

ISTQB

Exam Questions CT-AI

Certified Tester AI Testing Exam



NEW QUESTION 1

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. Add 10% of the rows randomly and create another model and compare the R-Square scores of both the model.
- B. Train various models by changing the order of input features and verify that the R- Square score of these models vary significantly.
- 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.
- D. Drop 10% of the rows randomly and create another model and compare the R-Square scores of both the models.

Answer: C

Explanation:

? A. Add 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. 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.
? D. Drop 10% of the rows randomly and create another model and compare the R- Square scores of both the models.
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 2

A software component uses machine learning to recognize the digits from a scan of handwritten numbers. In the scenario above, which type of Machine Learning (ML) is this an example of?

SELECT ONE OPTION

- A. Reinforcement learning
- B. Regression
- C. Classification
- D. Clustering

Answer: C

Explanation:

Recognizing digits from a scan of handwritten numbers using machine learning is an example of classification. Here's a breakdown:
? Classification: This type of machine learning involves categorizing input data into predefined classes. In this scenario, the input data (handwritten digits) are classified into one of the 10 digit classes (0-9).
? Why Not Other Options:
References: The explanation is based on the definitions of different machine learning types as outlined in the ISTQB CT-AI syllabus, specifically under supervised learning and classification.

NEW QUESTION 3

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.
References:
? 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.

NEW QUESTION 4

Which ONE of the following types of coverage SHOULD be used if test cases need to cause each neuron to achieve both positive and negative activation values?
SELECT ONE OPTION

- A. Value coverage
- B. Threshold coverage
- C. Sign change coverage
- D. Neuron coverage

Answer: C

Explanation:

Coverage for Neuron Activation Values: Sign change coverage is used to ensure that test cases cause each neuron to achieve both positive and negative activation values. This type of coverage ensures that the neurons are thoroughly tested under different activation states.

Reference: ISTQB_CT-AI_Syllabus_v1.0, Section 6.2 Coverage Measures for Neural Networks, which details different types of coverage measures, including sign change coverage.

NEW QUESTION 5

Max. Score: 2

AI-enabled medical devices are used nowadays for automating certain parts of the medical diagnostic processes. Since these are life-critical process the relevant authorities are considering bringing about suitable certifications for these AI enabled medical devices. This certification may involve several facets of AI testing (I - V).

A. I.Autonomy II.Maintainability III.Safety IV.Transparency V.Side EffectsWhich ONE of the following options contains the three MOST required aspects to be satisfied for the above scenario of certification of AI enabled medical devices?SELECT ONE OPTION

- B. Aspects II, III and IV
- C. Aspects I, II, and III
- D. Aspects III, IV, and V
- E. Aspects I, IV, and V

Answer: C

Explanation:

For AI-enabled medical devices, the most required aspects for certification are safety, transparency, and side effects. Here??s why:

? Safety (Aspect III): Critical for ensuring that the AI system does not cause harm to patients.

? Transparency (Aspect IV): Important for understanding and verifying the decisions made by the AI system.

? Side Effects (Aspect V): Necessary to identify and mitigate any unintended consequences of the AI system.

Why Not Other Options:

? Autonomy and Maintainability (Aspects I and II): While important, they are secondary to the immediate concerns of safety, transparency, and managing side effects in life-critical processes.

References: This explanation is aligned with the critical quality characteristics for AI-based systems as mentioned in the ISTQB CT-AI syllabus, focusing on the certification of medical devices.

NEW QUESTION 6

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. Test the model during model evaluation for data bias.
- C. Testing the data pipeline for any sources for algorithmic bias.
- D. Check the input test data for potential sample bias.

Answer: B

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.

References:

? 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 7

Arihant Meditation is a startup using AI to aid people in deeper and better meditation based on analysis of various factors such as time and duration of the meditation, pulse and blood pressure, EEG patters etc. among others. Their model accuracy and other functional performance parameters have not yet reached their desired level.

Which ONE of the following factors is NOT a factor affecting the ML functional performance?

SELECT ONE OPTION

- A. The data pipeline
- B. The quality of the labeling
- C. Biased data
- D. The number of classes

Answer: D

Explanation:

Factors Affecting ML Functional Performance: The data pipeline, quality of the labeling, and biased data are all factors that significantly affect the performance of

machine learning models. The number of classes, while relevant for the model structure, is not a direct factor affecting the performance metrics such as accuracy or bias.

Reference: ISTQB_CT-AI_Syllabus_v1.0, Sections on Data Quality and its Effect on the ML Model and ML Functional Performance Metrics.

NEW QUESTION 8

In the near future, technology will have evolved, and AI will be able to learn multiple tasks by itself without needing to be retrained, allowing it to operate even in new environments. The cognitive abilities of AI are similar to a child of 1-2 years.??

In the above quote, which ONE of the following options is the correct name of this type of AI?

SELECT ONE OPTION

- A. Technological singularity
- B. Narrow AI
- C. Super AI
- D. General AI

Answer: D

Explanation:

* A. Technological singularity

? Technological singularity refers to a hypothetical point in the future when AI surpasses human intelligence and can continuously improve itself without human intervention. This scenario involves capabilities far beyond those described in the question.

* B. Narrow AI

? Narrow AI, also known as weak AI, is designed to perform a specific task or a narrow range of tasks. It does not have general cognitive abilities and cannot learn multiple tasks by itself without retraining.

* C. Super AI

? Super AI refers to an AI that surpasses human intelligence and capabilities across all fields. This is an advanced concept and not aligned with the description of having cognitive abilities similar to a young child.

* D. General AI

? General AI, or strong AI, has the ability to understand, learn, and apply knowledge across a wide range of tasks, similar to human cognitive abilities. It aligns with the description of AI that can learn multiple tasks and operate in new environments without needing retraining.

NEW QUESTION 9

Written requirements are given in text documents, which ONE of the following options is the BEST way to generate test cases from these requirements?

SELECT ONE OPTION

- A. Natural language processing on textual requirements
- B. Analyzing source code for generating test cases
- C. Machine learning on logs of execution
- D. GUI analysis by computer vision

Answer: A

Explanation:

When written requirements are given in text documents, the best way to generate test cases is by using Natural Language Processing (NLP). Here's why:

? Natural Language Processing (NLP): NLP can analyze and understand human language. It can be used to process textual requirements to extract relevant information and generate test cases. This method is efficient in handling large volumes of textual data and identifying key elements necessary for testing.

? Why Not Other Options:

References: This aligns with the methodology discussed in the syllabus under the section on using AI for generating test cases from textual requirements.

NEW QUESTION 10

Which ONE of the following combinations of Training, Validation, Testing data is used during the process of learning/creating the model?

SELECT ONE OPTION

- A. Training data - validation data - test data
- B. Training data - validation data
- C. Training data • test data
- D. Validation data - test data

Answer: A

Explanation:

The process of developing a machine learning model typically involves the use of three types of datasets:

? Training Data: This is used to train the model, i.e., to learn the patterns and relationships in the data.

? Validation Data: This is used to tune the model??s hyperparameters and to prevent overfitting during the training process.

? Test Data: This is used to evaluate the final model??s performance and to estimate how it will perform on unseen data.

Let's analyze each option:

? A. Training data - validation data - test data

? B. Training data - validation data

? C. Training data - test data

? D. Validation data - test data

Therefore, the correct answer is A because it includes all necessary datasets used during the process of learning and creating the model: training, validation, and test data.

NEW QUESTION 10

Which ONE of the following tests is LEAST likely to be performed during the ML model testing phase?

SELECT ONE OPTION

- A. Testing the accuracy of the classification model.
- B. Testing the API of the service powered by the ML model.
- C. Testing the speed of the training of the model.
- D. Testing the speed of the prediction by the model.

Answer: C

Explanation:

The question asks which test is least likely to be performed during the ML model testing phase. Let's consider each option:
? Testing the accuracy of the classification model (A): Accuracy testing is a fundamental part of the ML model testing phase. It ensures that the model correctly classifies the data as intended and meets the required performance metrics.
? Testing the API of the service powered by the ML model (B): Testing the API is crucial, especially if the ML model is deployed as part of a service. This ensures that the service integrates well with other systems and that the API performs as expected.
? Testing the speed of the training of the model (C): This is least likely to be part of the ML model testing phase. The speed of training is more relevant during the development phase when optimizing and tuning the model. During testing, the focus is more on the model's performance and behavior rather than how quickly it was trained.
? Testing the speed of the prediction by the model (D): Testing the speed of prediction is important to ensure that the model meets performance requirements in a production environment, especially for real-time applications.
References:
? ISTQB CT-AI Syllabus Section 3.2 on ML Workflow and Section 5 on ML Functional Performance Metrics discuss the focus of testing during the model testing phase, which includes accuracy and prediction speed but not the training speed.

NEW QUESTION 13

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

Answer: A

Explanation:

To calculate the accuracy, recall, and specificity from the confusion matrix provided, we use the following formulas:
? Confusion Matrix:
? Accuracy:
? Recall (Sensitivity):
? Specificity:
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 16

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