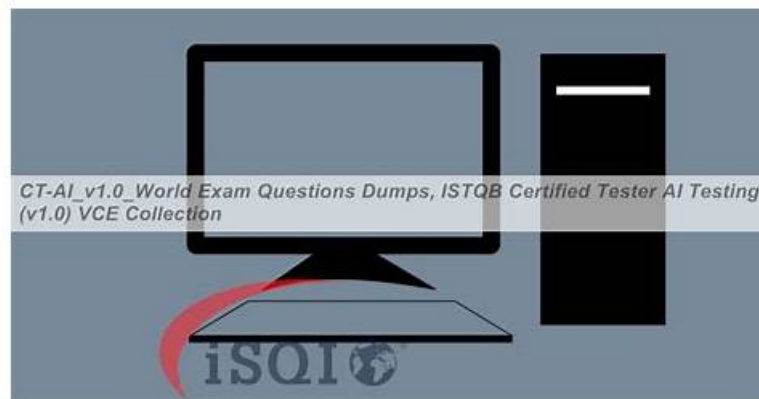


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ISTQB CT-AI Exam Syllabus Topics:

Topic	Details
Topic 1	<ul style="list-style-type: none">Machine Learning ML: This section includes the classification and regression as part of supervised learning, explaining the factors involved in the selection of ML algorithms, and demonstrating underfitting and overfitting.
Topic 2	<ul style="list-style-type: none">ML Functional Performance Metrics: In this section, the topics covered include how to calculate the ML functional performance metrics from a given set of confusion matrices.
Topic 3	<ul style="list-style-type: none">Testing AI-Based Systems Overview: In this section, focus is given to how system specifications for AI-based systems can create challenges in testing and explain automation bias and how this affects testing.

Topic 4	<ul style="list-style-type: none"> Using AI for Testing: In this section, the exam topics cover categorizing the AI technologies used in software testing.
Topic 5	<ul style="list-style-type: none"> ML: Data: This section of the exam covers explaining the activities and challenges related to data preparation. It also covers how to test datasets create an ML model and recognize how poor data quality can cause problems with the resultant ML model.
Topic 6	<ul style="list-style-type: none"> Testing AI-Specific Quality Characteristics: In this section, the topics covered are about the challenges in testing created by the self-learning of AI-based systems.
Topic 7	<ul style="list-style-type: none"> Test Environments for AI-Based Systems: This section is about factors that differentiate the test environments for AI-based
Topic 8	<ul style="list-style-type: none"> Introduction to AI: This exam section covers topics such as the AI effect and how it influences the definition of AI. It covers how to distinguish between narrow AI, general AI, and super AI; moreover, the topics covered include describing how standards apply to AI-based systems.

ISTQB Certified Tester AI Testing Exam Sample Questions (Q63-Q68):

NEW QUESTION # 63

Which ONE of the following tests is MOST likely to describe a useful test to help detect different kinds of biases in ML pipeline?
SELECT ONE OPTION

- A. Testing the distribution shift in the training data for inappropriate bias.
- B. Testing the data pipeline for any sources for algorithmic bias.
- **C. Test the model during model evaluation for data bias.**
- D. Check the input test data for potential sample bias.

Answer: C

Explanation:

Detecting biases in the ML pipeline involves various tests to ensure fairness and accuracy throughout the ML process.

* Testing the distribution shift in the training data for inappropriate bias (A): This involves checking if there is any shift in the data distribution that could lead to bias in the model. It is an important test but not the most direct method for detecting biases.

* Test the model during model evaluation for data bias (B): This is a critical stage where the model is evaluated to detect any biases in the data it was trained on. It directly addresses potential data biases in the model.

* Testing the data pipeline for any sources for algorithmic bias (C): This test is crucial as it helps identify biases that may originate from the data processing and transformation stages within the pipeline. Detecting sources of algorithmic bias ensures that the model does not inherit biases from these processes.

* Check the input test data for potential sample bias (D): While this is an important step, it focuses more on the input data and less on the overall data pipeline.

Hence, the most likely useful test to help detect different kinds of biases in the ML pipeline is B. Test the model during model evaluation for data bias.

:

ISTQB CT-AI Syllabus Section 8.3 on Testing for Algorithmic, Sample, and Inappropriate Bias discusses various tests that can be performed to detect biases at different stages of the ML pipeline.

Sample Exam Questions document, Question #32 highlights the importance of evaluating the model for biases.

NEW QUESTION # 64

Which ONE of the following options does NOT describe a challenge for acquiring test data in ML systems?
SELECT ONE OPTION

- **A. Data for the use case is being generated at a fast pace.**
- B. Compliance needs require proper care to be taken of input personal data.
- C. Test data being sourced from public sources.
- D. Nature of data constantly changes with time.

Answer: A

Explanation:

* Challenges for Acquiring Test Data in ML Systems: Compliance needs, the changing nature of data over time, and sourcing data from public sources are significant challenges. Data being generated quickly is generally not a challenge; it can actually be beneficial as it provides more data for training and testing.

* Reference: ISTQB_CT-AI_Syllabus_v1.0, Sections on Data Preparation and Data Quality Issues.

NEW QUESTION # 65

Upon testing a model used to detect rotten tomatoes, the following data was observed by the test engineer, based on certain number of tomato images.

Confusion Matrix		
	Actually Rotten	Actually Fresh
Predicted Rotten	45	8
Predicted Fresh	5	42

For this confusion matrix which combinations of values of accuracy, recall, and specificity respectively is CORRECT?
SELECT ONE OPTION

- A. 0.87, 0.9, 0.84
- B. 1, 0.9, 0.8
- C. 0.84, 1, 0.9
- D. 1, 0.87, 0.84

Answer: A

Explanation:

To calculate the accuracy, recall, and specificity from the confusion matrix provided, we use the following formulas:

* Confusion Matrix:

* Actually Rotten: 45 (True Positive), 8 (False Positive)

* Actually Fresh: 5 (False Negative), 42 (True Negative)

* Accuracy:

* Accuracy is the proportion of true results (both true positives and true negatives) in the total population.

* Formula: $\text{Accuracy} = \frac{TP + TN}{TP + TN + FP + FN}$

* Calculation: $\text{Accuracy} = \frac{45 + 42}{45 + 42 + 8 + 5} = \frac{87}{100} = 0.87$

* Recall (Sensitivity):

* Recall is the proportion of true positive results in the total actual positives.

* Formula: $\text{Recall} = \frac{TP}{TP + FN}$

* Calculation: $\text{Recall} = \frac{45}{45 + 5} = \frac{45}{50} = 0.9$

* Specificity:

* Specificity is the proportion of true negative results in the total actual negatives.

* Formula: $\text{Specificity} = \frac{TN}{TN + FP}$

* Calculation: $\text{Specificity} = \frac{42}{42 + 8} = \frac{42}{50} = 0.84$

Therefore, the correct combinations of accuracy, recall, and specificity are 0.87, 0.9, and 0.84 respectively.

References:

ISTQB CT-AI Syllabus, Section 5.1, Confusion Matrix, provides detailed formulas and explanations for calculating various metrics including accuracy, recall, and specificity.

"ML Functional Performance Metrics" (ISTQB CT-AI Syllabus, Section 5).

NEW QUESTION # 66

A ML engineer is trying to determine the correctness of the new open-source implementation "X", of a supervised regression algorithm implementation. R-Square is one of the functional performance metrics used to determine the quality of the model. Which ONE of the following would be an APPROPRIATE strategy to achieve this goal?

SELECT ONE OPTION

- A. Drop 10% of the rows randomly and create another model and compare the R-Square scores of both the models.
- B. Train various models by changing the order of input features and verify that the R-Square score of these models vary significantly.
- C. Add 10% of the rows randomly and create another model and compare the R-Square scores of both the model.
- **D. Compare the R-Square score of the model obtained using two different implementations that utilize two different programming languages while using the same algorithm and the same training and testing data.**

Answer: D

Explanation:

A . Add 10% of the rows randomly and create another model and compare the R-Square scores of both the models.

Adding more data to the training set can affect the R-Square score, but it does not directly verify the correctness of the implementation.

B . Train various models by changing the order of input features and verify that the R-Square score of these models vary significantly.

Changing the order of input features should not significantly affect the R-Square score if the implementation is correct, but this approach is more about testing model robustness rather than correctness of the implementation.

C . Compare the R-Square score of the model obtained using two different implementations that utilize two different programming languages while using the same algorithm and the same training and testing data.

This approach directly compares the performance of two implementations of the same algorithm. If both implementations produce similar R-Square scores on the same training and testing data, it suggests that the new implementation "X" is correct.

D . Drop 10% of the rows randomly and create another model and compare the R-Square scores of both the models.

Dropping data can lead to variations in the R-Square score but does not directly verify the correctness of the implementation.

Therefore, option C is the most appropriate strategy because it directly compares the performance of the new implementation "X" with another implementation using the same algorithm and datasets, which helps in verifying the correctness of the implementation.

NEW QUESTION # 67

Which ONE of the following options is the MOST APPROPRIATE stage of the ML workflow to set model and algorithm hyperparameters?

SELECT ONE OPTION

- A. Evaluating the model
- B. Deploying the model
- **C. Tuning the model**
- D. Data testing

Answer: C

Explanation:

Setting model and algorithm hyperparameters is an essential step in the machine learning workflow, primarily occurring during the tuning phase.

* Evaluating the model (A): This stage involves assessing the model's performance using metrics and does not typically include the setting of hyperparameters.

* Deploying the model (B): Deployment is the stage where the model is put into production and used in real-world applications. Hyperparameters should already be set before this stage.

* Tuning the model (C): This is the correct stage where hyperparameters are set. Tuning involves adjusting the hyperparameters to optimize the model's performance.

* Data testing (D): Data testing involves ensuring the quality and integrity of the data used for training and testing the model. It does not include setting hyperparameters.

Hence, the most appropriate stage of the ML workflow to set model and algorithm hyperparameters is C.

Tuning the model.

:

ISTQB CT-AI Syllabus Section 3.2 on the ML Workflow outlines the different stages of the ML process, including the tuning phase where hyperparameters are set.

Sample Exam Questions document, Question #31 specifically addresses the stage in the ML workflow where hyperparameters are configured.

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