

COMP4432 Quiz 4

Please submit your answer before the deadline: 3:30pm, 15 March 2024. Choose the BEST answer for each question.

Hi, Fu Lai Korris. When you submit this form, the owner will see your name and email address.

1. For k-nearest neighbor (kNN) classifier, which of the followings about bias-variance is correct?



- ☐ The bias of 1NN is higher than that of kNN where k is much larger than 1
- ☒ The variance of 1NN is higher than that of kNN where k is much larger than 1
- ☐ The bias of kNN is always higher than that of decision tree
- ☐ None of the above

Because 1NN is more sensitive to noise than kNN and variance is the error which results from random noise.

2. For neural networks, which of the followings about regularization is correct?



- ☒ Smaller error $E(w|X)$ will be obtained for a smaller regularization parameter lambda value
- ☐ Smaller error $E(w|X)$ will be obtained for a larger regularization parameter lambda value
- ☐ The magnitude of error $E(w|X)$ is independent of the regularization parameter lambda value
- ☐ None of the above

Small lambda will put more weightings on the error term of the cost function during optimization. So, smaller $E(w|X)$ value will be resulted.

3. Which of the followings about bagging and boosting is correct?



- ☐ Bagging can always reduce bias.
- ☒ Boosting can always reduce bias
- ☐ Both bagging and boosting cannot reduce variance
- ☐ None of the above

Both bagging and boosting can reduce variance. Boosting, due to its progressive correction of prediction error. It can always reduce bias and it is the best answer.

Statistics for your reference:

COMP4432 Quiz 4

83

Responses


37:51

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1. For k-nearest neighbor (kNN) classifier, which of the followings about bias-variance is correct?

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- ☐ The bias of 1NN is higher than t... 9
- ☐ The variance of 1NN is higher th... 66
- ☐ The bias of kNN is always highe... 1
- ☐ None of the above 7



2. For neural networks, which of the followings about regularization is correct?

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- ☐ Smaller error $E(w|X)$ will be obtai... 22
- ☐ Smaller error $E(w|X)$ will be obtai... 24
- ☐ The magnitude of error $E(w|X)$ is... 10
- ☐ None of the above 27



3. Which of the followings about bagging and boosting is correct?

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- ☐ Bagging can always reduce bias. 2
- ☐ Boosting can always reduce bias 61
- ☐ Both bagging and boosting can... 0
- ☐ None of the above 20

