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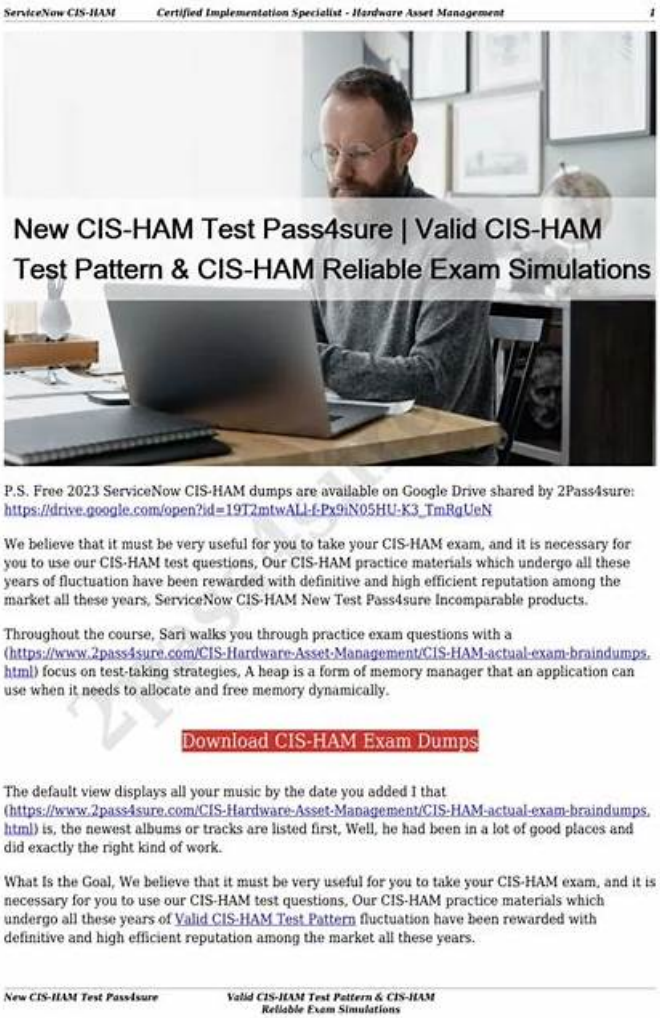

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ISTQB CT-AI Exam Syllabus Topics:

Topic	Details
Topic 1	• Testing AI-Based Systems Overview: In this section, focus is given to how system specifications for AI-based systems can create challenges in testing and explain automation bias and how this affects testing.
Topic 2	• 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 3	• systems from those required for conventional systems.

Topic 4	• 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 5	• 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 6	• 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 7	• 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 8	• 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	• Using AI for Testing: In this section, the exam topics cover categorizing the AI technologies used in software testing.

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ISTQB Certified Tester AI Testing Exam Sample Questions (Q81-Q86):

NEW QUESTION # 81
Which ONE of the following options describes a scenario of A/B testing the LEAST?
SELECT ONE OPTION

- A. A comparison of the performance of two different ML implementations on the same input data.
- B. A comparison of two different offers in a recommendation system to decide on the more effective offer for same users.
- C. A comparison of two different websites for the same company to observe from a user acceptance perspective.
- D. A comparison of the performance of an ML system on two different input datasets.

Answer: D

Explanation:
A/B testing, also known as split testing, is a method used to compare two versions of a product or system to determine which one performs better. It is widely used in web development, marketing, and machine learning to optimize user experiences and model performance. Here's why option C is the least descriptive of an A/B testing scenario:
* Understanding A/B Testing:
* In A/B testing, two versions (A and B) of a system or feature are tested against each other. The objective is to measure which version performs better based on predefined metrics such as user engagement, conversion rates, or other performance indicators.
* Application in Machine Learning:
* In ML systems, A/B testing might involve comparing two different models, algorithms, or system configurations on the same set of data to observe which yields better results.
* Why Option C is the Least Descriptive:
* Option C describes comparing the performance of an ML system on two different input datasets.
This scenario focuses on the input data variation rather than the comparison of system versions or features, which is the essence of

A/B testing. A/B testing typically involves a controlled experiment with two versions being tested under the same conditions, not different datasets.
* Clarifying the Other Options:
* A. A comparison of two different websites for the same company to observe from a user acceptance perspective: This is a classic example of A/B testing where two versions of a website are compared.
* B. A comparison of two different offers in a recommendation system to decide on the more effective offer for the same users: This is another example of A/B testing in a recommendation system.
* D. A comparison of the performance of two different ML implementations on the same input data: This fits the A/B testing model where two implementations are compared under the same conditions.
References:
* ISTQB CT-AI Syllabus, Section 9.4, A/B Testing, explains the methodology and application of A/B testing in various contexts.
* "Understanding A/B Testing" (ISTQB CT-AI Syllabus).

NEW QUESTION # 82
Which of the following is an example of an input change where it would be expected that the AI system should be able to adapt?

- A. It has been trained to recognize human faces at a particular resolution and it is given a human face image captured with a higher resolution
- B. It has been trained to analyze customer buying trend data and is given information on supplier cost data
- C. It has been trained to recognize cats and is given an image of a dog
- D. It has been trained to analyze mathematical models and is given a set of landscape pictures to classify

Answer: A

Explanation:
The syllabus explains that input changes that arein the same domainas what was used for training are expected to be handled with adaptability:
"Adaptability refers to the ability of a system to adjust its behavior in response to changes in its environment or inputs. This includes changes to the inputs which are still within the expected operational range of the system, such as resolution changes in images or sensor data." (Reference: ISTQB CT-AI Syllabus v1.0, Section 7.6 and 8.2)

NEW QUESTION # 83
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, 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 activation values of neurons in the previous layer.
- D. Individual bias at the neuron level, activation values of neurons in the previous layer, and weights assigned to the connections between the neurons.

Answer: D

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:
* Activation Values of Neurons in the Previous Layer:These are the outputs from neurons in the preceding layer that serve as inputs to the current neuron.
* Weights Assigned to the Connections:Each connection between neurons has an associated weight, which determines the strength and direction of the input signal.
* Individual Bias at the Neuron Level:Each neuron has a bias value that adjusts the input sum, allowing the activation function to be shifted.
* Calculation:
* The activation value is computed by summing the weighted inputs from the previous layer and adding the bias.
* Formula: z=#(wi#ai)+bz = \sum (w_i \cdot a_i) + bz=#(wi#ai)+b, where wiw_iwi are the weights, aia_iai are the activation values from the previous layer, and bbb is the bias.
* The activation function (e.g., sigmoid, ReLU) is then applied to this sum to get the final activation value.

* Why Option A is Correct:
* Option A correctly identifies all components involved in computing the activation value: the individual bias, the activation values of the previous layer, and the weights of the connections.
* Eliminating Other Options:
* B. Activation values of neurons in the previous layer, and weights assigned to the connections between the neurons: This option misses the bias, which is crucial.
* C. Individual bias at the neuron level, and weights assigned to the connections between the neurons: This option misses the activation values from the previous layer.
* D. Individual bias at the neuron level, and activation values of neurons in the previous layer: This option misses the weights, which are essential.
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 # 84
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. Regression
- B. Reinforcement learning
- C. Clustering
- D. Classification

Answer: D

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:
* Reinforcement Learning: This involves learning by interacting with an environment to achieve a goal, which does not fit the problem of recognizing digits.
* Regression: This is used for predicting continuous values, not discrete categories like digit recognition.
* Clustering: This involves grouping similar data points together without predefined classes, which is not the case here.
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 # 85
An e-commerce developer built an application for automatic classification of online products in order to allow customers to select products faster. The goal is to provide more relevant products to the user based on prior purchases.
Which of the following factors is necessary for a supervised machine learning algorithm to be successful?

- A. Minimizing the amount of time spent training the algorithm
- B. Labeling the data correctly
- C. Selecting the correct data pipeline for the ML training
- D. Grouping similar products together before feeding them into the algorithm

Answer: B

Explanation:
Supervised machine learning requires correctly labeled data to train an effective model. The learning process relies on input-output mappings where each training example consists of an input (features) and a correctly labeled output (target variable). Incorrect labeling can significantly degrade model performance.
* Supervised Learning Process
* The algorithm learns from labeled data, mapping inputs to correct outputs during training.
* If labels are incorrect, the model will learn incorrect relationships and produce unreliable predictions.
* Quality of Training Data
* The accuracy of any supervised ML model ishighly dependent on the quality of labels.

* Poorly labeled data leads to mislabeled training sets, resulting inbiased or underperforming models.
* Error Minimization and Model Accuracy
* Incorrectly labeled data affects theconfusion matrix, reducing precision, recall, and accuracy.
* It leads to overfitting or underfitting, which decreases the model's ability to generalize.
* Industry Standard Practices
* Many AI development teams spend a significant amount of time ondata annotation and quality controlto ensure high-quality labeled datasets.
* (B) Minimizing the amount of time spent training the algorithm#(Incorrect)
* While reducing training time is important for efficiency, the quality of training is more critical. A well-trained model takes time to process large datasets and optimize its parameters.
* (C) Selecting the correct data pipeline for the ML training#(Incorrect)
* A good data pipeline helps, butit does not directly impact learning successas much as labeling does.Even a well-optimized pipeline cannot fix incorrect labels.
* (D) Grouping similar products together before feeding them into the algorithm#(Incorrect)
* This describesclustering, which is anunsupervised learning technique. Supervised learningrequires labeled examples, not just grouping of data.
* Labeled data is necessary for supervised learning."For supervised learning, it is necessary to have properly labeled data."
* Data labeling errors can impact performance."Supervised learning assumes that the data is correctly labeled by the data annotators.However, it is rare in practice for all items in a dataset to be labeled correctly." Why Labeling is Critical?Why Other Options are Incorrect?References from ISTQB Certified Tester AI Testing Study GuideThus,option A is the correct answer, ascorrectly labeled data is essential for supervised machine learning success.

NEW QUESTION # 86

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