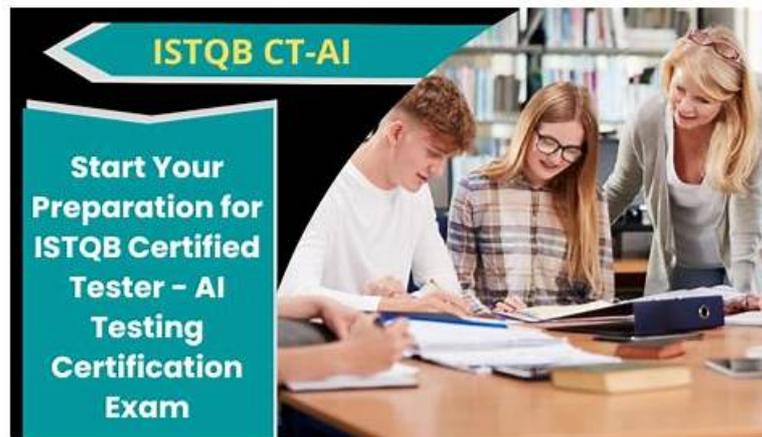


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ISTQB CT-AI Exam Syllabus Topics:

Topic	Details
Topic 1	<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 2	<ul style="list-style-type: none"> Quality Characteristics for AI-Based Systems: This section covers topics covered how to explain the importance of flexibility and adaptability as characteristics of AI-based systems and describes the vitality of managing evolution for AI-based systems. It also covers how to recall the characteristics that make it difficult to use AI-based systems in safety-related applications.
Topic 3	<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 4	<ul style="list-style-type: none"> Methods and Techniques for the Testing of AI-Based Systems: In this section, the focus is on explaining how the testing of ML systems can help prevent adversarial attacks and data poisoning.
Topic 5	<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 6	<ul style="list-style-type: none"> systems from those required for conventional systems.
Topic 7	<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 8	<ul style="list-style-type: none"> Neural Networks and Testing: This section of the exam covers defining the structure and function of a neural network including a DNN and the different coverage measures for neural networks.
Topic 9	<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 10	<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.
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ISTQB CT-AI Certification Exam Questions in 3 User-Friendly Formats

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ISTQB Certified Tester AI Testing Exam Sample Questions (Q82-Q87):

NEW QUESTION # 82

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

Answer: C

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:

* Security Issues: This pertains to data breaches or unauthorized access, which is not relevant to the problem of incorrect data labeling.

* Privacy Issues: This concerns the protection of personal data and is not related to the accuracy of data labeling.

* Bias Issues: While bias in data can affect model performance, it specifically refers to systematic errors or prejudices in the data rather than outright incorrect labeling.

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 # 83

A company is using a spam filter to attempt to identify which emails should be marked as spam. Detection rules are created by the filter that causes a message to be classified as spam. An attacker wishes to have all messages internal to the company be classified as spam. So, the attacker sends messages with obvious red flags in the body of the email and modifies the "from" portion of the email to make it appear that the emails have been sent by company members. The testers plan to use exploratory data analysis (EDA) to detect the attack and use this information to prevent future adversarial attacks.

How could EDA be used to detect this attack?

- A. EDA can restrict how many inputs can be provided by unique users
- B. EDA can help detect the outlier emails from the real emails
- C. EDA can detect and remove the false emails
- D. EDA cannot be used to detect the attack

Answer: B

Explanation:

The syllabus explains that EDA can be used to analyze data to identify outliers and unusual patterns, which can indicate adversarial attacks like data poisoning:

"Testing to detect data poisoning is possible using EDA, as poisoned data may show up as outliers." (Reference: ISTQB CT-AI Syllabus v1.0, Section 9.1.2, page 67 of 99)

NEW QUESTION # 84

You are testing an autonomous vehicle which uses AI to determine proper driving actions and responses. You have evaluated the parameters and combinations to be tested and have determined that there are too many to test in the time allowed. It has been suggested that you use pairwise testing to limit the parameters. Given the complexity of the software under test, what is likely the outcome from using pairwise testing?

- **A. While the number of tests needed can be reduced, there may still be a large enough set of tests that automation will be required to execute all of them.**
- B. Pairwise cannot be applied to this problem because there is AI involved and the evolving values may result in unexpected results that cannot be verified.
- C. All high priority defects will be identified using this method.
- D. The number of parameters to test can be reduced to less than a dozen.

Answer: A

Explanation:

Pairwise testing is a combinatorial testing technique that reduces the number of test cases by focusing on testing interactions between pairs of parameters rather than all possible combinations. It is widely used in AI-based systems, including autonomous vehicles, where the number of possible input parameter combinations can be extremely high.

* Option A: "The number of parameters to test can be reduced to less than a dozen."

* This is incorrect. While pairwise testing significantly reduces the number of test cases, it does not necessarily limit them to a fixed number like a dozen. The final number of tests depends on the number of parameters and their possible values.

* Option B: "All high priority defects will be identified using this method."

* This is incorrect. While pairwise testing is effective in detecting defects caused by interactions between two parameters, it may not uncover defects resulting from more complex interactions involving three or more parameters.

* Option C: "While the number of tests needed can be reduced, there may still be a large enough set of tests that automation will be required to execute all of them."

* This is the correct answer. Even though pairwise testing reduces the number of test cases, AI-based systems such as autonomous vehicles still have a large number of test scenarios. Therefore, automation is often necessary to execute all test cases within the available time.

* Option D: "Pairwise cannot be applied to this problem because there is AI involved, and the evolving values may result in unexpected results that cannot be verified."

* This is incorrect. Pairwise testing can still be applied to AI-based systems, including those that evolve over time. However, additional testing techniques may be required to verify evolving behavior.

* Pairwise Testing for AI Systems: "Pairwise testing is widely used because it effectively reduces the number of test cases while maintaining defect detection capability".

* Automation Requirement: "In practice, even with pairwise testing, extensive test suites may still require automation".

Analysis of the Answer Options: ISTQB CT-AI Syllabus References:

NEW QUESTION # 85

Which of the following characteristics of AI-based systems make it more difficult to ensure they are safe?

- A. Robustness
- **B. Non-determinism**
- C. Simplicity
- D. Sustainability

Answer: B

Explanation:

AI-based systems often exhibit non-deterministic behavior, meaning they do not always produce the same output for the same input.

This makes ensuring safety more difficult, as the system's behavior can change based on new data, environmental factors, or updates.

* Why Non-determinism Affects Safety:

* In traditional software, the same input always produces the same output.

* In AI systems, outputs vary probabilistically depending on learned patterns and weights.

* This unpredictability makes it harder to verify correctness, reliability, and safety, especially in critical domains like autonomous vehicles, medical AI, and industrial automation.

* A (Simplicity): AI-based systems are typically complex, not simple, which contributes to safety challenges.

* B (Sustainability): While sustainability is an important AI consideration, it does not directly affect safety.

* D (Robustness): Lack of robustness can make AI systems unsafe, but non-determinism is the primary issue that complicates safety verification.

* ISTQB CT-AI Syllabus (Section 2.8: Safety and AI)

* "The characteristics of AI-based systems that make it more difficult to ensure they are safe include: complexity, non-determinism, probabilistic nature, self-learning, lack of transparency, interpretability and explainability, lack of robustness".

Why Other Options Are Incorrect: Supporting References from ISTQB Certified Tester AI Testing Study

Guide: Conclusion: Since non-determinism makes AI behavior unpredictable, complicating safety assurance, the correct answer is C.

NEW QUESTION # 86

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

Answer: C

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 # 87

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