1.

2 points

Hint: Each attribute can have 2 more values: ? and 0

- 160
- 320
- 80
- 40

- ☐ a
☐ b
☐ c
☐ d

No, the answer is incorrect.
Score: 0

Accepted Answers:
b

4) Answer Questions 4-5 with the given data

2 points

Suppose the instance space, X is the set of real numbers, \mathbf{R} and H be the set of intervals on the real number line. H is of the form $a < x < b$, where a and b may be real constants.

Find VC(H). [VC stands for Vapnik-Chervonenkis Dimension]

- 2
- 3
- 5
- 4

- ☐ a
☐ b
☐ c
☐ d

No, the answer is incorrect.
Score: 0

Accepted Answers:
a

5) Can VC dimension of H be 3?

2 points

- Yes
- No

- ☐ a
☐ b

No, the answer is incorrect.
Score: 0

Accepted Answers:
b

6) Answer questions 6-7 with the given data

2 points

Suppose you have trained three classifiers, each of which returns either 1 or -1, and tested their accuracies to find the following:

Classifier	Accuracy
c1	0.6
c2	0.55
c3	0.45

Let C be the classifier that returns a majority vote of the three classifiers. Assuming the errors of the c_i are independent, what is the probability that C(x) will be correct on a new test example x?

- 0.1815
- 0.1215
- 0.5505
- 0.099

- ☐ a
☐ b
☐ c
☐ d

No, the answer is incorrect.
Score: 0

Accepted Answers:
c

7) Suppose you have run Adaboost on a training set for three boosting iterations. The results are classifiers h_1 , h_2 , and h_3 , with coefficients $\alpha_1 = .2$, $\alpha_2 = -.3$, and $\alpha_3 = -.2$. You find that the classifiers results on a test example x are $h_1(x) = 1$, $h_2(x) = 1$, and $h_3(x) = -1$. What is the class returned by the Adaboost ensemble classifier H on test example x?

2 points

- 1
- 1

- ☐ a
☐ b

No, the answer is incorrect.
Score: 0

Accepted Answers:
a

8) Bagging is done to _____

2 points

- increase bias
- decrease bias
- increase variance
- decrease variance

- ☐ a
☐ b
☐ c
☐ d

No, the answer is incorrect.
Score: 0

Accepted Answers:
d

9) Weak learners are the ones used as classifiers in Boosting algorithms. They are called weak learners because _____

2 points

- Error rate greater than 0.5
- Error rate less than 0.5
- No error

- ☐ a
☐ b
☐ c

No, the answer is incorrect.
Score: 0

Accepted Answers:
b

10) Dropout is used as a regularization technique in Neural Networks where many different models are trained on different subsets of the data. In ensemble learning, dropout techniques would be similar to _____

2 points

- Bagging
- Boosting
- None of the above

- ☐ a
☐ b
☐ c

No, the answer is incorrect.
Score: 0

Accepted Answers:
a