Training Course AI-102: Designing and Implementing a Microsoft Azure AI Solution

Overview: AI-102 Designing and Implementing an Azure AI Solution is intended for software developers wanting to build AI infused applications that leverage Azure Cognitive Services, Azure Cognitive Search, and Microsoft Bot Framework. The course will use C# or Python as the programming language.

Duration: 4 Days.

Audience Profile: Software engineers concerned with building, managing and deploying AI solutions that leverage Azure Cognitive Services, Azure Cognitive Search, and Microsoft Bot Framework. They are familiar with C# or Python and have knowledge on using REST-based APIs to build computer vision, language analysis, knowledge mining, intelligent search, and conversational AI solutions on Azure.

Certification: This course prepares you for the AI-102: Designing and Implementing a Microsoft Azure AI Solution.

Course Objectives: After completing this course, students will be able to:

- Prepare to develop AI solutions on Azure.
- Create and consume Cognitive Services.
- Secure Cognitive Services.
- Monitor Cognitive Services.
- Deploy cognitive services in containers.
- Extract insights from text with the Language service.
- Translate text with the Translator service.
- Create speech-enabled apps with the Speech service.
- Translate speech with the speech service.
- Build a Language Understanding model.
- Publish and use a Language Understanding app.
- Build a question answering solution.
- Create a bot with the Bot Framework SDK.
- Create a Bot with the Bot Framework Composer.
- Analyze images.
- Analyze video.
- Classify images.
- Detect objects in images.
- Detect, analyze, and recognize faces.
- Read Text in Images and Documents with the Computer Vision Service.
- Extract data from forms with Form Recognizer.
- Create an Azure Cognitive Search solution.

- Create a custom skill for Azure Cognitive Search.
- Create a knowledge store with Azure Cognitive Search.

Course Outline

1- Prepare to develop AI solutions on Azure.
   - Define artificial intelligence.
   - Understand AI-related terms.
   - Understand considerations for AI Engineers.
   - Understand considerations for responsible AI.
   - Understand capabilities of Azure Machine Learning.
   - Understand capabilities of Azure AI Services.
   - Understand capabilities of the Azure Bot Service.
   - Understand capabilities of Azure Cognitive Search.

2- Create and consume Azure AI Services.
   - Provision Azure AI Services resources in an Azure subscription.
   - Identify endpoints, keys, and locations required to consume an Azure AI Services resource.
   - Use a REST API to consume an Azure AI service.
   - Use an SDK to consume an Azure AI service.

3- Secure Azure AI Services.
   - Consider authentication for Azure AI Services
   - Manage network security for Azure AI Services.

4- Monitor Azure AI Services.
   - Monitor Azure AI Services costs.
   - Create alerts.
   - View metrics.
   - Manage diagnostic logging.

5- Deploy Azure AI services in containers.
   - Create Containers for Reuse
   - Deploy to a Container
   - Secure a Container
   - Consume Azure AI Services from a Container.

6- Extract insights from text with the Azure AI Language service.
   - Detect language.
   - Extract key phrases.
   - Analyze sentiment.
   - Extract entities.

   o Extract linked entities.

7- Translate text with Azure AI Translator service.

   o Provision a Translator resource.
   o Understand language detection, translation, and transliteration.
   o Specify translation options.
   o Define custom translations.

8- Create speech-enabled apps with Azure AI services.

   o Provision an Azure resource for the Azure AI Speech service.
   o Use the Azure AI Speech to text API to implement speech recognition.
   o Use the Text to speech API to implement speech synthesis.
   o Configure audio format and voices.
   o Use Speech Synthesis Markup Language (SSML).

9- Translate speech with the Azure AI Speech service.

   o Provision Azure resources for speech translation.
   o Generate text translation from speech.
   o Synthesize spoken translations.

10- Build a conversational language understanding model.

   o Provision Azure resources for Azure AI Language resource.
   o Define intents, utterances, and entities.
   o Use patterns to differentiate similar utterances.
   o Use pre-built entity components.
   o Train, test, publish, and review an Azure AI Language model.

11- Develop an app with Azure AI Language.

   o Understand capabilities of an Azure AI Language Understanding model.
   o Process predictions from an Azure AI Language in your app.

12- Build a question answering solution.

   o Understand question answering.
   o Compare question answering to language understanding.
   o Create a knowledge base.
   o Implement multi-turn conversation.
   o Test and publish a knowledge base.
   o Consume a knowledge base.
   o Implement active learning.
   o Create a question answering bot.

13- Create a bot with the Bot Framework SDK.

- o   Understand principles of bot design.
- o   Use the Bot Framework SDK to build a bot.
- o   Deploy a bot to Azure.

14- Create a Bot with the Bot Framework Composer.

- o   Understand dialogs.
- o   Plan conversational flow.
- o   Design the user experience.
- o   Create a bot with the Bot Framework Composer.

15- Analyze images.

- o   Provision an Azure AI Vision resource.
- o   Analyze an image.
- o   Generate a smart-cropped thumbnail.

16- Analyze video.

- o   Describe Azure Video Indexer capabilities.
- o   Extract custom insights.
- o   Use Azure Video Indexer widgets and APIs.

17- Classify images.

- o   Provision Azure resources for Azure AI Custom Vision.
- o   Understand image classification.
- o   Train an image classifier.

18- Detect objects in images.

- o   Provision Azure resources for Azure AI Custom Vision.
- o   Understand object detection.
- o   Train an object detector.
- o   Consider options for labeling images.

19- Detect, analyze, and recognize faces.
- o   Identify options for face detection, analysis, and identification.
- o   Understand considerations for face analysis.
- o   Detect faces with the Azure AI Vision service.
- o   Understand capabilities of the Face service.
- o   Compare and match detected faces.
- o   Implement facial recognition.

20- Read Text in Images and Documents with the Azure AI Vision Service.
- o   Read text from images with the Read API.
- o   Use the Azure AI Vision service with SDKs and the REST API.

- o   Develop an application that can read printed and handwritten text.

21- Extract data from forms with Azure Document Intelligence.
- o   Identify how Azure Document Intelligence's layout service, prebuilt models, and custom service can automate processes.
- o   Use Azure Document Intelligence's Optical Character Recognition (OCR) capabilities with SDKs, REST API, and Azure Document Intelligence Studio.
- o   Develop and test custom models.

22- Create an Azure Cognitive Search solution.
- o   Create an Azure Cognitive Search solution.
- o   Develop a search application.

23- Create a custom skill for Azure Cognitive Search.
- o   Implement a custom skill for Azure Cognitive Search
- o   Integrate a custom skill into an Azure Cognitive Search skillset.

24- Create a knowledge store with Azure Cognitive Search.
- o   Create a knowledge store from an Azure Cognitive Search pipeline.
- o   View data in projections in a knowledge store.