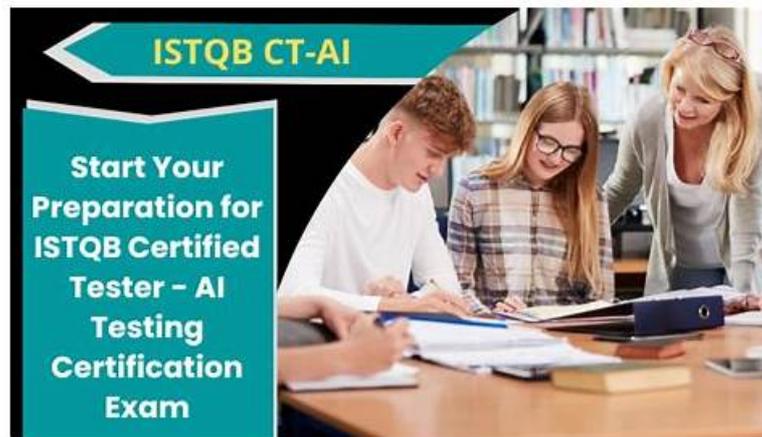


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ISTQB CT-AI Exam Syllabus Topics:

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">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 3	<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 4	<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 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">Test Environments for AI-Based Systems: This section is about factors that differentiate the test environments for AI-based
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.

>> Lab CT-AI Questions <<

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ISTQB Certified Tester AI Testing Exam Sample Questions (Q97-Q102):

NEW QUESTION # 97

Which option describes a reasonable application of AIB testing for a self-learning system after it has changed its behavior due to user input?

Choose ONE option (1 out of 4)

- A. Comparing outputs before and after the change using identical inputs
- B. Comparing outputs of a non-self-learning system with those of the changed self-learning system
- C. Generating test cases for the system before and after the change, since neither has a test oracle
- D. Comparing outputs before and after the change using different inputs

Answer: A

Explanation:

According to Section 4.6 - AI Behaviour Testing (AIB Testing) of the ISTQB CT-AI syllabus, AIB testing is used to evaluate changes in the functional behavior of self-learning systems. The core principle is comparing pre-change and post-change model behavior using the same test inputs, so that any difference in outputs can be attributed to the model's learning and not to differences in input data. This directly corresponds to Option C.

Option A is incorrect because the absence of a test oracle does not justify generating new test cases; AIB relies on reusing identical inputs to detect behavioral drift. Option B is invalid because using different inputs prevents meaningful comparison. Option D is incorrect because comparing with an unrelated non-self-learning system does not allow evaluation of the same model's behavioral evolution.

Thus, Option C accurately represents the correct application of AIB testing: assessing model behavior changes by running identical test inputs before and after learning updates.

NEW QUESTION # 98

A wildlife conservation group would like to use a neural network to classify images of different animals. The algorithm is going to be used on a social media platform to automatically pick out pictures of the chosen animal of the month. This month's animal is set to be a wolf. The test team has already observed that the algorithm could classify a picture of a dog as being a wolf because of the similar characteristics between dogs and wolves. To handle such instances, the team is planning to train the model with additional images of wolves and dogs so that the model is able to better differentiate between the two.

What test method should you use to verify that the model has improved after the additional training?

- A. Back-to-back testing using the version of the model before training and the new version of the model after being trained with additional images
- B. Metamorphic testing because the application domain is not clearly understood at this point
- C. Pairwise testing using combinatorics to look at a long list of photo parameters
- D. Adversarial testing to verify that no incorrect images have been used in the training

Answer: A

Explanation:

The syllabus defines back-to-back testing as a method to compare a modified AI system to the previous version, which is ideal in this scenario:

"Back-to-back testing is performed by comparing the outputs of two systems that are supposed to provide the same outputs, one being a known and trusted system and the other being the test system. This approach can be used to test ML systems after re-training to verify that improvements have not introduced regressions." (Reference: ISTQB CT-AI Syllabus v1.0, Section 9.3, page 67 of 99)

NEW QUESTION # 99

When verifying that an autonomous AI-based system is acting appropriately, which of the following are MOST important to include?

- A. Test cases to verify that the system automatically confirms the correct classification of training data
- **B. Test cases to detect the system prompting for unnecessary human intervention**
- C. Test cases to verify that the system automatically suppresses invalid output data
- D. Test cases to detect the system appropriately automating its data input

Answer: B

Explanation:

The syllabus highlights that testing for unnecessary human intervention is a key focus for autonomous AI- based systems:

"For autonomous AI-based systems, testers must ensure that the system does not prompt for unnecessary human intervention, as this contradicts the autonomy concept." (Reference: ISTQB CT-AI Syllabus v1.0, Section 8.2, page 59 of 99)

NEW QUESTION # 100

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

Answer: B

Explanation:

Exploratory Data Analysis (EDA) is an essential technique for examining datasets to uncover patterns, trends, and anomalies, including outliers. In this case, the attacker manipulates the spam filter by injecting emails with red flags and masking them as internal company emails. The primary goal of EDA here is to detect these adversarial modifications.

* Detecting Outliers:

* EDA techniques such as statistical analysis, clustering, and visualization can reveal patterns in email metadata (e.g., sender details, email content, frequency).

* Outlier detection methods like Z-score, IQR (Interquartile Range), or machine learning-based anomaly detection can identify emails that significantly deviate from typical internal communications.

* Identifying Distribution Shifts:

* By analyzing the frequency and characteristics of emails flagged as spam, testers can detect if the attack has introduced unusual patterns.

* If a surge of internal emails is suddenly classified as spam, EDA can help verify whether these classifications are consistent with historical data.

* Feature Analysis for Adversarial Patterns:

* EDA enables visualization techniques such as scatter plots or histograms to distinguish normal emails from manipulated ones.

* Examining email metadata (e.g., changes in headers, unusual wording in email bodies) can reveal adversarial tactics.

* Counteracting Adversarial Attacks:

* Once anomalies are identified, the spam filter's detection rules can be improved by retraining the model on corrected datasets.

* The adversarial examples can be added to the training data to enhance the robustness of the filter against future attacks.

* Exploratory Data Analysis (EDA) is used to detect outliers and adversarial attacks. "EDA is where data are examined for patterns, relationships, trends, and outliers. It involves the interactive, hypothesis-driven exploration of data."

* EDA can identify poisoned or manipulated data by detecting anomalies and distribution shifts.

"Testing to detect data poisoning is possible using EDA, as poisoned data may show up as outliers."

* EDA helps validate ML models and detect potential vulnerabilities. "The use of exploratory techniques, primarily driven by data visualization, can help validate the ML algorithm being used, identify changes that result in efficient models, and leverage domain expertise." References from ISTQB Certified Tester AI Testing Study Guide Thus, option A is the correct answer, as EDA is specifically useful for detecting outliers, which can help identify manipulated spam emails.

NEW QUESTION # 101

"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?

SELECT ONE OPTION

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

Answer: C

Explanation:

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

* Defining criteria for improvement is a challenge in the acceptance of AI models, but it is not directly related to the performance drop in real-world scenarios. It relates more to the evaluation and deployment phase rather than affecting the model's real-time performance post-deployment.

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

* This can significantly affect the model's performance. If the system is self-learning, it needs to adapt quickly, and insufficient testing time can lead to incomplete learning and poor performance.

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

* This is highly likely to affect performance. Self-learning AI systems require detailed specifications of the operating environment to adapt and learn effectively. If the environment is insufficiently specified, the model may fail to perform accurately in real-world scenarios.

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

* Algorithmic bias can significantly impact the performance of AI systems. If the model has biases, it will not perform well across different scenarios and data distributions.

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 # 102

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