QF624-2025-W1

Number of participants: 37

1. **In the context of supervised learning, consider a scenario where you are developing a model to predict the price of houses in a city based on features such as square footage, number of bedrooms, proximity to city center, and age of the property. After training your model on a dataset comprising these features and the corresponding house prices, you intend to evaluate its performance. Which of the following evaluation metrics would be most appropriate for assessing the performance of your model, considering the task is a regression problem?**

17 correct answers
out of 21 respondents

	Accuracy	0%	0 votes
	F1 Score	10%	2 votes
✓	Mean Squared Error (MSE)	81%	17 votes
	Precision	10%	2 votes

2. Which of the following best describes the primary goal of unsupervised learning in the context of machine learning?

21 correct answers out of 25 respondents

	To predict the outcome variable based on input features	8%	2 votes
	To classify data into predefined categories	8%	2 votes
✓	To discover the underlying structure of the data without predefined labels	84%	21 votes
	To reinforce the learning model based on the reward received for each prediction	0%	0 votes

3. Optimization algorithms in machine learning are crucial for improving model performance by:

28 correct answers out of 31 respondents

	Decreasing the complexity of the model to ensure it can be understood and interpreted by humans.	3%	1 vote
	Increasing the size of the dataset automatically to enhance the model's accuracy.	6%	2 votes
✓	Finding the best parameters that minimize or maximize an objective function, often related to loss or cost, respectively.	90%	28 votes
	Ensuring the model's decisions are ethical and aligned with human values.	0%	0 votes

4. Compared to 10-fold cross validation, what is the typical effect of using leave-one-out cross validation (LOOCV) in terms of the bias and variance of the error estimate?

20 correct answers out of 34 respondents

	LOOCV has higher bias and lower variance	18%	6 votes
✓	LOOCV has lower bias and higher variance	59%	20 votes
	LOOCV has lower bias and lower variance	15%	5 votes
	LOOCV has higher bias and higher variance	9%	3 votes

5. Which learning paradigm is most closely associated with dealing with the exploration versus exploitation dilemma and the credit assignment problem?

24 correct answers out of 33 respondents

	Supervised learning	12%	4 votes
	Unsupervised learning	9%	3 votes
✓	Reinforcement learning	73%	24 votes
	All of the above	6%	2 votes