Quiz : Introduction to Supervised Learning

Please answer the following questions.

* Indicates required question

1. Nom

2. Adresse e-mail

3. Which law or principle is commonly used in machine learning to justify the approach of empirical risk minimization (ERM) and its effectiveness in reducing the expected risk of a model on new data? * 1 point

Mark only one oval.

- ◯ Bayes' Theorem
- ◉ Law of Large Numbers
- ◯ Central Limit Theorem
- ◯ No Free Lunch Theorem

4. In linear regression, under what conditions is minimizing the mean squared error (MSE) equivalent to minimizing the negative log-likelihood? 1 point

Mark only one oval.

- [x] This equivalence holds when the errors in the regression model are assumed to follow a Gaussian distribution with constant variance.
- [ ] This equivalence holds when the regression model includes regularization terms such as L1 or L2 penalties.
- [ ] This equivalence holds when the errors in the regression model are assumed to be uniformly distributed.
- [ ] This equivalence holds only when the regression model is applied to categorical dependent variables.

5. What is the primary criterion used to determine the best split at a node in a decision tree? * 1 point

Mark only one oval.

- [ ] Maximizing the number of data points on one side of the split to ensure purity
- [ ] Minimizing the computational complexity of the model after the split
- [x] Maximizing the homogeneity of the target variable within the subsets created by the split
- [ ] Choosing splits based on the highest correlation between features and the target variable

6. Which of the following actions or model characteristics are influenced by the bias-variance trade-off in machine learning? * 2 points

Tick all that apply.

- [x] Increasing the model's complexity by adding more parameters.
- [x] Add more training data Please we refer to the Additional Materials for this specific case
- [x] Using regularization techniques such as L1 or L2 regularization.
- [x] Deciding between using a linear model or a more complex non-linear model.
- [ ] Choosing a learning rate for gradient descent.

7. Do you have any suggestions to improve the Lecture ? *