MECON6102

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1   Multiple Choice

[50pts]

1. Suppose you would like to estimate a model that predicts y from x, and you think there may be non-linearity. What can you do to test non-linearity?

(a) Run a regression of y on x.

(b) Run a neural networks.

(c) Run an AIC/BIC using non-linear transformations.

(d) Run a logistic regression.

2. Which models is most powerful for risk prediction in modern finance?

(a) Linear regression.

(b) Logistic regression.

(c) Support vector machine.

(d) Kernel support vector machine.

3. What does support vector machine do exactly?

(a) Minimize classification error.

(b) Minimize Mean Squared Error.

(c) Maximize Separating gap.

(d) None of above.

4. In the decision theory, what does temporal difference algorithm do?

(a) Learning the Q function based on reward.

(b) Learning the value function V based on reward

(c) Learning the Q function based on the difference between reward and expected reward.

(d) Learning the value function V based on the difference between reward and expected reward.

5. What is Not right for decision tree?

(a) Good for interpretation.

(b) Robust decision.

(c) More flexible than rule based systems.

(d) Can learn from data.

6. What methods are Not often used in Fraud detection?

(a) Linear regression.

(b) Logistic regression.
(c) Neural Networks.
(d) Random Forest.
7. In random forest algorithm, which is Not ture:
(a) You need to learn many decision trees.
(b) You learn the decision tree from randomize data.
(c) The final decision depends on majority votes from the trees.
(d) You learn as many trees are the sample size.
8. Which of the following is true for clustering:
(a) Clustering can be used to directly predict returns.
(b) Clustering needs labels to be predicted.
(c) K-means algorithm is one way to do clustering.
(d) Support vector machine is one way to do clustering.
9. In high dimensional data, which is true:
(a) You can not use linear regression.
(b) You can not use LASSO.
(c) You can not use AIC/BIC.
(d) You can not use Deep Learning.
10. What is Not the feature of modern natural language processing?
(a) The words are vectorized by clustering.
(b) You can use modern nlp to analyze alternative financial data.
(c) The modern NLP is rule based.
(d) The modern NLP is data based.

2 Short Essay

[50pts]
1. Briefly discuss the difference between modern AI and human intelligence.
2. Write down the formulation of random forest, and briefly discuss the advantage of it.