Assignment for Machine Learning workshop, EVA2023

Hi everyone, please answer these questions based on reviewing the workshop presentation and the five Python notebooks available on the Github page here: https://github.com/sundarjhu/EscueladeVerano_2023

* Indicates required question

1. What is the primary goal of machine learning? *

   Mark only one oval.

   - ◯ To create intelligent machines
   - ◯ To develop algorithms that can think like humans
   - ◯ To enable computers to learn patterns from data and to make predictions
   - ◯ To automate repetitive tasks

2. Which of the following is NOT a supervised learning task? *

   Mark only one oval.

   - ◯ Classification
   - ◯ Regression
   - ◯ Clustering
   - ◯ Natural language processing

3. In machine learning, what is the purpose of a training set? *

   Mark only one oval.

   - ◯ To evaluate the performance of a model
   - ◯ To test the accuracy of a model
   - ◯ To tune hyperparameters of a model
   - ◯ To train a model to learn patterns from labeled examples

4. What is the difference between hyperparameters and parameters in machine learning? *

Mark only one oval.

- ◯ Hyperparameters are learned during training, while parameters are set before training.
- ◯ Hyperparameters control the learning process, while parameters are learned by the model.
- ◯ Hyperparameters define the model's structure, while parameters determine the model's behavior.
- ◯ Hyperparameters are specific to certain algorithms, while parameters are universal across all models.

5. What is the bias of a machine learning model?

Mark only one oval.

- ◯ The difference between predicted and actual values
- ◯ The difference between the average predicted value and the average actual value
- ◯ The tendency of the model to underfit the training data
- ◯ The tendency of the model to overfit the training data

6. What is the variance of a machine learning model? *

Mark only one oval.

- ◯ The difference between predicted and actual values
- ◯ The difference between the average predicted value and the average actual value
- ◯ The tendency of the model to underfit the training data
- ◯ The tendency of the model to overfit the training data

7. What is the main challenge in unsupervised learning? *

Mark only one oval.

- ◯ Finding the optimal hyperparameters
- ◯ Handling missing data in the input features
- ◯ Dealing with imbalanced class distributions
- ◯ Extracting meaningful patterns from unlabeled data

8. What does the bias-variance trade-off refer to in machine learning? *

Mark only one oval.

- ◯ The balance between underfitting and overfitting
- ◯ The trade-off between precision and recall
- ◯ The balance between model complexity and model interpretability
- ◯ The trade-off between training time and prediction time

9. What is the purpose of cross-validation in machine learning? *

Mark only one oval.

- ◯ To divide the dataset into training and testing sets
- ◯ To evaluate the performance of a model on unseen data
- ◯ To compute feature importance
- ◯ To reduce overfitting of a model

10. What is the difference between precision and recall? *

Mark only one oval.

- ◯ Precision measures the proportion of correctly predicted positive instances, while recall measures the proportion of actual positive instances correctly predicted
- ◯ Precision measures the proportion of correctly predicted negative instances, while recall measures the proportion of actual negative instances correctly predicted.
- ◯ Precision measures the accuracy of a model, while recall measures the reliability of a model.
- ◯ Precision measures the ability of a model to generalize, while recall measures the model's complexity.

11. Which evaluation metric is suitable for imbalanced classification problems? * [Hint: think about the imbalanced situation we discussed where we defined accuracy, precision, and recall. What would be the best way to ensure that the underrepresented class is as correctly classified as possible, based on the definitions of these metrics?]

Mark only one oval.

- ◯ Accuracy
- ◯ Mean Squared Error
- ◯ F1 score (the harmonic mean of the precision and recall)
- ◯ R-squared coefficient

12. Which of the following is an example of a hyperparameter? *

Mark only one oval.

- ◯ Weights of a neural network
- ◯ Intercept term in linear regression
- ◯ Number of decision trees in a random forest
- ◯ Coefficients in logistic regression