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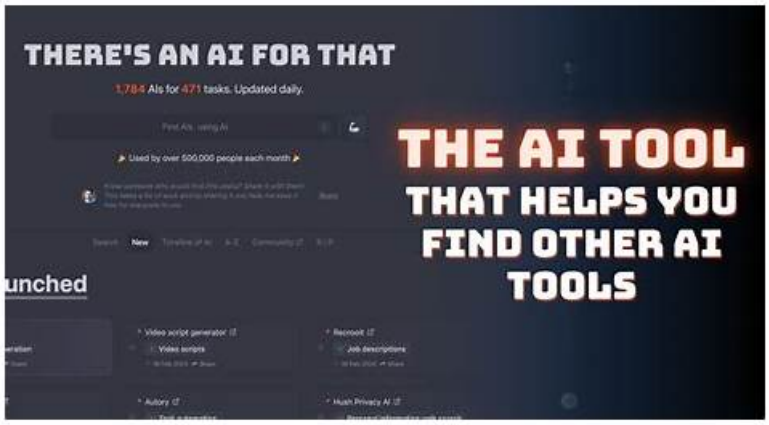

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ISTQB CT-AI Exam Syllabus Topics:

Topic	Details
Topic 1	• Test Environments for AI-Based Systems: This section is about factors that differentiate the test environments for AI-based
Topic 2	• 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 3	• 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.
Topic 4	• 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 5	• 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 6	• 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 7	• 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 8	• 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.

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ISTQB Certified Tester AI Testing Exam Sample Questions (Q100-Q105):

NEW QUESTION # 100
Consider an AI-system in which the complex internal structure has been generated by another software system. Why would the tester choose to do black-box testing on this particular system?

- A. The tester wishes to better understand the logic of the software used to create the internal structure
- B. Test automation can be built quickly and easily from the test cases developed during black-box testing
- C. Black-box testing eliminates the need for the tester to understand the internal structure of the AI-system
- D. The black-box testing method will allow the tester to check the transparency of the algorithm used to create the internal structure

Answer: C

Explanation:
The syllabus explains:
"Where the internal structure of an AI-based system is too complex for humans to understand, the system can only be tested as a black box. Even when the internal structure is visible, this provides no additional useful information to help with testing." This confirms that black-box testing is chosen because the tester does not need to understand the system's internal structure.
(Reference: ISTQB CT-AI Syllabus v1.0, Section 8.5, page 61 of 99)

NEW QUESTION # 101
A system was developed for screening the X-rays of patients for potential malignancy detection (skin cancer).
A workflow system has been developed to screen multiple cancers by using several individually trained ML models chained together in the workflow.
Testing the pipeline could involve multiple kind of tests (I - III):
I.Pairwise testing of combinations
II.Testing each individual model for accuracy
III.A/B testing of different sequences of models
Which ONE of the following options contains the kinds of tests that would be MOST APPROPRIATE to include in the strategy for optimal detection?
SELECT ONE OPTION

- A. Only III
- B. I and III
- C. Only II
- D. I and II

Answer: D

Explanation:
The question asks which combination of tests would be most appropriate to include in the strategy for optimal detection in a workflow system using multiple ML models.
* Pairwise testing of combinations (I): This method is useful for testing interactions between different components in the workflow to ensure they work well together, identifying potential issues in the integration.
* Testing each individual model for accuracy (II): Ensuring that each model in the workflow performs accurately on its own is crucial before integrating them into a combined workflow.
* A/B testing of different sequences of models (III): This involves comparing different sequences to determine which configuration yields the best results. While useful, it might not be as fundamental as pairwise and individual accuracy testing in the initial stages.
References:
* ISTQB CT-AI Syllabus Section 9.2 on Pairwise Testing and Section 9.3 on Testing ML Models emphasize the importance of testing interactions and individual model accuracy in complex ML workflows.

NEW QUESTION # 102
The training of an ML model... What type of bias is LEAST important to look for when testing the model?
Choose ONE option (1 out of 4)

- A. Inappropriate bias
- B. Algorithmic bias
- C. Sample bias
- D. Automation bias

Answer: D

Explanation:
The ISTQB CT-AI syllabus distinguishes between several types of bias relevant in AI testing, including sample bias,algorithmic bias, andinappropriate bias. In Section3.3 - Bias in AI-Based Systems, the syllabus stresses the importance of identifying biases that originate fromtraining data,model development, anddecision logic. Sample bias occurs when the training data does not adequately represent the population; algorithmic bias arises when the model produces systematically skewed results due to learned patterns; inappropriate bias involves ethically or socially problematic distortions in the outcomes. All three of these bias types directly affect theoutputs of the AI modeland are therefore highly relevant when testing an industrial inspection system intended to reliably detect defects. These biases can lead to defective items being missed or false alarms being raised, which impacts quality assurance significantly .
Automation bias, however, is fundamentally different. It refers to ahuman cognitive bias, where users (e.g., inspectors) overly trust or rely on the AI system's output. While important in user-interaction testing, it isnota biaswithin the ML model itself. Since the question asks which bias isleast important when testing the model, automation bias can be legitimately deprioritized duringmodel-level testing. Therefore, OptionBis correct.

NEW QUESTION # 103
A neural network has been designed and created to assist day-traders improve efficiency when buying and selling commodities in a rapidly changing market. Suppose the test team executes a test on the neural network where each neuron is examined. For this network, the shortest path indicates a "buy" and it will only occur when the one-day predicted value of the commodity is greater than the spot price by 0.75%. The neurons are stimulated by entering commodity prices and testers verify that they activate only when the future value exceeds the spot price by at least 0.75%.
Which of the following statements BEST explains the type of coverage being tested on the neural network?

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

Answer: A

Explanation:
The syllabus details that threshold coverage requires each neuron to achieve an activation value greater than a specified threshold: "Threshold coverage: Full threshold coverage requires that each neuron in the neural network achieves an activation value greater than a specified threshold." (Reference: ISTQB CT-AI Syllabus v1.0, Section 6.2, page 48 of 99)

NEW QUESTION # 104
A bank wants to use an algorithm to determine which applicants should be given a loan. The bank hires a data scientist to construct a logistic regression model to predict whether the applicant will repay the loan or not.
The bank has enough data on past customers to randomly split the data into a training data set and a test
/validation data set. A logistic regression model is constructed on the training data set using the following independent variables:
Gender
Marital status
Number of dependents
Education
Income
Loan amount
Loan term

Credit score
The model reveals that those with higher credit scores and larger total incomes are more likely to repay their loans. The data scientist has suggested that there might be bias present in the model based on previous models created for other banks.
Given this information, what is the best test approach to check for potential bias in the model?

- A. Back-to-back testing should be used to compare the model created using the training data set to another model created using the test data set, if the two models significantly differ, it will indicate there is bias in the original model.
- B. Experienced-based testing should be used to confirm that the training data set is operationally relevant. This can include applying exploratory data analysis (EDA) to check for bias within the training data set.
- C. Acceptance testing should be used to make sure the algorithm is suitable for the customer. The team can re-work the acceptance criteria such that the algorithm is sure to correctly predict the remaining applicants that have been set aside for the validation data set ensuring no bias is present.
- D. A/B testing should be used to verify that the test data set does not detect any bias that might have been introduced by the original training data. If the two models significantly differ, it will indicate there is bias in the original model.

Answer: B

Explanation:
Bias in an AI system occurs when the training data contains inherent prejudices that cause the model to make unfair predictions. Experience-based testing, particularlyExploratory Data Analysis (EDA), helps uncover these biases by analyzing patterns, distributions, and potential discriminatory factors in the training data.
* Option A:"Experience-based testing should be used to confirm that the training data set is operationally relevant. This can include applying exploratory data analysis (EDA) to check for bias within the training data set."
* This is the correct answer. EDA involves examining the dataset for bias, inconsistencies, or missing values, ensuring fairness in ML model predictions.
* Option B:"Back-to-back testing should be used to compare the model created using the training data set to another model created using the test data set. If the two models significantly differ, it will indicate there is bias in the original model."
* Back-to-back testing is used for regression testing and to compare versions of an AI system but is not primarily used to detect bias.
* Option C:"Acceptance testing should be used to make sure the algorithm is suitable for the customer.
The team can re-work the acceptance criteria such that the algorithm is sure to correctly predict the remaining applicants that have been set aside for the validation data set ensuring no bias is present."
* Acceptance testing focuses on meeting predefined business requirements rather than detecting and mitigating bias.
* Option D:"A/B testing should be used to verify that the test data set does not detect any bias that might have been introduced by the original training data. If the two models significantly differ, it will indicate there is bias in the original model."
* A/B testing is used for evaluating variations of a model rather than for explicitly identifying bias.
* Bias Testing Methods:"AI-based systems should be tested for algorithmic bias, sample bias, and inappropriate bias. Experience-based testing and EDA are useful for detecting bias".
* Exploratory Data Analysis (EDA):"EDA helps uncover potential bias in training data through visualization and statistical analysis".
Analysis of the Answer Options:ISTQB CT-AI Syllabus References:Thus,Option A is the best choice for detecting bias in the loan applicant model.

NEW QUESTION # 105
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