

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

"AllerEgo" is a product that uses self-learning to predict the behavior of a pilot under combat situation for a variety of terrains and enemy aircraft formations. Post training the model was exposed to the real-world data and the model was found to be behaving poorly. A lot of data quality tests had been performed on the data to bring it into a shape fit for training and testing.

Which ONE of the following options is least likely to describes the possible reason for the fall in the performance, especially when considering the self-learning nature of the AI system?

- A. The difficulty of defining criteria for improvement before the model can be accepted.
- B. The fast pace of change did not allow sufficient time for testing.
- C. The unknown nature and insufficient specification of the operating environment might have caused the poor performance.
- D. There was an algorithmic bias in the AI system.

Answer: A

Explanation:

? A. The difficulty of defining criteria for improvement before the model can be accepted.

? B. The fast pace of change did not allow sufficient time for testing.

? C. The unknown nature and insufficient specification of the operating environment might have caused the poor performance.

? D. There was an algorithmic bias in the AI system.

Given the context of the self-learning nature and the need for real-time adaptability, option A is least likely to describe the fall in performance because it deals with acceptance criteria rather than real-time performance issues.

NEW QUESTION 3

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 4

The activation value output for a neuron in a neural network is obtained by applying computation to the neuron.

Which ONE of the following options BEST describes the inputs used to compute the activation value?

SELECT ONE OPTION

- A. Individual bias at the neuron level, activation values of neurons in the previous layer, and weights assigned to the connections between the neurons.
- B. Activation values of neurons in the previous layer, and weights assigned to the connections between the neurons.
- C. Individual bias at the neuron level, and weights assigned to the connections between the neurons.
- D. Individual bias at the neuron level, and activation values of neurons in the previous layer.

Answer: A

Explanation:

In a neural network, the activation value of a neuron is determined by a combination of inputs from the previous layer, the weights of the connections, and the bias at the neuron level. Here's a detailed breakdown:

? Inputs for Activation Value:

? Calculation:

? Why Option A is Correct:

? Eliminating Other Options:

References:

? ISTQB CT-AI Syllabus, Section 6.1, Neural Networks, discusses the components and functioning of neurons in a neural network.

? "Neural Network Activation Functions" (ISTQB CT-AI Syllabus, Section 6.1.1).

NEW QUESTION 5

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 6

Which ONE of the following describes a situation of back-to-back testing the LEAST? SELECT ONE OPTION

- A. Comparison of the results of a current neural network model ML model implemented in platform A (for example Pytorch) with a similar neural network model ML model implemented in platform B (for example Tensorflow), for the same data.
- B. Comparison of the results of a home-grown neural network model ML model with results in a neural network model implemented in a standard implementation (for example Pytorch) for same data
- C. Comparison of the results of a neural network ML model with a current decision tree ML model for the same data.
- D. Comparison of the results of the current neural network ML model on the current data set with a slightly modified data set.

Answer: C

Explanation:

Back-to-back testing is a method where the same set of tests are run on multiple implementations of the system to compare their outputs. This type of testing is typically used to ensure consistency and correctness by comparing the outputs of different implementations under identical conditions. Let's analyze the options given:

? A. Comparison of the results of a current neural network model ML model

implemented in platform A (for example Pytorch) with a similar neural network model ML model implemented in platform B (for example Tensorflow), for the same data.

? B. Comparison of the results of a home-grown neural network model ML model

with results in a neural network model implemented in a standard implementation (for example Pytorch) for the same data.

? C. Comparison of the results of a neural network ML model with a current decision

tree ML model for the same data.

? D. Comparison of the results of the current neural network ML model on the current data set with a slightly modified data set.

Based on this analysis, option C is the one that describes a situation of back-to-back testing the least because it compares two fundamentally different models, which is not the intent of back-to-back testing.

NEW QUESTION 7

Data used for an object detection ML system was found to have been labelled incorrectly in many cases.

Which ONE of the following options is most likely the reason for this problem? SELECT ONE OPTION

- A. Security issues
- B. Accuracy issues
- C. Privacy issues
- D. Bias issues

Answer: B

Explanation:

The question refers to a problem where data used for an object detection ML system was labelled incorrectly. This issue is most closely related to "accuracy issues." Here's a detailed Explanation

? Accuracy Issues: The primary goal of labeling data in machine learning is to

ensure that the model can accurately learn and make predictions based on the given labels. Incorrectly labeled data directly impacts the model's accuracy, leading to poor performance because the model learns incorrect patterns.

? Why Not Other Options:

References: This explanation is consistent with the concepts covered in the ISTQB CT-AI syllabus under dataset quality issues and their impact on machine learning models.

NEW QUESTION 8

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 Effects Which 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 9

Which ONE of the following options describes the LEAST LIKELY usage of AI for detection of GUI changes due to changes in test objects? SELECT ONE OPTION

- A. Using a pixel comparison of the GUI before and after the change to check the differences.
B. Using a computer vision to compare the GUI before and after the test object changes.
C. Using a vision-based detection of the GUI layout changes before and after test object changes.
D. Using a ML-based classifier to flag if changes in GUI are to be flagged for humans.

Answer: A

Explanation:

* A. Using a pixel comparison of the GUI before and after the change to check the differences.

? Pixel comparison is a traditional method and does not involve AI. It compares images at the pixel level, which can be effective but is not an intelligent approach. It is not considered an AI usage and is the least likely usage of AI for detecting GUI changes.

* B. Using computer vision to compare the GUI before and after the test object changes.

? Computer vision involves using AI techniques to interpret and process images. It is a likely usage of AI for detecting changes in the GUI.

* C. Using vision-based detection of the GUI layout changes before and after test object changes.

? Vision-based detection is another AI technique where the layout and structure of the GUI are analyzed to detect changes. This is a typical application of AI.

* D. Using a ML-based classifier to flag if changes in GUI are to be flagged for humans.

? An ML-based classifier can intelligently determine significant changes and decide if they need human review, which is a sophisticated AI application.

NEW QUESTION 10

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 10

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 11
An image classification system is being trained for classifying faces of humans. The distribution of the data is 70% ethnicity A and 30% for ethnicities B, C and D. Based ONLY on the above information, which of the following options BEST describes the situation of this image classification system?
SELECT ONE OPTION

- A. This is an example of expert system bias.
- B. This is an example of sample bias.
- C. This is an example of hyperparameter bias.
- D. This is an example of algorithmic bias.

Answer: B

Explanation:
? A. This is an example of expert system bias.
? B. This is an example of sample bias.
? C. This is an example of hyperparameter bias.
? D. This is an example of algorithmic bias.
Based on the provided information, option B (sample bias) best describes the situation because the training data is skewed towards ethnicity A, potentially leading to biased model performance.

NEW QUESTION 12
Which ONE of the following options is an example that BEST describes a system with AI- based autonomous functions?
SELECT ONE OPTION

- A. A system that utilizes human beings for all important decisions.
- B. A fully automated manufacturing plant that uses no software.
- C. A system that utilizes a tool like Selenium.
- D. A system that is fully able to respond to its environment.

Answer: D

Explanation:
AI-Based Autonomous Functions: An AI-based autonomous system is one that can respond to its environment without human intervention. The other options either involve human decisions or do not use AI at all.
Reference: ISTQB_CT-AI_Syllabus_v1.0, Sections on Autonomy and Testing Autonomous AI-Based Systems.

NEW QUESTION 16
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 19

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