



Amazon-Web-Services

Exam Questions MLS-C01

AWS Certified Machine Learning - Specialty

NEW QUESTION 1

A Machine Learning Specialist at a company sensitive to security is preparing a dataset for model training. The dataset is stored in Amazon S3 and contains Personally Identifiable Information (PII). The dataset:

* Must be accessible from a VPC only.

* Must not traverse the public internet. How can these requirements be satisfied?

- A. Create a VPC endpoint and apply a bucket access policy that restricts access to the given VPC endpoint and the VPC.
- B. Create a VPC endpoint and apply a bucket access policy that allows access from the given VPC endpoint and an Amazon EC2 instance.
- C. Create a VPC endpoint and use Network Access Control Lists (NACLs) to allow traffic between only the given VPC endpoint and an Amazon EC2 instance.
- D. Create a VPC endpoint and use security groups to restrict access to the given VPC endpoint and an Amazon EC2 instance.

Answer: B

NEW QUESTION 2

A Machine Learning Specialist built an image classification deep learning model. However the Specialist ran into an overfitting problem in which the training and testing accuracies were 99% and 75%r respectively.

How should the Specialist address this issue and what is the reason behind it?

- A. The learning rate should be increased because the optimization process was trapped at a local minimum.
- B. The dropout rate at the flatten layer should be increased because the model is not generalized enough.
- C. The dimensionality of dense layer next to the flatten layer should be increased because the model is not complex enough.
- D. The epoch number should be increased because the optimization process was terminated before it reached the global minimum.

Answer: D

NEW QUESTION 3

Example Corp has an annual sale event from October to December. The company has sequential sales data from the past 15 years and wants to use Amazon ML to predict the sales for this year's upcoming event. Which method should Example Corp use to split the data into a training dataset and evaluation dataset?

- A. Pre-split the data before uploading to Amazon S3
- B. Have Amazon ML split the data randomly.
- C. Have Amazon ML split the data sequentially.
- D. Perform custom cross-validation on the data

Answer: C

NEW QUESTION 4

A large JSON dataset for a project has been uploaded to a private Amazon S3 bucket The Machine Learning Specialist wants to securely access and explore the data from an Amazon SageMaker notebook instance A new VPC was created and assigned to the Specialist

How can the privacy and integrity of the data stored in Amazon S3 be maintained while granting access to the Specialist for analysis?

- A. Launch the SageMaker notebook instance within the VPC with SageMaker-provided internet access enabled Use an S3 ACL to open read privileges to the everyone group
- B. Launch the SageMaker notebook instance within the VPC and create an S3 VPC endpoint for the notebook to access the data Copy the JSON dataset from Amazon S3 into the ML storage volume on the SageMaker notebook instance and work against the local dataset
- C. Launch the SageMaker notebook instance within the VPC and create an S3 VPC endpoint for the notebook to access the data Define a custom S3 bucket policy to only allow requests from your VPC to access the S3 bucket
- D. Launch the SageMaker notebook instance within the VPC with SageMaker-provided internet access enable
- E. Generate an S3 pre-signed URL for access to data in the bucket

Answer: B

NEW QUESTION 5

A Machine Learning Specialist wants to determine the appropriate SageMakerVariant Invocations Per Instance setting for an endpoint automatic scaling configuration. The Specialist has performed a load test on a single instance and determined that peak requests per second (RPS) without service degradation is about 20 RPS As this is the first deployment, the Specialist intends to set the invocation safety factor to 0.5

Based on the stated parameters and given that the invocations per instance setting is measured on a per-minute basis, what should the Specialist set as the sageMakervariantinvocationsPerinstance setting?

- A. 10
- B. 30
- C. 600
- D. 2,400

Answer: C

NEW QUESTION 6

A Machine Learning Specialist is preparing data for training on Amazon SageMaker The Specialist is transformed into a numpy .array, which appears to be negatively affecting the speed of the training

What should the Specialist do to optimize the data for training on SageMaker'?

- A. Use the SageMaker batch transform feature to transform the training data into a DataFrame
- B. Use AWS Glue to compress the data into the Apache Parquet format
- C. Transform the dataset into the Recordio protobuf format
- D. Use the SageMaker hyperparameter optimization feature to automatically optimize the data

Answer: C

NEW QUESTION 7

A gaming company has launched an online game where people can start playing for free but they need to pay if they choose to use certain features. The company needs to build an automated system to predict whether or not a new user will become a paid user within 1 year. The company has gathered a labeled dataset from 1 million users.

The training dataset consists of 1,000 positive samples (from users who ended up paying within 1 year) and 999.1 negative samples (from users who did not use any paid features). Each data sample consists of 200 features including user age, device, location, and play patterns.

Using this dataset for training, the Data Science team trained a random forest model that converged with over 99% accuracy on the training set. However, the prediction results on a test dataset were not satisfactory.

Which of the following approaches should the Data Science team take to mitigate this issue? (Select TWO.)

- A. Add more deep trees to the random forest to enable the model to learn more features.
- B. Indicate a copy of the samples in the test database in the training dataset.
- C. Generate more positive samples by duplicating the positive samples and adding a small amount of noise to the duplicated data.
- D. Change the cost function so that false negatives have a higher impact on the cost value than false positives.
- E. Change the cost function so that false positives have a higher impact on the cost value than false negatives.

Answer: BD

NEW QUESTION 8

A Machine Learning Specialist was given a dataset consisting of unlabeled data. The Specialist must create a model that can help the team classify the data into different buckets. What model should be used to complete this work?

- A. K-means clustering
- B. Random Cut Forest (RCF)
- C. XGBoost
- D. BlazingText

Answer: A

NEW QUESTION 9

A Machine Learning Specialist is developing a recommendation engine for a photography blog. Given a picture, the recommendation engine should show a picture that captures similar objects. The Specialist would like to create a numerical representation feature to perform nearest-neighbor searches.

What actions would allow the Specialist to get relevant numerical representations?

- A. Reduce image resolution and use reduced resolution pixel values as features.
- B. Use Amazon Mechanical Turk to label image content and create a one-hot representation indicating the presence of specific labels.
- C. Run images through a neural network pre-trained on ImageNet, and collect the feature vectors from the penultimate layer.
- D. Average colors by channel to obtain three-dimensional representations of images.

Answer: A

NEW QUESTION 10

The Chief Editor for a product catalog wants the Research and Development team to build a machine learning system that can be used to detect whether or not individuals in a collection of images are wearing the company's retail brand. The team has a set of training data.

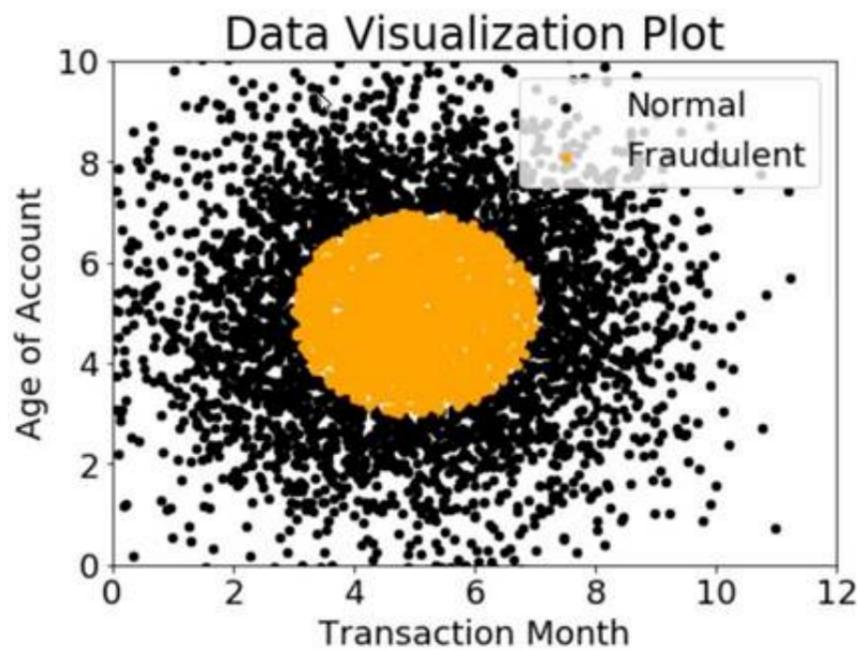
Which machine learning algorithm should the researchers use that BEST meets their requirements?

- A. Latent Dirichlet Allocation (LDA)
- B. Recurrent neural network (RNN)
- C. K-means
- D. Convolutional neural network (CNN)

Answer: C

NEW QUESTION 10

A company wants to classify user behavior as either fraudulent or normal. Based on internal research, a Machine Learning Specialist would like to build a binary classifier based on two features: age of account and transaction month. The class distribution for these features is illustrated in the figure provided.



Based on this information, which model would have the HIGHEST recall with respect to the fraudulent class?

- A. Decision tree
- B. Linear support vector machine (SVM)
- C. Naive Bayesian classifier
- D. Single Perceptron with sigmoidal activation function

Answer: C

NEW QUESTION 15

An agency collects census information within a country to determine healthcare and social program needs by province and city. The census form collects responses for approximately 500 questions from each citizen

Which combination of algorithms would provide the appropriate insights? (Select TWO)

- A. The factorization machines (FM) algorithm
- B. The Latent Dirichlet Allocation (LDA) algorithm
- C. The principal component analysis (PCA) algorithm
- D. The k-means algorithm
- E. The Random Cut Forest (RCF) algorithm

Answer: CD

Explanation:

The PCA and K-means algorithms are useful in collection of data using census form.

NEW QUESTION 20

A Machine Learning Specialist has created a deep learning neural network model that performs well on the training data but performs poorly on the test data. Which of the following methods should the Specialist consider using to correct this? (Select THREE.)

- A. Decrease regularization.
- B. Increase regularization.
- C. Increase dropout.
- D. Decrease dropout.
- E. Increase feature combinations.
- F. Decrease feature combinations.

Answer: BDE

NEW QUESTION 22

While working on a neural network project, a Machine Learning Specialist discovers that some features in the data have very high magnitude resulting in this data being weighted more in the cost function. What should the Specialist do to ensure better convergence during backpropagation?

- A. Dimensionality reduction
- B. Data normalization
- C. Model regularization
- D. Data augmentation for the minority class

Answer: D

NEW QUESTION 24

A Machine Learning Specialist is working with a large company to leverage machine learning within its products. The company wants to group its customers into categories based on which customers will and will not churn within the next 6 months. The company has labeled the data available to the Specialist.

Which machine learning model type should the Specialist use to accomplish this task?

- A. Linear regression
- B. Classification
- C. Clustering
- D. Reinforcement learning

Answer: B

Explanation:

The goal of classification is to determine to which class or category a data point (customer in our case) belongs to. For classification problems, data scientists would use historical data with predefined target variables AKA labels (churner/non-churner) – answers that need to be predicted – to train an algorithm. With classification,

businesses can answer the following questions:

- > Will this customer churn or not?
- > Will a customer renew their subscription?
- > Will a user downgrade a pricing plan?
- > Are there any signs of unusual customer behavior?

NEW QUESTION 26

A large mobile network operating company is building a machine learning model to predict customers who are likely to unsubscribe from the service. The company plans to offer an incentive for these customers as the cost of churn is far greater than the cost of the incentive.

The model produces the following confusion matrix after evaluating on a test dataset of 100 customers: Based on the model evaluation results, why is this a viable model for production?

| n = 100 | PREDICTED CHURN | |
|------------------|-----------------|----|
| | Yes | No |
| ACTUAL Churn Yes | 10 | 4 |
| Actual No | 10 | 76 |

- A. The model is 86% accurate and the cost incurred by the company as a result of false negatives is less than the false positives.
- B. The precision of the model is 86%, which is less than the accuracy of the model.
- C. The model is 86% accurate and the cost incurred by the company as a result of false positives is less than the false negatives.
- D. The precision of the model is 86%, which is greater than the accuracy of the model.

Answer: B

NEW QUESTION 29

A Machine Learning Specialist is packaging a custom ResNet model into a Docker container so the company can leverage Amazon SageMaker for training. The Specialist is using Amazon EC2 P3 instances to train the model and needs to properly configure the Docker container to leverage the NVIDIA GPUs. What does the Specialist need to do?

- A. Bundle the NVIDIA drivers with the Docker image
- B. Build the Docker container to be NVIDIA-Docker compatible
- C. Organize the Docker container's file structure to execute on GPU instances.
- D. Set the GPU flag in the Amazon SageMaker Create TrainingJob request body

Answer: A

NEW QUESTION 30

A Machine Learning Specialist is using Apache Spark for pre-processing training data. As part of the Spark pipeline, the Specialist wants to use Amazon SageMaker for training a model and hosting it. Which of the following would the Specialist do to integrate the Spark application with SageMaker? (Select THREE)

- A. Download the AWS SDK for the Spark environment
- B. Install the SageMaker Spark library in the Spark environment.
- C. Use the appropriate estimator from the SageMaker Spark Library to train a model.
- D. Compress the training data into a ZIP file and upload it to a pre-defined Amazon S3 bucket.
- E. Use the `sageMakerMode`
- F. transform method to get inferences from the model hosted in SageMaker
- G. Convert the DataFrame object to a CSV file, and use the CSV file as input for obtaining inferences from SageMaker.

Answer: DEF

NEW QUESTION 31

A Machine Learning Specialist is building a logistic regression model that will predict whether or not a person will order a pizza. The Specialist is trying to build the optimal model with an ideal classification threshold.

What model evaluation technique should the Specialist use to understand how different classification thresholds will impact the model's performance?

- A. Receiver operating characteristic (ROC) curve
- B. Misclassification rate
- C. Root Mean Square Error (RMSE)
- D. L1 norm

Answer: A

NEW QUESTION 36

A company is running an Amazon SageMaker training job that will access data stored in its Amazon S3 bucket. A compliance policy requires that the data never be transmitted across the internet. How should the company set up the job?

- A. Launch the notebook instances in a public subnet and access the data through the public S3 endpoint
- B. Launch the notebook instances in a private subnet and access the data through a NAT gateway
- C. Launch the notebook instances in a public subnet and access the data through a NAT gateway

D. Launch the notebook instances in a private subnet and access the data through an S3 VPC endpoint.

Answer: D

NEW QUESTION 39

A Machine Learning Specialist is developing a custom video recommendation model for an application. The dataset used to train this model is very large with millions of data points and is hosted in an Amazon S3 bucket. The Specialist wants to avoid loading all of this data onto an Amazon SageMaker notebook instance because it would take hours to move and will exceed the attached 5 GB Amazon EBS volume on the notebook instance. Which approach allows the Specialist to use all the data to train the model?

- A. Load a smaller subset of the data into the SageMaker notebook and train locally
- B. Confirm that the training code is executing and the model parameters seem reasonable
- C. Initiate a SageMaker training job using the full dataset from the S3 bucket using Pipe input mode.
- D. Launch an Amazon EC2 instance with an AWS Deep Learning AMI and attach the S3 bucket to the instance
- E. Train on a small amount of the data to verify the training code and hyperparameter
- F. Go back to Amazon SageMaker and train using the full dataset
- G. Use AWS Glue to train a model using a small subset of the data to confirm that the data will be compatible with Amazon SageMaker
- H. Initiate a SageMaker training job using the full dataset from the S3 bucket using Pipe input mode.
- I. Load a smaller subset of the data into the SageMaker notebook and train locally
- J. Confirm that the training code is executing and the model parameters seem reasonable
- K. Launch an Amazon EC2 instance with an AWS Deep Learning AMI and attach the S3 bucket to train the full dataset.

Answer: A

NEW QUESTION 42

A Machine Learning Specialist has completed a proof of concept for a company using a small data sample and now the Specialist is ready to implement an end-to-end solution in AWS using Amazon SageMaker. The historical training data is stored in Amazon RDS. Which approach should the Specialist use for training a model using that data?

- A. Write a direct connection to the SQL database within the notebook and pull data in
- B. Push the data from Microsoft SQL Server to Amazon S3 using an AWS Data Pipeline and provide the S3 location within the notebook.
- C. Move the data to Amazon DynamoDB and set up a connection to DynamoDB within the notebook to pull data in
- D. Move the data to Amazon ElastiCache using AWS DMS and set up a connection within the notebook to pull data in for fast access.

Answer: B

NEW QUESTION 43

A Machine Learning Specialist is building a prediction model for a large number of features using linear models, such as linear regression and logistic regression. During exploratory data analysis, the Specialist observes that many features are highly correlated with each other. This may make the model unstable. What should be done to reduce the impact of having such a large number of features?

- A. Perform one-hot encoding on highly correlated features
- B. Use matrix multiplication on highly correlated features.
- C. Create a new feature space using principal component analysis (PCA)
- D. Apply the Pearson correlation coefficient

Answer: C

NEW QUESTION 48

A Machine Learning Specialist is developing a daily ETL workflow containing multiple ETL jobs. The workflow consists of the following processes:

- * Start the workflow as soon as data is uploaded to Amazon S3
- * When all the datasets are available in Amazon S3, start an ETL job to join the uploaded datasets with multiple terabyte-sized datasets already stored in Amazon S3
- * Store the results of joining datasets in Amazon S3
- * If one of the jobs fails, send a notification to the Administrator. Which configuration will meet these requirements?

- A. Use AWS Lambda to trigger an AWS Step Functions workflow to wait for dataset uploads to complete in Amazon S3. Use AWS Glue to join the datasets. Use an Amazon CloudWatch alarm to send an SNS notification to the Administrator in the case of a failure.
- B. Develop the ETL workflow using AWS Lambda to start an Amazon SageMaker notebook instance. Use a lifecycle configuration script to join the datasets and persist the results in Amazon S3. Use an Amazon CloudWatch alarm to send an SNS notification to the Administrator in the case of a failure.
- C. Develop the ETL workflow using AWS Batch to trigger the start of ETL jobs when data is uploaded to Amazon S3. Use AWS Glue to join the datasets in Amazon S3. Use an Amazon CloudWatch alarm to send an SNS notification to the Administrator in the case of a failure.
- D. Use AWS Lambda to chain other Lambda functions to read and join the datasets in Amazon S3 as soon as the data is uploaded to Amazon S3. Use an Amazon CloudWatch alarm to send an SNS notification to the Administrator in the case of a failure.

Answer: A

NEW QUESTION 53

Amazon Connect has recently been tolled out across a company as a contact call center. The solution has been configured to store voice call recordings on Amazon S3.

The content of the voice calls are being analyzed for the incidents being discussed by the call operators. Amazon Transcribe is being used to convert the audio to text, and the output is stored on Amazon S3.

Which approach will provide the information required for further analysis?

- A. Use Amazon Comprehend with the transcribed files to build the key topics
- B. Use Amazon Translate with the transcribed files to train and build a model for the key topics
- C. Use the AWS Deep Learning AMI with Gluon Semantic Segmentation on the transcribed files to train and build a model for the key topics
- D. Use the Amazon SageMaker k-Nearest-Neighbors (kNN) algorithm on the transcribed files to generate a word embeddings dictionary for the key topics

Answer: B

NEW QUESTION 56

A Data Scientist is working on an application that performs sentiment analysis. The validation accuracy is poor and the Data Scientist thinks that the cause may be a rich vocabulary and a low average frequency of words in the dataset. Which tool should be used to improve the validation accuracy?

- A. Amazon Comprehend syntax analysts and entity detection
- B. Amazon SageMaker BlazingText allow mode
- C. Natural Language Toolkit (NLTK) stemming and stop word removal
- D. Scikit-learn term frequency-inverse document frequency (TF-IDF) vectorizers

Answer: D

NEW QUESTION 58

A financial services company is building a robust serverless data lake on Amazon S3. The data lake should be flexible and meet the following requirements:

- * Support querying old and new data on Amazon S3 through Amazon Athena and Amazon Redshift Spectrum.
- * Support event-driven ETL pipelines.
- * Provide a quick and easy way to understand metadata. Which approach meets these requirements?

- A. Use an AWS Glue crawler to crawl S3 data, an AWS Lambda function to trigger an AWS Glue ETL job, and an AWS Glue Data catalog to search and discover metadata.
- B. Use an AWS Glue crawler to crawl S3 data, an AWS Lambda function to trigger an AWS Batch job, and an external Apache Hive metastore to search and discover metadata.
- C. Use an AWS Glue crawler to crawl S3 data, an Amazon CloudWatch alarm to trigger an AWS Batch job, and an AWS Glue Data Catalog to search and discover metadata.
- D. Use an AWS Glue crawler to crawl S3 data, an Amazon CloudWatch alarm to trigger an AWS Glue ETL job, and an external Apache Hive metastore to search and discover metadata.

Answer: B

NEW QUESTION 61

A Machine Learning Specialist is working with a media company to perform classification on popular articles from the company's website. The company is using random forests to classify how popular an article will be before it is published. A sample of the data being used is below. Given the dataset, the Specialist wants to convert the Day-Of-Week column to binary values. What technique should be used to convert this column to binary values.

| Article Title | Author | Top Keywords | Day Of Week | URL of Article | Page Views |
|------------------------------------|------------|--|-------------|---|------------|
| Building a Big Data Platform | Jane Doe | Big Data, Spark, Hadoop | Tuesday | http://examplecorp.com/data_platform.html | 1300456 |
| Getting Started with Deep Learning | John Doe | Deep Learning, Machine Learning, Spark | Tuesday | http://examplecorp.com/started_deep_learning.html | 1230661 |
| MXNet ML Guide | Jane Doe | Machine Learning, MXNet, Logistic Regression | Thursday | http://examplecorp.com/mxnet_guide.html | 937291 |
| Intro to NoSQL Databases | Mary Major | NoSQL, Operations, Database | Monday | http://examplecorp.com/nosql_intro_guide.html | 407812 |

- A. Binarization
- B. One-hot encoding
- C. Tokenization
- D. Normalization transformation

Answer: B

NEW QUESTION 65

A Data Scientist needs to create a serverless ingestion and analytics solution for high-velocity, real-time streaming data. The ingestion process must buffer and convert incoming records from JSON to a query-optimized, columnar format without data loss. The output datastore must be highly available, and Analysts must be able to run SQL queries against the data and connect to existing business intelligence dashboards. Which solution should the Data Scientist build to satisfy the requirements?

- A. Create a schema in the AWS Glue Data Catalog of the incoming data format
- B. Use an Amazon Kinesis Data Firehose delivery stream to stream the data and transform the data to Apache Parquet or ORC format using the AWS Glue Data Catalog before delivering to Amazon S3. Have the Analysts query the data directly from Amazon S3 using Amazon Athena, and connect to BI tools using the Athena Java Database Connectivity (JDBC) connector.
- C. Write each JSON record to a staging location in Amazon S3. Use the S3 Put event to trigger an AWS Lambda function that transforms the data into Apache Parquet or ORC format and writes the data to a processed data location in Amazon S3. Have the Analysts query the data directly from Amazon S3 using Amazon Athena, and connect to BI tools using the Athena Java Database Connectivity (JDBC) connector.
- D. Write each JSON record to a staging location in Amazon S3. Use the S3 Put event to trigger an AWS Lambda function that transforms the data into Apache Parquet or ORC format and inserts it into an Amazon RDS PostgreSQL database.
- E. Have the Analysts query and run dashboards from the RDS database.
- F. Use Amazon Kinesis Data Analytics to ingest the streaming data and perform real-time SQL queries to convert the records to Apache Parquet before delivering

to Amazon S3. Have the Analysts query the data directly from Amazon S3 using Amazon Athena and connect to BI tools using the Athena Java Database Connectivity (JDBC) connector.

Answer: A

NEW QUESTION 69

A Machine Learning Specialist needs to create a data repository to hold a large amount of time-based training data for a new model. In the source system, new files are added every hour. Throughout a single 24-hour period, the volume of hourly updates will change significantly. The Specialist always wants to train on the last 24 hours of the data.

Which type of data repository is the MOST cost-effective solution?

- A. An Amazon EBS-backed Amazon EC2 instance with hourly directories
- B. An Amazon RDS database with hourly table partitions
- C. An Amazon S3 data lake with hourly object prefixes
- D. An Amazon EMR cluster with hourly hive partitions on Amazon EBS volumes

Answer: C

NEW QUESTION 73

A bank's Machine Learning team is developing an approach for credit card fraud detection. The company has a large dataset of historical data labeled as fraudulent. The goal is to build a model to take the information from new transactions and predict whether each transaction is fraudulent or not.

Which built-in Amazon SageMaker machine learning algorithm should be used for modeling this problem?

- A. Seq2seq
- B. XGBoost
- C. K-means
- D. Random Cut Forest (RCF)

Answer: C

NEW QUESTION 77

A Data Scientist is developing a machine learning model to predict future patient outcomes based on information collected about each patient and their treatment plans. The model should output a continuous value as its prediction. The data available includes labeled outcomes for a set of 4,000 patients. The study was conducted on a group of individuals over the age of 65 who have a particular disease that is known to worsen with age.

Initial models have performed poorly. While reviewing the underlying data, the Data Scientist notices that, out of 4,000 patient observations, there are 450 where the patient age has been input as 0. The other features for these observations appear normal compared to the rest of the sample population. How should the Data Scientist correct this issue?

- A. Drop all records from the dataset where age has been set to 0.
- B. Replace the age field value for records with a value of 0 with the mean or median value from the dataset.
- C. Drop the age feature from the dataset and train the model using the rest of the features.
- D. Use k-means clustering to handle missing features.

Answer: A

NEW QUESTION 78

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