

## ***1. What is Machine learning?***

This is often the foundation for an AI system, and is the way we "teach" a computer model to make prediction and draw conclusions from data. Machine learning is a technique that uses mathematics and statistics to create a model that can predict unknown values.

## ***2. What is Anomaly detection?***

The capability to automatically detect errors or unusual activity in a system.

## ***3. What is Computer Vision?***

The capability of software to interpret the world visually through cameras, video, and images.

## ***4. What is Natural language processing?***

The capability for a computer to interpret written or spoken language, and respond in kind.

## ***5. What is Conversational AI?***

The capability of a software "agent" to participate in a conversation.

## ***6. What is AI?***

AI is the creation of software that imitates human behaviors and capabilities. Key elements include: Machine learning  
Anomaly detection  
Computer Vision  
Natural language processing  
Conversational AI

## ***7. How do machines learn?***

In today's world, we create huge volumes of data as we go about our everyday lives. From the text messages, emails, and social media posts we send to the photographs and videos we take on our phones, we generate massive amounts of information. More data still is

created by millions of sensors in our homes, cars, cities, public transport infrastructure, and factories. Data scientists can use all of that data to train machine learning models that can make predictions and inferences based on the relationships they find in the data. <https://docs.microsoft.com/en-us/learn/modules/get-started-ai-fundamentals/2-understand-machine-learn>

## ***8. Is there any service for Machine learning from Microsoft Azure?***

Yes Microsoft Azure provides the **Azure Machine Learning** service - a cloud-based platform for creating, managing, and publishing machine learning models.

## ***9. What are the features and capabilities of Azure Machine Learning Service?***

### **Automated machine learning**

This feature enables non-experts to quickly create an effective machine learning model from data. **Azure Machine Learning designer**

A graphical interface enabling no-code development of machine learning solutions. **Data and compute management**

Cloud-based data storage and compute resources that professional data scientists can use to run data experiment code at scale. **Pipelines**

Data scientists, software engineers, and IT operations professionals can define pipelines to orchestrate model training, deployment, and management tasks.

## ***10. In which scenarios you use anomaly detection — a machine learning-based technique that analyzes data over time and identifies unusual changes?***

1. Monitor credit card transactions and detect unusual usage patterns that might indicate fraud.
2. An application that tracks activity in an automated production line and identifies failures.
3. A racing car telemetry system that uses sensors to proactively warn engineers about potential mechanical failures before they happen.

## ***11. Is there any service for Anomaly detection from Microsoft Azure?***

The **Anomaly Detector** service provides an application programming interface (API) that developers can use to create anomaly detection solutions. To learn more, view the [Anomaly Detector service web site](#).

## ***12. Name the app based on Computer Vision?***

The **Seeing AI** app is a great example of the power of computer vision. Designed for the blind and low vision community, the Seeing AI app harnesses the power of AI to open up the visual world and describe nearby people, text and objects.

## ***13. What are the tasks that come under Computer Vision?***

### **Image classification**

Image classification involves training a machine learning model to classify images based on their contents. For example, in a traffic monitoring solution you might use an image classification model to classify images based on the type of vehicle they contain, such as taxis, buses, cyclists, and so on.

### **Object detection**

Object detection machine learning models are trained to classify individual objects within an image, and identify their location with a bounding box. For example, a traffic monitoring solution might use object detection to identify the location of different classes of vehicle.

### **Semantic segmentation**

Semantic segmentation is an advanced machine learning technique in which individual pixels in the image are classified according to the object to which they belong. For example, a traffic monitoring solution might overlay traffic images with "mask" layers to highlight different vehicles using specific colors.

### **Image analysis**

You can create solutions that combine machine learning models with advanced image analysis techniques to extract information from images, including "tags" that could help catalog the image or even descriptive captions that summarize the scene shown in the image.

### **Face detection, analysis, and recognition**

Face detection is a specialized form of object detection that locates human faces in an image. This can be combined with classification and facial geometry analysis techniques to infer details such as gender, age, and emotional state; and even recognize individuals based on their facial features.

### **Optical character recognition (OCR)**

Optical character recognition is a technique used to detect and read text in images. You can use OCR to read text in photographs (for example, road signs or store fronts) or to extract information from scanned documents such as letters, invoices, or forms.

## ***14. What are the Computer Vision services in Microsoft Azure?***

### **Computer Vision**

You can use this service to analyze images and video, and extract descriptions, tags, objects, and text.

### **Custom Vision**

Use this service to train custom image classification and object detection models using your own images.

### **Face**

The Face service enables you to build face detection and facial recognition solutions.

### **Form Recognizer**

Use this service to extract information from scanned forms and invoices.

## ***15. What can you do with NLP?***

\* Analyze and interpret text in documents, email messages, and other sources.  
\* Interpret spoken language, and synthesize speech responses.  
\* Automatically translate spoken or written phrases between languages.  
\* Interpret commands and determine appropriate actions.

## ***16. What are NLP services in Microsoft Azure?***

### **Text Analytics**

Use this service to analyze text documents and extract key phrases, detect entities (such as places, dates, and people), and evaluate sentiment (how positive or negative a document is).

### **Translator Text**

Use this service to translate text between more than 60 languages.

### **Speech**

Use this service to recognize and synthesize speech, and to translate spoken languages.

### **Language Understanding Intelligent Service (LUIS)**

Use this service to train a language model that can understand spoken or text-based commands.

## ***17. What are the Conversational AI services in Microsoft Azure?***

### **QnA Maker**

This cognitive service enables you to quickly build a *knowledge base* of questions and answers that can form the basis of a dialog between a human and an AI agent.

### **Azure Bot Service**

This service provides a platform for creating, publishing, and managing bots. Developers can use the *Bot Framework* to create a bot and manage it with Azure Bot Service - integrating back-end services like QnA Maker and LUIS, and connecting to channels for web chat, email, Microsoft Teams, and others.

## ***18. What is responsible AI?***

Artificial Intelligence is a powerful tool that can be used to greatly benefit the world. However, like any tool, it must be used responsibly. At Microsoft, AI software development is guided by a set of six principles, designed to ensure that AI applications provide amazing solutions to difficult problems without any unintended negative consequences.

## ***19. What are the six guiding principles of responsible AI?***

### **Fairness**

AI systems should treat all people fairly. For example, suppose you create a machine learning model to support a loan approval application for a bank. The model should make predictions of whether or not the loan should be approved without incorporating any bias based on gender, ethnicity, or other factors that might result in an unfair advantage or disadvantage to specific groups of applicants.

### **Reliability and safety**

AI systems should perform reliably and safely. For example, consider an AI-based software system for an autonomous vehicle; or a machine learning model that diagnoses patient symptoms and recommends prescriptions. Unreliability in these kinds of system can result in substantial risk to human life.

### **Privacy and security**

AI systems should be secure and respect privacy. The machine learning models on which AI systems are based rely on large volumes of data, which may contain personal details that must be kept private. Even after the models are trained and the system is in production, it uses new data to make predictions or take action that may be subject to privacy or security concerns.

### **Inclusiveness**

AI systems should empower everyone and engage people. AI should bring benefits to all parts of society, regardless of physical ability, gender, sexual orientation, ethnicity, or other factors.

### **Transparency**

AI systems should be understandable. Users should be made fully aware of the purpose of the system, how it works, and what limitations may be expected.**Accountability**  
People should be accountable for AI systems. Designers and developers of AI-based solution should work within a framework of governance and organizational principles that ensure the solution meets ethical and legal standards that are clearly defined.

***20. You want to create a model to predict sales of ice cream based on historic data that includes daily ice cream sales totals and weather measurements. Which Azure service should you use?***

Azure Machine Learning

***21. You want to train a model that classifies images of dogs and cats based on a collection of your own digital photographs. Which Azure service should you use?***

Computer Vision

***22. You are designing an AI application that uses computer vision to detect cracks in car windshields, and warns drivers when a windshield should be repaired or replaced. When tested in good lighting conditions, the application successfully detects 99% of dangerously damaged glass. Which of the following statements should you include in the application's user interface?***

When used in good lighting conditions, this application can be used to identify potentially dangerous cracks and defects in windshields. If you suspect your windshield is damaged, even if the application does not detect any defects, you should have it inspected by a professional.

**23. You create a machine learning model to support a loan approval application for a bank. The model should make predictions of whether or not the loan should be approved without incorporating any bias based on gender, ethnicity, or other factors that might result in an unfair advantage or disadvantage to specific groups of applicants. Which principle of responsible AI does this come under?**

Fairness

**24. AI-based software application development must be subjected to rigorous testing and deployment management processes to ensure that they work as expected before release. Which principle of responsible AI does this come under?**

Reliability and safety

**25. The machine learning models on which AI systems are based rely on large volumes of data, which may contain personal details that must be kept private. Which principle of responsible AI does this come under?**

Privacy and security

**26. AI systems should empower everyone and engage people. AI should bring benefits to all parts of society, regardless of physical ability, gender, sexual orientation, ethnicity, or other factors. Which principle of responsible AI does this come under?**

***27. AI systems should be understandable. Users should be made fully aware of the purpose of the system, how it works, and what limitations may be expected. Which principle of responsible AI does this come under?***

Transparency

***28. Designers and developers of AI-based solutions should work within a framework of governance and organizational principles that ensure the solution meets ethical and legal standards that are clearly defined. Which principle of responsible AI does this come under?***

Accountability

Describe fundamental principles of machine learning on Azure (30- 35%)

Practice questions based on these concepts

- Identify common machine learning types
- Describe core machine learning concepts
- Identify core tasks in creating a machine learning solution
- Describe the capabilities of no-code machine learning with Azure Machine Learning



**29. Adventure Works Cycles is a business that rents cycles in a city. The business could use historic data to train a model that predicts daily rental demand in order to make sure sufficient staff and cycles are available. Which service should you use?**

Azure Machine Learning

**30. What are the various kinds of machine learning models?**

**Regression (supervised machine learning)**

We use historic data to train the model to predict the numerical value

**Classification (supervised machine learning)**

We can fit the features into the model and predict the classification of the label

**Unsupervised Machine learning**

You don't have a label to predict. you only have features. You have to create clusters based on the features.

**31. What is the process of machine learning regardless of the model?**

**Data Ingestion**

You need to get the data to train your model

**Data Pre processing**

Identify the features that helps the model to predict and

discarding others

**Data Cleaning**

Fix any errors or removing the items which has errors

**Replacing Feature Values**

find the replacement feature values if any missing. In this process

you might use existing feature engineering to find the value

**Apply Algorithms**

Apply algorithms on this data for the processing until you are

happy with the model predictions

**Deploy Model**

Finally you deploy your model into machine learning service so that applications can connect to it.

**32. To use Azure Machine Learning, you create a workspace in your Azure subscription. Is this true?**

TrueYou can then use this workspace to manage data, compute resources, code, models, and other artifacts related to your machine learning workloads.

### ***33. What is the benefit of using the Azure Machine learning service?***

Data scientists expend a lot of effort exploring and pre-processing data, and trying various types of model-training algorithm to produce accurate models, which is time consuming, and often makes inefficient use of expensive compute hardware. Azure Machine Learning is a cloud-based platform for building and operating machine learning solutions in Azure. It includes a wide range of features and capabilities that help data scientists prepare data, train models, publish predictive services, and monitor their usage. **Most importantly, it helps data scientists increase their efficiency by automating many of the time-consuming tasks associated with training models;** and it enables them to use cloud-based compute resources that scale effectively to handle large volumes of data while incurring costs only when actually used.

### ***34. What are the settings you need when creating a Machine learning workspace?***

**Workspace Name:** A unique name of your choice  
**Subscription:** Your Azure subscription  
**Resource group:** Create a new resource group with a unique name  
**Location:** Choose any available location  
**Workspace edition:** Enterprise

### ***35. How many kinds of workspace editions?***

Basic  
Enterprise

### ***36. Automated machine learning interface available only in Enterprise edition. Is this true?***

True

### ***37. What are other resources that are added automatically when creating Machine Learning Workspace?***

Azure Storage  
Azure Application insights  
Azure Key Vault

### ***38. What is Machine Learning Studio?***

You can manage your workspace using the Azure portal, but for data scientists and Machine Learning operations engineers, Azure Machine Learning studio provides a more focused user interface for managing workspace resources. On the **Overview** page for your workspace, launch Azure Machine Learning studio (or open a new browser tab and navigate to <https://ml.azure.com>), and sign into Azure Machine Learning studio using your Microsoft account.

### ***39. How many kinds of Compute resources that data scientists can use to train their models?***

#### **Compute Instances**

Development workstations that data scientists can use to work with data and models. **Compute Clusters:**

Scalable clusters of virtual machines for on-demand processing of experiment code. **Inference Clusters:**

Deployment targets for predictive services that use your trained models. **Attached Compute:**

Links to existing Azure compute resources, such as Virtual Machines or Azure Databricks clusters.

### ***40. What are the settings you need to create a compute instance?***

**Compute name:** enter a unique name **Virtual Machine type:** CPU **Virtual Machine size:** Standard\_DS2\_v2

### ***41. What are the settings you need to create a Compute Clusters?***

Compute name: enter a unique nameVirtual Machine size:  
Standard\_DS2\_v2Virtual Machine priority: DedicatedMinimum number of  
nodes: 2Maximum number of nodes: 2Idle seconds before scale down:  
120

***42. How do you make sure that to start the compute only when it is needed when creating computer clusters in the production environment?***

In a production environment, you'd typically set the **minimum number of nodes** value to 0 so that compute is only started when it is needed.

***43. How do you reduce the amount of time you spend waiting for the compute to start?***

To reduce the amount of time you spend waiting for it you've initialized it with two permanently running nodes.

***44. In the Machine Learning Studio, where do you register the data to train the model?***

Assets > Datasets

***45. How many ways you can import data for creating datasets?***

From Local files  
From datastore  
From web files  
From open datasets

***46. You have created a dataset and you want to see the ample of the data. Where do you see in the Machine Learning Studio?***

After the dataset has been created, open it and view the **Explore** page to see a sample of the data.

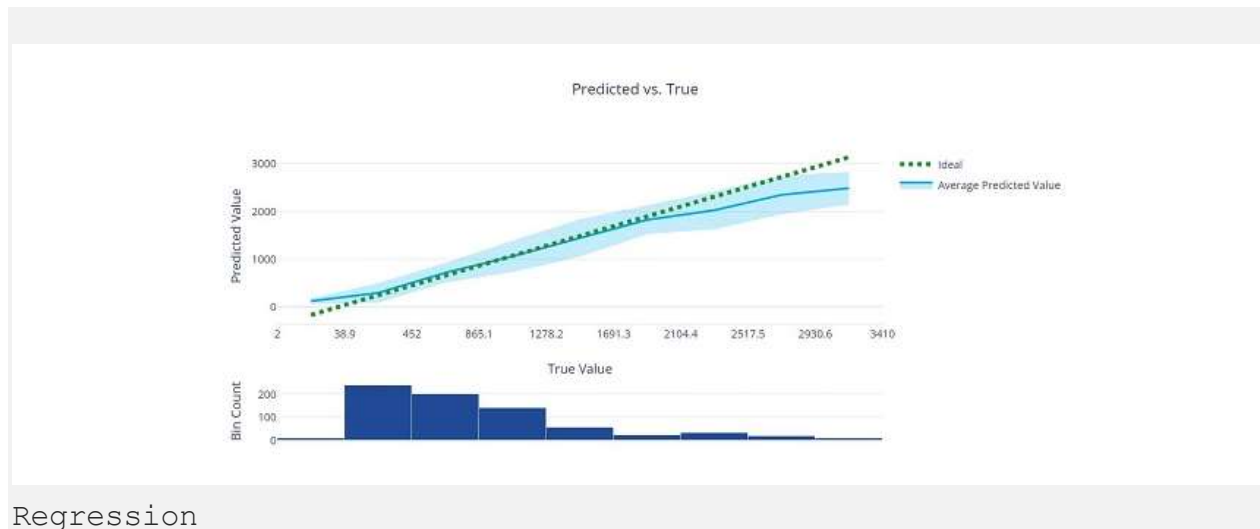
#### **47. Where do you run experiments in ML Studio?**

Author > Automated ML page  
Create a new Automated ML run  
select dataset  
Configure run  
Task type and settings

#### **48. \_\_\_\_\_ model to predict the numeric value. Fill this blank?**

Regression

#### **49. Which kind of model to produce the Predicted vs True chart?**



Regression

#### **49. An automobile dealership wants to use historic car sales data to train a machine learning model. The model should predict the price of a pre-owned car based on characteristics like its age, engine size, and mileage. What kind of machine learning model does the dealership need to create?**

Regression

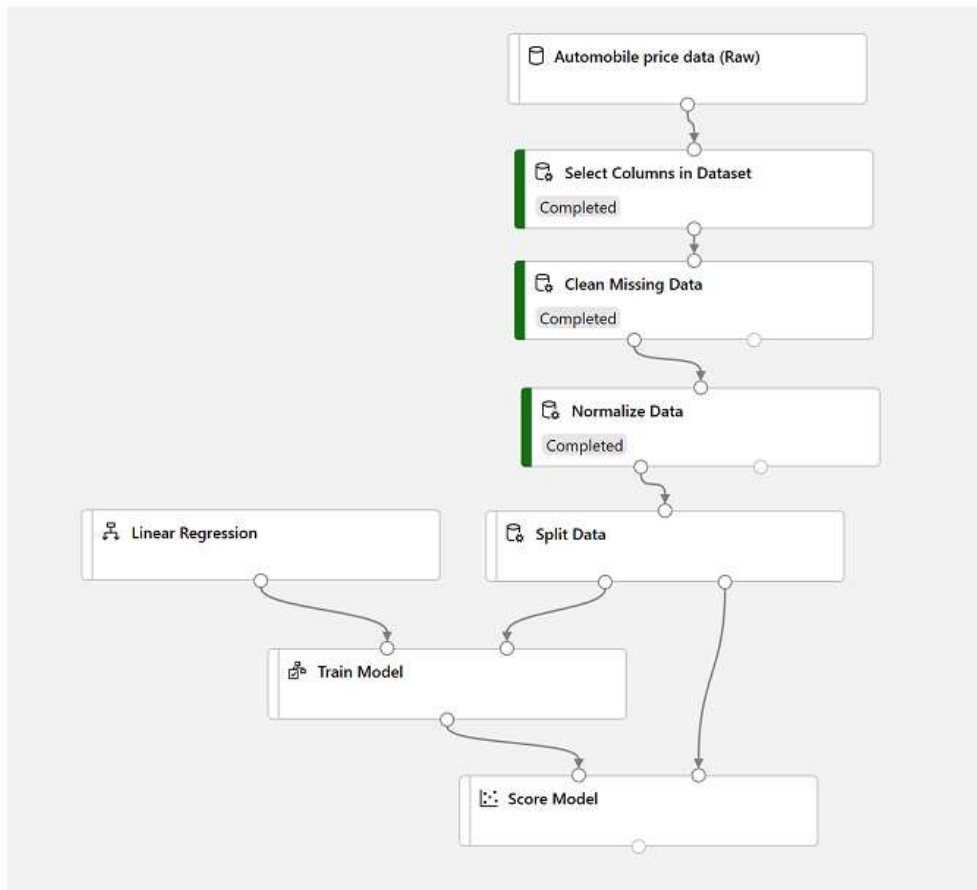
**50. A bank wants to use historic loan repayment records to categorize loan applications as low-risk or high-risk based on characteristics like the loan amount, the income of the borrower, and the loan period. What kind of machine learning model does the bank need to create?**

Classification

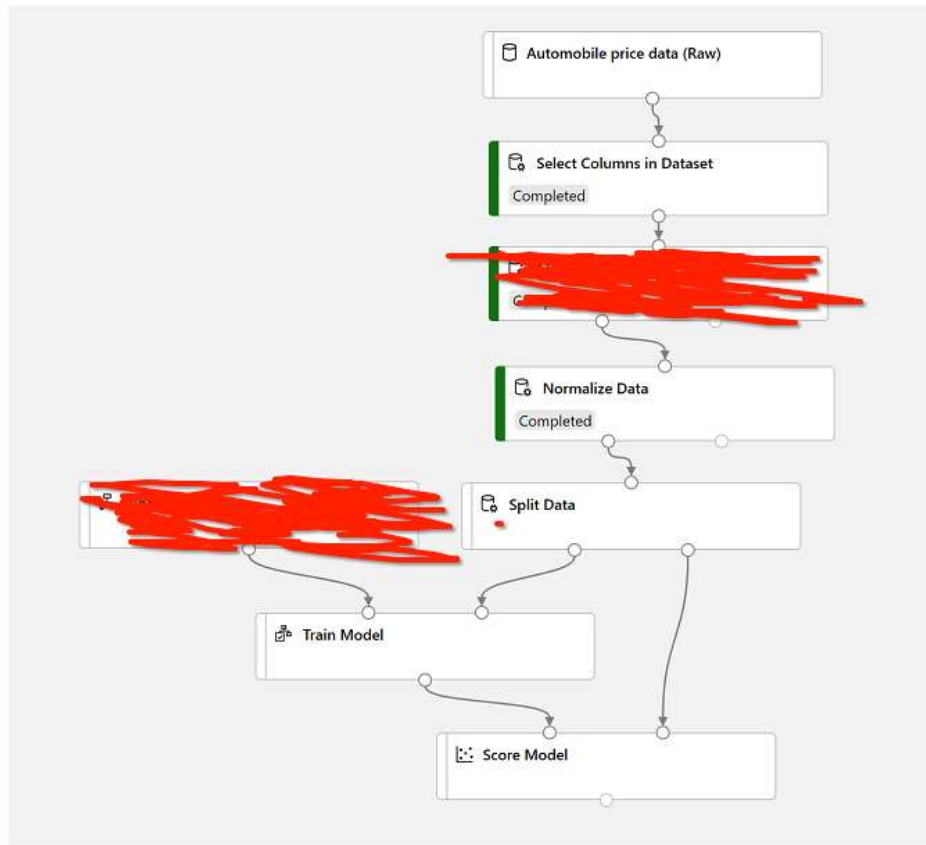
**50. Which of the following types of machine learning is an example of unsupervised machine learning?**

Clustering

**51. You are creating a model with the Azure Machine Learning designer. As a first step, you import the raw data. What are the next steps you need to do to prepare the data for the modeling?**



**52. You have created model with Azure Machine Learning designer using linear regression. What are the missing steps in the below diagram?**



Clean Missing Data  
Linear Regression

### ***53. What is Mean Absolute Error (MAE)?***

The average difference between predicted values and true values. This value is based on the same units as the label, in this case dollars. The lower this value is, the better the model is predicting.

### ***54. What is Root Mean Squared Error (RMSE)?***

The mean difference between predicted and true values is squared, and then the square root is calculated. The result is a metric based on the same unit as the label (dollars). When compared to the MAE (above), a larger difference indicates greater variance in the individual errors (for example, with some errors being very small, while others are large). If the MAE and RMSE are approximately the same, then all individual errors are of a similar magnitude.



### ***55. What is Relative Squared Error (RSE)?***

A relative metric between 0 and 1 based on the square of the differences between predicted and true values. The closer to 0 this metric is, the better the model is performing. Because this metric is relative, it can be used to compare models where the labels are in different units.

### ***56. What is Relative Absolute Error (RAE)?***

A relative metric between 0 and 1 based on the absolute differences between predicted and true values. The closer to 0 this metric is, the better the model is performing. Like RSE, this metric can be used to compare models where the labels are in different units.

### ***57. What is the Coefficient of Determination (R<sup>2</sup>)?***

This metric is more commonly referred to as *R-Squared*, and summarizes how much of the variance between predicted and true values is explained by the model. The closer to 1 this value is, the better the model is performing.

### ***58. You plan to use the Azure Machine Learning designer to create and publish a regression model. Which edition should you choose when creating an Azure Machine Learning workspace?***

Enterprise

### ***59. You are creating a training pipeline for a regression model, using a dataset that has multiple numeric columns in which the values are on different scales. You want to transform the numeric columns so that the values are all on a similar scale based relative to the minimum and maximum values in each column. Which module should you add to the pipeline?***

Normalize Data

**60. You use the Azure Machine Learning designer to create a training pipeline and an inference pipeline for a regression model. Now you plan to deploy the inference pipeline as a real-time service. What kind of compute target should you create to host the service?**

Inference Cluster

**61. \_\_\_\_\_ is a form of machine learning that is used to predict which category, or class, an item belongs to.**

Classification

**62. A health clinic might use the characteristics of a patient (such as age, weight, blood pressure, and so on) to predict whether the patient is at risk of diabetes. In this case, the characteristics of the patient are the features, and the label is a classification of either 0 or 1, representing non-diabetic or diabetic. What kind of model is this?**

Classification

**63. You are using the Azure Machine Learning designer to create a training pipeline for a binary classification model. You have added a dataset containing features and labels, a Two-Class Decision Forest module, and a Train Model module. You plan to use Score Model and Evaluate Model modules to test the trained model with a subset of the dataset that was not used for training. Which additional kind of module should you add?**

**64. You use an Azure Machine Learning designer pipeline to train and test a binary classification model. You review the model's performance metrics in an Evaluate Model module and note that it has an AUC score of 0.3. What can you conclude about the model?**

The model performs worse than random guessing.

**65. You use the Azure Machine Learning designer to create a training pipeline for a classification model. What must you do before deploying the model as a service?**

Create an inference pipeline from the training pipeline

**66. What is the Accuracy metric in the classification model?**

The ratio of correct predictions (true positives + true negatives) to the total number of predictions. In other words, what proportion of diabetes predictions did the model get right?

**67. What is called the F1 score metric in the classification model?**

An overall metric that essentially combines precision and recall.

**68. \_\_\_\_\_ is a form of machine learning that is used to group similar items into clusters based on their features?**

Clustering

**69. To train a clustering model, you need to apply a clustering algorithm to the data, using only the features that you have selected for clustering. You'll train the model with a subset of the data, and use the rest to test the trained model. This is the complete pipeline for clustering what are the missing modules in the following pipeline?**



**70. You are using an Azure Machine Learning designer pipeline to train and test a K-Means clustering model.**

***You want your model to assign items to one of three clusters. Which configuration property of the K-Means Clustering module should you set to accomplish this?***

Set Number of Centroids to 3

***71. You use the Azure Machine Learning designer to create a training pipeline for a clustering model. Now you want to use the model in an inference pipeline. Which module should you use to infer cluster predictions from the model?***

Assign Data to Clusters

Describe features of computer vision workloads on Azure (15–20%)

Practice questions based on these concepts

- Identify common types of computer vision solution
- Identify Azure tools and services for computer vision tasks

***72. What can Computer Vision cognitive service do?***

Interpret an image and suggest an appropriate caption. Suggest relevant tags that could be used to index an image. Categorize an image. Identify objects in an image. Detect faces and people in an image. Recognize celebrities and landmarks in an image. Read text in an image.

***73. When using Computer Vision, what is the difference between Computer Vision and Cognitive Services?***

**Computer Vision:** A specific resource for the Computer Vision service. Use this resource type if you don't intend to use any other cognitive services, or if you want to track utilization and costs for your Computer Vision resource separately.**Cognitive Services:** A general cognitive services resource that includes Computer Vision along with many other cognitive services; such as Text Analytics, Translator Text, and others. Use this resource type if you plan to use multiple cognitive services and want to simplify administration and development.

## ***74. If the client wants to use the Computer Vision services what do they need?***

A **key** that is used to authenticate client applications. An **endpoint** that provides the HTTP address at which your resource can be accessed.

## ***75. Can Computer Vision describe the images?***

Yes

## ***76. Computer Vision detects the objects in the image. Is this true?***

TrueThe object detection capability is similar to tagging, in that the service can identify common objects; but rather than tagging, or providing tags for the recognized objects only, this service can also return what is known as bounding box coordinates.

## ***77. Computer Vision detects the brands in the image. Is this true?***

TrueThis feature provides the ability to identify commercial brands. The service has an existing database of thousands of globally recognized logos from commercial brands of products.

## ***78. With Computer Vision you can categorize the people in the image. Is this true?***

True

**79. When categorizing an image, the Computer Vision service supports two specialized domain models. What are these?**

**Celebrities** – The service includes a model that has been trained to identify thousands of well-known celebrities from the worlds of sports, entertainment, and business. **Landmarks** – The service can identify famous landmarks, such as the Taj Mahal and the Statue of Liberty.

**80. The Computer Vision service can use \_\_\_\_\_ capabilities to detect printed and handwritten text in images.**

optical character recognition (OCR)

**81. If you want to detect images that contain adult content or depict violent, gory scenes. Can Computer Vision service help in this scenario?**

YesModerate content – detecting images that contain adult content or depict violent, gory scenes.

**82. You want to use the Computer Vision service to analyze images. You also want to use the Text Analytics service to analyze text. You want developers to require only one key and endpoint to access all of your services. What kind of resource should you create in your Azure subscription?**

Cognitive Services

**83. You want to use the Computer Vision service to identify the location of individual items in an image. Which of the following features should you retrieve?**

Objects

**84. You want to use the Computer Vision service to analyze images of locations and identify well-known buildings? What should you do?**

Retrieve the categories for the image, specifying the landmarks domain

**85. \_\_\_\_\_ is a machine learning technique in which the object being classified is an image, such as a photograph.**

Image classification

**86. What are the uses of Image classification?**

**Product identification** – performing visual searches for specific products in online searches or even, in-store using a mobile device. **Disaster investigation** – evaluating key infrastructure for major disaster preparation efforts. For example, aerial surveillance images may show bridges and classify them as such. Anything classified as a bridge could then be marked for emergency preparation and investigation. **Medical diagnosis** – evaluating images from X-ray or MRI devices could quickly classify specific issues found as cancerous tumors, or many other medical conditions related to medical imaging diagnosis.

**87. What are the resources available for Custom Vision in Azure?**

**Custom Vision:** A dedicated resource for the custom vision service, which can be either a *training* or a *prediction* resource. **Cognitive Services:** A general cognitive services resource that includes Custom Vision along with many other cognitive services. You can use this type of resource for *training*, *prediction*, or both.



**88. The model training process is an iterative process in which the Custom Vision service repeatedly trains the model using some of the data, but holds some back to evaluate the model. What are the evaluation metrics?**

**Precision:** What percentage of the class predictions made by the model were correct? For example, if the model predicted that 10 images are oranges, of which eight were actually oranges, then the precision is 0.8 (80%). **Recall:** What percentage of class predictions did the model correctly identify? For example, if there are 10 images of apples, and the model found 7 of them, then the recall is 0.7 (70%). **Average Precision (AP):** An overall metric that takes into account both precision and recall).

**89. Once you publish the model to your prediction resource. To use your model, what information that client application developers need?**

**Project ID:** The unique ID of the Custom Vision project you created to train the model. **Model name:** The name you assigned to the model during publishing. **Prediction endpoint:** The HTTP address of the endpoints for the *prediction* resource to which you published the model (**not** the training resource). **Prediction key:** The authentication key for the *prediction* resource to which you published the model (**not** the training resource).

**90. You plan to use the Custom Vision service to train an image classification model. You want to create a resource that can only be used for model training, and not for prediction. Which kind of resource should you create in your Azure subscription?**

Custom Vision

**91. You train an image classification model that achieves less than satisfactory evaluation metrics. How might you improve it?**

Add more images to the training set.

**92. You have published an image classification model. What information must you provide to developers who want to use it?**

The project ID, the model name, and the key and endpoint for the prediction resource

**93. \_\_\_\_\_ is a form of machine learning-based computer vision in which a model is trained to recognize individual types of object in an image, and to identify their location in the image.**

Object detection

**94. What information object detection model returns?**

The class of each object identified in the image. The probability score of the object classification (which you can interpret as the confidence of the predicted class being correct) The coordinates of a bounding box for each object.

**95. What is the difference between Object detection and Image classification?**

Image classification is a machine learning based form of computer vision in which a model is trained to categorize images based on the primary subject matter they contain. Object detection goes further than this to classify individual objects within the image, and to return the coordinates of a bounding box that indicates the object's location.

**96. What are the uses of object detection?**

Evaluating the safety of a building by looking for fire extinguishers or other emergency equipment. Creating software for self-driving cars or vehicles with lane assist capabilities. Medical imaging such as an MRI or x-rays that can detect known objects for medical diagnosis.

**97. What are the key considerations when tagging training images for object detection are ensuring that you have sufficient images of the objects?**

Preferably from multiple angles;  
Making sure that the bounding boxes are defined tightly around each object.

**98. Which of the following results does an object detection model typically return for an image?**

A class label, probability, and bounding box for each object in the image

**99. You plan to use a set of images to train an object detection model, and then publish the model as a predictive service. You want to use a single Azure resource with the same key and endpoint for training and prediction. What kind of Azure resource should you create?**

Cognitive Services

**100. \_\_\_\_\_ is an area of artificial intelligence (AI) in which we use algorithms to locate and analyze human faces in images or video content.**

Face detection and analysis

***101. The facial landmarks can be used as features with which to train a machine learning model from which you can infer information about a person, such as their perceived age or perceived emotional state. Is this true?***

True

***102. What are the uses of face detection and analysis?***

Security – facial recognition can be used in building security applications, and increasingly it is used in smartphone operating systems for unlocking devices. Social media – facial recognition can be used to automatically tag known friends in photographs. Intelligent monitoring – for example, an automobile might include a system that monitors the driver's face to determine if the driver is looking at the road, looking at a mobile device, or shows signs of tiredness. Advertising – analyzing faces in an image can help direct advertisements to an appropriate demographic audience. Missing persons – using public cameras systems, facial recognition can be used to identify if a missing person is in the image frame. Identity validation – useful at ports of entry kiosks where a person holds a special entry permit.

***103. What are the cognitive services that you can use to detect and analyze faces from Microsoft Azure?***

**Computer Vision**, which offers face detection and some basic face analysis, such as determining age. **Video Indexer**, which you can use to detect and identify faces in a video. **Face**, which offers pre-built algorithms that can detect, recognize, and analyze faces.

***104. What information client applications need to use face service?***

A **key** that is used to authenticate client applications. An **endpoint** that provides the HTTP address at which your resource can be accessed.

**105. What are some of the tips that can help improve the accuracy of the detection in the images when using Face service?**

**Image format** – supported images are JPEG, PNG, GIF, and BMP  
**file size** – 4 MB or smaller  
**face size range** – from 36 x 36 up to 4096 x 4096. Smaller or larger faces will not be detected  
**other issues** – face detection can be impaired by extreme face angles, occlusion (objects blocking the face such as sunglasses or a hand). Best results are obtained when the faces are full-frontal or as near as possible to full-frontal

**106. You plan to use Face to detect human faces in an image. How does the service indicate the location of the faces it detects?**

A set of coordinates for each face, defining a rectangular bounding box around the face

**107. What is one aspect that may impair facial detection?**

Extreme angles

**108. You want to use Face to identify named individuals. What must you do?**

Use Face to create a group containing multiple images of each named individual, and train a model based on the group

**109. What are the uses of OCR?**

note-taking  
digitizing forms, such as medical records or historical documents  
scanning printed or handwritten checks for bank deposits

**110. The basic foundation of processing printed text is \_\_\_\_\_?**

optical character recognition (OCR)

**111. \_\_\_\_\_ is an AI system not only reads the text characters but can use a semantic model to interpret the text is about.**

`machine reading comprehension (MRC)`

**112. What is OCR API?**

The OCR API is designed for quick extraction of small amounts of text in images. It operates synchronously to provide immediate results, and can recognize text in numerous languages.

**113. What is the information that OCR API returns?**

**Regions** in the image that contain text

**Lines** of text in each region

**Words** in each line of text For each of these elements, the OCR API also returns *bounding box* coordinates that define a rectangle to indicate the location in the image where the region, line, or word appears.

**114. What is the Read API?**

The Read API uses the latest recognition models and is optimized for images that have a significant amount of text or has considerable visual noise.

**115. The Read API is a better option for scanned documents that have a lot of text. Is this true?**

True

**116. What is the information that Read API returns?**

**Pages** – One for each page of text, including information about the page size and orientation.

**Lines** – The lines of text on a page.

**Words** – The words in a line of text. Each line and word includes bounding box coordinates indicating its position on the page.

**117. The OCR API works synchronously and the Read API works asynchronously. Is this correct?**

True

**118. Why the Read API works asynchronously?**

Because the Read API can work with larger documents

**119. You want to extract text from images and then use the Text Analytics service to analyze the text. You want developers to require only one key and endpoint to access all of your services. What kind of resource should you create in your Azure subscription?**

Cognitive Services

**120. You plan to use the Computer Vision service to read the text in a large PDF document. Which API should you use?**

The Read API

**121. The \_\_\_\_\_ in Azure provides intelligent form processing capabilities that you can use to automate the processing of data in documents such as forms, invoices, and receipts.**

Form Recognizer

**122. How many ways Form Recognizer supports automated document processing?**

2 ways  
A pre-built receipt model that is provided out-of-the-box, and is trained to recognize and extract data from sales receipts.  
Custom models, which enable you to extract what are known

as key/value pairs and table data from forms. Custom models are trained using your own data, which helps to tailor this model to your specific forms. Starting with only five samples of your forms, you can train the custom model. After the first training exercise, you can evaluate the results and consider if you need to add more samples and re-train.

**123. Currently, the pre-built receipt model is designed to recognize common receipts, in English, that are common to the USA. Is this true?**

True

**124. What are the guidelines to get the best results when using a custom model?**

Images must be JPEG, PNG, BMP, PDF, or TIFF formats

File size must be less than 20 MB

Image size between 50 x 50 pixels and 10000 x 10000 pixel

For PDF documents, no larger than 17 inches x 17 inches

**125. You plan to use the Form Recognizer pre-built receipt model. Which kind of Azure resource should you create?**

Form Recognizer

**126. You are using the Form Recognizer service to analyze receipts that you have scanned into JPG format images. What is the maximum file size of the JPG file you can submit to the pre-built receipt model?**

20 MB



# Describe features of Natural Language Processing (NLP) workloads on Azure (15–20%)

Practice questions based on these concepts

- Identify features of common NLP Workload Scenarios
- Identify Azure tools and services for NLP workloads

## ***127. What is Text Analytics?***

Text analytics is a process where an artificial intelligence (AI) algorithm, running on a computer, evaluates these same attributes in text, to determine specific insights.

## ***128. You need to use a service from Azure that determines the language of a document or text (for example, French or English). Which one should you use?***

**Text Analytics** cognitive service

## ***129. You need to use a service from Azure that performs sentiment analysis on text to determine a positive or negative sentiment. Which one should you use?***

**Text Analytics** cognitive service

**130. You need to use a service from Azure that extracts key phrases from the text that might indicate its main talking points. Which one should you use?**

**Text Analytics** cognitive service

**131. You need to use a service from Azure Identify and categorize entities in the text. Entities can be people, places, organizations, or even everyday items such as dates, times, quantities, and so on. Which one should you use?**

**Text Analytics** cognitive service

**132. You are planning to read text information only. Which resource you should provision?**

A **Text Analytics** resource - choose this resource type if you only plan to use the Text Analytics service, or if you want to manage access and billing for the resource separately from other services.

**133. You are planning to read text information and objects in the Image. Which resource you should provision?**

A **Cognitive Services** resource - choose this resource type if you plan to use the Text Analytics service in combination with other cognitive services, and you want to manage access and billing for these services together.

**134. The Text Analytics service has language detection capability and you can submit multiple documents at a time for analysis. Is this true?**

True



Document	Language Name	ISO 6391 Code	Score
Review 1	English	en	1.0
Review 2	Spanish	es	1.0
Review 3	English	en	0.9

What does the information in the above table mean?

**Review 1:** It detected English with 1.0 confidence

**Review 2:** It detected Spanish with 1.0 confidence

**Review 3:** The language detection service will focus on the **predominant** language in the text. The service uses an algorithm to determine the predominant language, such as length of phrases or total amount of text for the language compared to other languages in the text. The predominant language will be the value returned, along with the language code. The confidence score may be less than 1 as a result of the mixed language text.

**137. When the text in the document is ambiguous or mixed language content. What is the output of the Text Analytics service?**

An ambiguous content example would be a case where the document contains limited text, or only punctuation. For example, using the service to analyze the text ":-)", results in a value of **unknown** for the language name and the language identifier, and a score of **NaN** (which is used to indicate *not a number*).

**138. What does the confidence score of NaN Text Analytics service output mean?**

Ambiguous or mixed language content

**139. What is the Sentiment Analysis?**

The **Text Analytics service** can evaluate text and return sentiment scores and labels for each sentence. This capability is useful for detecting positive and negative sentiment in social media, customer reviews, discussion forums and more.

***140. What are the score ranges of Sentiment Analysis from the Text Analytics service?***

Using the pre-built machine learning classification model, the service evaluates the text and returns a sentiment score in the range of 0 to 1, with values closer to 1 being a positive sentiment. Scores that are close to the middle of the range (0.5) are considered neutral or indeterminate.

***141. What does the sentiment analysis score of 0.5 mean?***

Indeterminate sentimentA score of 0.5 might indicate that the sentiment of the text is indeterminate, and could result from text that does not have sufficient context to discern a sentiment or insufficient phrasing. For example, a list of words in a sentence that has no structure, could result in an indeterminate score.

***142. You are using the Text Analytics service for sentiment analysis. You have used the wrong language code. For example, A language code (such as “en” for English, or “fr” for French) is used to inform the service which language the text is in. What score does the service return?***

The service will return a score of precisely 0.5.

***143. What is Keyphrase extraction?***

Key phrase extraction is the concept of evaluating the text of a document, or documents, and then identifying the main talking points of the document(s).

***144. You are running a restaurant and have collected thousands of reviews through a number of surveys. You don't have time to go through each review but, you***

***want to know the most talking points. What feature of Text Analytics would help here?***

**Key phrase extraction:** you can use the key phrases to identify important elements of the review.

### ***145. What is Entity Recognition?***

You can provide the Text Analytics service with unstructured text and it will return a list of *entities* in the text that it recognizes. The service can also provide links to more information about that entity on the web. An entity is essentially an item of a particular type or a category; and in some cases, subtype

***146. You want to use the Text Analytics service to determine the key talking points in a text document. Which feature of the service should you use?***

Key phrase extraction

***147. You use the Text Analytics service to perform sentiment analysis on a document, and a score of 0.99 is returned. What does this score indicate about the document sentiment?***

The document is positive.

***148. When might you see NaN returned for a score in Language Detection?***

When the language is ambiguous

### ***149. What is Speech recognition?***

The ability to detect and interpret spoken input. Speech recognition is concerned with taking the spoken word and converting it into data that can be processed - often by transcribing it into a text representation. The spoken words can be in the form of a recorded voice in an audio file, or live audio from a microphone.

### **150. What is Speech synthesis?**

The ability to generate spoken output. Speech synthesis is in many respects the reverse of speech recognition. It is concerned with vocalizing data, usually by converting text to speech

### **151. What are the models you use to accomplish Speech recognition?**

An **acoustic model** that converts the audio signal into phonemes (representations of specific sounds). A **language model** that maps phonemes to words, usually using a statistical algorithm that predicts the most probable sequence of words based on the phonemes.

### **152. What are some of the use cases for speech recognition?**

- \* Providing closed captions for recorded or live videos
- \* Creating a transcript of a phone call or meeting
- \* Automated note dictation
- \* Determining intended user input for further processing

### **153. What are some of the use cases for speech synthesis?**

- \* Generating spoken responses to user input.
- \* Creating voice menus for telephone systems.
- \* Reading email or text messages aloud in hands-free scenarios.
- \* Broadcasting announcements in public locations, such as railway stations or airports.

### **154. What are the required elements for the speech synthesis?**

The text to be spoken.

The voice to be used to vocalize the speech. To synthesize speech, the system typically *tokenizes* the text to break it down into individual words, and assigns phonetic sounds to each word. It then breaks the phonetic transcription into *prosodic* units (such as phrases, clauses, or sentences) to create phonemes that will be converted to audio format. These phonemes are then synthesized as audio by applying a voice, which will determine parameters such as

pitch and timbre; and generating an audio wave form that can be output to a speaker or written to a file.

***155. What are the services for speech recognition and speech synthesis from Azure?***

The **Speech-to-Text** API

The **Text-to-Speech** API

***156. You want to use a service from Azure for just translating user spoken output to text. Which resource you should be provisioned in the Azure subscription?***

A **Speech** resource - choose this resource type if you only plan to use the Speech service, or if you want to manage access and billing for the resource separately from other services.

***157. You can use the speech-to-text API to perform real-time or batch transcription of audio into a text format. What does it mean?***

Real-time speech-to-text allows you to transcribe text in audio streams. You can use real-time transcription for presentations, demos, or any other scenario where a person is speaking. Not all speech-to-text scenarios are real time. You may have audio recordings stored on a file share, a remote server, or even on Azure storage. You can point to audio files with a shared access signature (SAS) URI and asynchronously receive transcription results.

***158. You have a person speaking right now and you want to transcribe that into written output. Which transcription should you use?***

Real-time transcription



**159. You have thousands of stored audio files and you want to transcribe that into written output. Which transcription should you use?**

Batch transcription

**160. Why Batch transcription is asynchronous?**

Batch transcription should be run in an asynchronous manner because the batch jobs are scheduled on a *best-effort basis*. Normally a job will start executing within minutes of the request but there is no estimate for when a job changes into the running state.

**161. You plan to build an application that uses the Speech service to transcribe audio recordings of phone calls into text and then submits the transcribed text to the Text Analytics service to extract key phrases. You want to manage access and billing for the application services in a single Azure resource. Which type of Azure resource should you create?**

Cognitive Services

**162. You want to use the Speech service to build an application that reads incoming email message subjects aloud. Which API should you use?**

Text-to-Speech

**163. What is Text Translation?**

Text translation can be used to translate documents from one language to another, translate email communications that come from foreign governments, and even provide the ability to translate web pages on the Internet. Many times you will see a *Translate* option for posts on social media sites, or the Bing search engine can offer to translate entire web pages that are turned in search results.

### 164. What is Speech Translation?

*Speech translation* is used to translate between spoken languages, sometimes directly (speech-to-speech translation) and sometimes by translating to an intermediary text format (speech-to-text translation).

### 165. What is the service from Microsoft Azure for Text Translation?

The **Translator Text** service, which supports text-to-text translation.

### 166. What is the service from Microsoft Azure for Speech Translation?

The **Speech** service, which enables speech-to-text and speech-to-speech translation.

### 167. What is the output if you use the Text Analytics service to detect entities in the following restaurant review extract:

***“I ate at the restaurant in Seattle last week.”***

Entity	Type	SubType	Wikipedia URL
Seattle	Location		<a href="https://en.wikipedia.org/wiki/Seattle">https://en.wikipedia.org/wiki/Seattle</a>
last week	DateTime	DateRange	

**168. What are the services you should provision in your Azure subscription if you want to manage access and billing for each service individually?**

There are dedicated **Translator Text** and **Speech** resource types

**169. The Text Translator service supports text-to-text translation of more than 60 languages. is this correct?**

True

**170. Using the Text Translate service you can specify one from a language with multiple to languages, enabling you to simultaneously translate a source document to multiple languages. Is this true?**

True

**171. How do you handle brand names which are the same in all languages when using Text Translate service?**

**Selective translation.** You can tag content so that it isn't translated.

**172. When using the Text Translate you can control profanity translation by either marking the translated text as profane or by omitting it in the results. Is this correct?**

**TrueProfanity filtering.** Without any configuration, the service will translate the input text, without filtering out profanity. Profanity levels are typically culture-specific but you can control profanity translation by either marking the translated text as profane or by omitting it in the results.

**173. \_\_\_\_\_ used to transcribe speech from an audio source to text format?**

Speech-to-text

**174. \_\_\_\_\_ used to generate spoken audio from a text source?**

Text-to-speech

**175. \_\_\_\_\_ used to translate speech in one language to text or speech in another?**

Speech Translation

**176. You are developing an application that must take English input from a microphone and generate a real-time text-based transcription in Hindi. Which service should you use?**

Speech

**177. You need to use the Translator Text service to translate email messages from Spanish into both English and French? What is the most efficient way to accomplish this goal?**

Make a single call to the service; specifying a "from" language of "es", a "to" language of "en", and another "to" language of "fr".

**178. On Microsoft Azure, language understanding is supported through the \_\_\_\_\_?**

Language Understanding Intelligent Service

**179. To work with Language Understanding, you need to take into account three core concepts. What are these concepts?**

*utterances, entities, and intents.*

**180. What are Utterances?**

An utterance is an example of something a user might say, and which your application must interpret. For example, when using a home automation system, a user might use the following utterances: "Switch the fan on." "Turn on the light."

**181. What are the Entities?**

An entity is an item to which an utterance refers. For example, **fan** and **light** in the following utterances: "Switch the **fan** on." "Turn on the **light**."

**182. What are Intents?**

An intent represents the purpose, or goal, expressed in a user's utterance. For example, for both of the previously considered utterances, the intent is to turn a device on; so in your Language Understanding application, you might define a **TurnOn** intent that is related to these utterances.

**183. What is None intent?**

In a Language Understanding application, the **None** intent is created but left empty on purpose. The None intent is a required intent and can't be deleted or renamed. Fill it with utterances that are outside of your domain.

**184. Creating a language understanding application with Language Understanding consists of two main tasks. What are these tasks?**

First you must define entities, intents, and utterances with which to train the language model - referred to as *authoring* the model.

Then you must publish the model so that client applications can use it for intent and entity *prediction* based on user input.

### ***185. How many types of entities and what are those?***

There are four types of entities:**Machine-Learned:** Entities that are learned by your model during training from context in the sample utterances you provide.**List:** Entities that are defined as a hierarchy of lists and sublists. For example, a **device** list might include sublists for **light** and **fan**. For each list entry, you can specify synonyms, such as **lamp** for **light**.**Regex:** Entities that are defined as a *regular expression* that describes a pattern – for example, you might define a pattern like `[0-9]{3}-[0-9]{3}-[0-9]{4}` for telephone numbers of the form **555-123-4567**.**Pattern.any:** Entities that are used with *patterns* to define complex entities that may be hard to extract from sample utterances.

### ***186. You need to provision an Azure resource that will be used to author a new Language Understanding application. What kind of resource should you create?***

Language Understanding

### ***187. You are authoring a Language Understanding application to support an international clock. You want users to be able to ask for the current time in a specified city, for example, “What is the time in London?”. What should you do?***

Define a "city" entity and a "GetTime" intent with utterances that indicate the city intent.

### ***188. You have published your Language Understanding application. What information does a client application developer need to get predictions from it?***

The endpoint and key for the application's prediction resource

# Describe features of conversational AI workloads on Azure (15–20%)

Practice questions based on these concepts

- Identify common use cases for conversational AI
- Identify Azure services for conversational AI

## **189. Name one example of Conversational AI?**

chat interface

## **190. What do you need to implement a conversation AI-based chatbot?**

A **knowledge base** of question and answer pairs -- usually with some built-in natural language processing model to enable questions that can be phrased in multiple ways to be understood with the same semantic meaning. A **bot service** that provides an interface to the knowledge base through one or more channels.

## **191. What is the Azure service to create and publish a knowledge base with built-in natural language processing capabilities?**

QnA Maker

## **192. What is the Azure service that provides a framework for developing, publishing, and managing bots on Azure?**

Azure Bot Service.

**193. You can write code to create and manage knowledge bases using the QnA Maker REST API or SDK. Is this true?**

True In most scenarios it is easier to use the QnA Maker portal.

**194. To create a knowledge base, you must first provision a QnA Maker resource in your Azure subscription. Is this true?**

True

**195. After provisioning a QnA Maker resource, you can use the QnA Maker portal to create a knowledge base that consists of question-and-answer pairs. What are the ways to get this knowledge base?**

- \* Generated from an existing FAQ document or web page.
- \* Imported from a pre-defined *chit-chat* data source.
- \* Entered and edited manually.

**196. Most of the time the knowledge base is created by FAQs. Is this true?**

False A knowledge base is created using a combination of all of these techniques; starting with a base dataset of questions and answers from an existing FAQ document, adding common conversational exchanges from a *chit-chat* source, and extending the knowledge base with additional manual entries.

**197. There are so many alternatives to asking a question how do you solve this problem while creating a knowledge base?**

Questions in the knowledge base can be assigned *alternative phrasing* to help consolidate questions with the same meaning. For example, you might include a question like: *What is your head office location?* You can anticipate different ways this question could be



asked by adding an alternative phrasing such as: *Where is your head office located?*

### ***198. How to train the knowledge base?***

After creating a set of question-and-answer pairs, you must train your knowledge base. This process analyzes your literal questions and answers and applies a built-in natural language processing model to match appropriate answers to questions, even when they are not phrased exactly as specified in your question definitions.

### ***199. How to test the knowledge base?***

After training, you can use the **built-in test interface in the QnA Maker portal** to test your knowledge base by submitting questions and reviewing the answers that are returned.

### ***200. When to publish the knowledge base?***

When you're satisfied with your trained knowledge base, you can publish it so that client applications can use it over its REST interface.

### ***201. What does client applications need to access the published knowledge base?***

- \* The knowledge base ID
- \* The knowledge base endpoint
- \* The knowledge base authorization key

### ***202. You have created and published a knowledge base. You want to deliver it to users through a custom bot. What should you do to accomplish this?***

You can create a custom bot by using the **Microsoft Bot Framework SDK** to write code that controls conversation flow and integrates with your QnA Maker knowledge base.

### ***203. How many ways you can create bots for your knowledge base?***

1. Custom bot by **Microsoft Bot Framework SDK**
2. Automatic bot creation functionality of QnA Maker

## ***204. What is the Automatic bot creation functionality of QnA Maker?***

The automatic bot creation functionality of QnA Maker enables you create a bot for your published knowledge base and publish it as an Azure Bot Service application with just a few clicks.

## ***205. Can you extend and configure the bot?***

Yes After creating your bot, you can manage it in the Azure portal, where you can:

- \* Extend the bot's functionality by adding custom code.

- \* Test the bot in an interactive test interface.

- \* Configure logging, analytics, and integration with other services.

## ***206. When your bot is ready you can connect to only one channel at one time. Is this true?***

False When your bot is ready to be delivered to users, you can connect it to multiple channels; making it possible for users to interact with it through web chat, email, Microsoft Teams, and other common communication media.

## ***207. Your organization has an existing frequently asked questions (FAQ) document. You need to create a QnA Maker knowledge base that includes the questions and answers from the FAQ with the least possible effort. What should you do?***

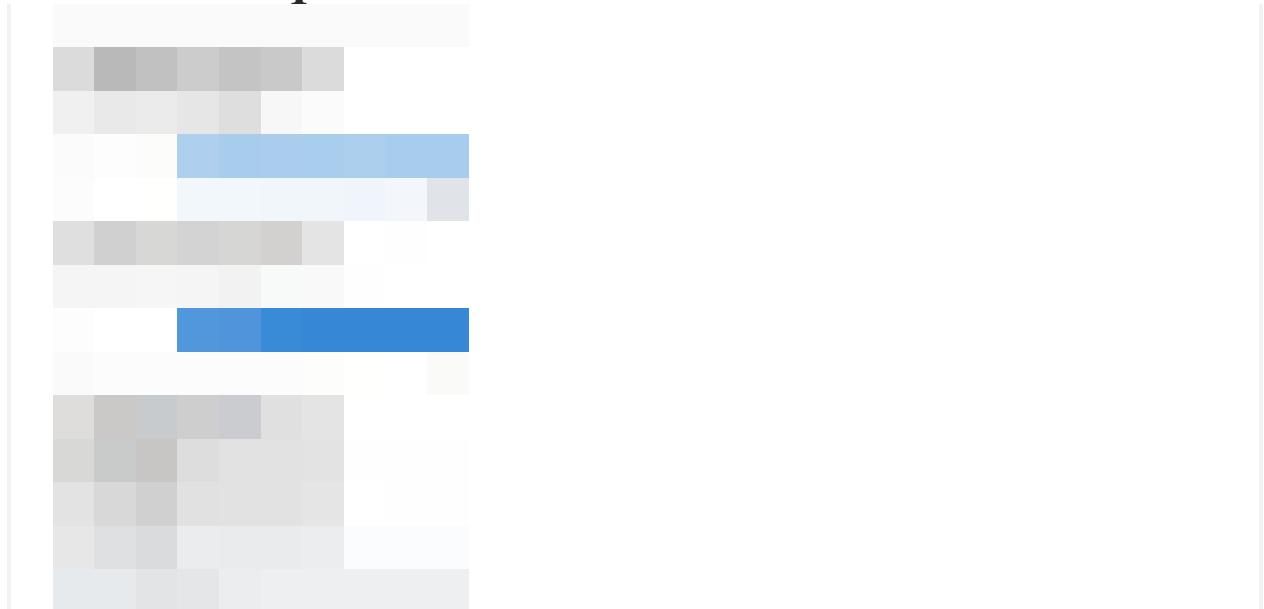
Import the existing FAQ document into a new knowledge base.

## ***208. You need to deliver a support bot for internal use in your organization. Some users want to be able to***

***submit questions to the bot using Microsoft Teams, others want to use a web chat interface on an internal web site. What should you do?***

Create a knowledge base. Then create a bot for the knowledge base and connect the Web Chat and Microsoft Teams channels for your bot

***209. Bots are designed to interact with users in a conversational manner, as shown in this example of a chat interface. What kind of Azure resource should we use to accomplish this?***



Hi. I'm the Adatum support bot. How can I help you?

Adatum Support at 10:50 AM

I have a question about my bill

You

OK. What's your account number?

Adatum Support at 10:50 AM

123-45-678A

You

Alright. I've found your details.  
Is your question about:  
1. The bill amount  
2. The due date  
3. Something else  
Enter 1, 2, or 3

Type your message here ...

Azure Bot Service.