A comprehensive study guide that will provide you with great preparation tools for the AI-102: Designing and Implementing a Microsoft Azure AI Solution exam

AI-102 Official Course Study Guide

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Introduction

Welcome to the AI-102 Study Guide. This guide will go over each topic of the skills outline, provided by Microsoft for the AI-102: Designing and Implementing a Microsoft Azure AI Solution.

Microsoft Azure AI engineers build, manage, and deploy AI solutions that make the most of Azure Cognitive Services and Azure services. Their responsibilities include participating in all phases of AI solutions development—from requirements definition and design to development, deployment, integration, maintenance, performance tuning, and monitoring.

These professionals work with solution architects to translate their vision and with data scientists, data engineers, IoT specialists, infrastructure administrators, and other software developers to build complete end-to-end AI solutions.

Azure AI engineers have experience developing solutions that use languages such as Python or C# and should be able to use REST-based APIs and software development kits (SDKs) to build secure image processing, video processing, natural language processing (NLP), knowledge mining, and conversational AI solutions on Azure. They should be familiar with all methods of implementing AI solutions. Plus, they understand the components that make up the Azure AI portfolio and the available data storage options. Azure AI engineers also need to understand and be able to apply responsible AI principles.

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About the exam

Accommodations

Microsoft designed certification exam accommodations to support candidates while maintaining high standards.

- Microsoft regularly approves requests for extra time for learning disabilities, ADHD, PTSD, or test anxiety, use of assistive technology, and much more.
- You must request accommodation before you schedule your exam.
- A request can take up to 10 days to be processed.

Register and schedule an exam

To register and schedule a Microsoft Certification exam, follow these steps:

1. **Select Your Exam**: Visit the certification overview or browse all certifications to find your desired exam, then click on the certification name.
2. **Schedule the Exam**: On the certification detail page, scroll to the "Schedule exam" section and click on the exam provider button.
3. **Choose an Exam Provider**:
    - For individual certifications or those part of a training program, select "Schedule with Pearson VUE".
    - For students, academic members, or those taking a Microsoft Office Specialist (MOS) exam, select "Schedule with Certiport".
4. **Account Setup**: You may be prompted to sign in or create a Microsoft Learn profile. It's recommended to use your personal Microsoft account (MSA). Ensure your legal name in the profile matches your identification to avoid issues on exam day.
5. **Provide Personal Information**: Enter required details such as address, phone number, and contact email. This information is necessary for Pearson VUE and isn't stored by Microsoft.
6. **Complete Registration**: After submitting your information, you'll be redirected to Pearson VUE to finalize the scheduling process.

Important Policies:

- **Exam Limits**: As of January 16, 2023, you can have a maximum of two Microsoft Certification exams scheduled simultaneously through Pearson VUE. After completing or canceling one, you can register for another. This policy doesn't affect scheduling through Certiport.
- **Scheduling Window**: Exams can be scheduled up to 90 days in advance. For further details, refer to Pearson VUE customer service for test-takers.

Exam Delivery Options:

- **Test Centers**: Ideal for those who prefer a quiet, pre-configured environment without the need to set up their own equipment.
- **Online Proctored Exams**: Offers the flexibility to take the exam from almost any location. Ensure your computer and exam area meet the required security standards.

System Requirements for Online Exams:

- If opting for an online exam, perform a system pre-check to confirm your computer meets the necessary requirements before registering. Detailed instructions are available in the About online exams with Pearson VUE section.

Exam Accommodations:

- If you have a disability and require accommodations, submit a request through the Request accommodations page before scheduling to allow time for review and necessary arrangements.

Pricing

- Taking the exam will cost you $165 US dollars (price based on the country or region in which the exam is proctored).

Prepare for an exam

Preparing effectively for a Microsoft Certification exam involves several key steps:

1. **Review this Study Guides**: Each exam has a study guide summarizing the topics covered, with links to additional resources. These guides help focus your studies and are available on the exam details page.
2. **Understand Skills Measured**: For Microsoft Office Specialist (MOS) exams, the "Skills measured" section on the exam details page provides a downloadable outline summarizing the exam topics.
3. **Watch Exam Prep Videos**: Some exams offer preparation videos that provide tips, strategies, and insights into key skills measured. These on-demand videos, led by Microsoft Certified Trainers (MCTs), highlight challenging objectives and include example questions with explanations.
4. **Engage in Self-Paced Training**: Microsoft Learn offers free online learning paths and modules tailored to various products, roles, and learning levels. These interactive tutorials are available in multiple languages and allow you to learn at your own pace.
5. **Participate in Instructor-Led Training**: For structured, in-depth learning, consider instructor-led courses delivered by Microsoft Certified Trainers. These courses provide personal attention and are centered around up-to-date course material to help you prepare for certification.
6. **Take Practice Assessments**: Some exams offer free Practice Assessments on Microsoft Learn. These assessments help you practice skills, assess your knowledge, and identify areas needing additional preparation. They provide an overview of the question style, wording, and difficulty you may encounter on the exam.

By utilizing these resources, you can enhance your preparation and increase your chances of success on Microsoft Certification exams.

Exam duration and exam experience

- Most exams have between 35-50 questions. The number of questions can vary between exam attempts because Microsoft regularly updates exams to reflect changes in the underlying technologies and solutions.
- For the exam, plan for 120 minutes: 100 minutes to answer questions and 20 minutes for instructions, comments, score reporting, etc. If your exam contains labs, you will have 120 minutes to answer questions and perform the hands-on tasks in the lab and 20 minutes for instructions, comments, and so on.
- The exam *can* contain at least one lab with approximately 10 tasks.
- The labs will be at the end of the exam, and you are informed in the introduction of the exam if there are labs.
- If your exam has labs, it will take on one of three forms. You will complete the tasks in a single virtual machine, in multiple VMs, or you will use the lab as a resource where you will explore the lab and answer a series of questions that can only be answered if you thoroughly understand what's in the lab.

- Because lab availability is based on any number of unpredictable factors, such as Azure outages and bandwidth, Microsoft cannot tell you which exams will have labs. However, you should prepare as if there will be one because this will get you the experience you need to be more likely to pass the exam.

Breaks
If you think you'll need a break during the exam, Microsoft has built time into the exam experience so that you can take one without requesting additional break time through the accommodation process. Five minutes have been built into the exam time that can be used for break time.

- Once a break is launched, you will not be able to return to the questions that you viewed before the break even if they are unanswered or marked for review.
- You can take a break at any point during the exam, including the middle of a case study, except in the middle of a lab or within our problem-solution question sets (where you are presented a problem and asked if the solution provided would solve the problem); breaks can be taken before or after these sections but not during them.

Question types
Microsoft Certification exams feature various question types designed to assess your knowledge and skills effectively. Here's an overview of these question types:

1. **Active Screen**: Requires you to interact with a simulated environment to complete tasks or answer questions.
2. **Build List**: Involves arranging items in a specific order or grouping them based on criteria.
3. **Case Studies**: Presents a detailed scenario where you analyze information and make decisions or recommendations.
4. **Drag and Drop**: Entails moving items to the correct location or matching them with corresponding elements.
5. **Hot Area**: Requires selecting specific areas within an image or diagram to answer a question.
6. **Multiple Choice**: Presents a question with several possible answers; you select the correct one.
7. **Labs**: Involves performing tasks in a simulated environment to demonstrate practical skills.
8. **Mark for Review**: Allows you to flag questions to revisit later during the exam.
9. **Review Screen**: Provides an overview of all questions, indicating which have been answered, marked for review, or left unanswered.

For Microsoft Office Specialist (MOS) exams, the questions are "Live-in-the-Application," requiring you to perform tasks directly within the Office application relevant to the certification.
Familiarizing yourself with these question types can enhance your exam experience and improve your performance.
For a visual overview of these question types, you might find the following video helpful:

Exam scoring, strategies, and score reports

Exam scores can range from 0-1000. Each exam has a cut or passing score. This score is used to determine if you have passed or failed. You must achieve a 700 on all of Microsoft exams to pass. This scaled scoring reflects both the required knowledge and the difficulty of the questions, so achieving 700 doesn't necessarily equate to answering 70% of questions correctly.

- Points are not deducted for incorrect answers, so make sure you answer every question.
- Read the instructions carefully. There may be questions on the exam that you cannot return to or review later. Make sure you don’t skip them.
- Some questions are worth more than 1 point. Keep in mind that there is no penalty for guessing so you should answer all the questions.

If you aren’t sure about an answer, you can mark most questions for review and return to them before leaving the section or exam.

Scoring Details:

- **Multiple-Part Questions**: Each correct component typically earns one point. You can receive full, partial, or no credit for these questions. If a question is worth more than one point, it will be indicated. There are no penalties for incorrect answers; unanswered questions simply don't earn points
- **Unscored Questions**: Some questions are included for research purposes and don't impact your score. Since these aren't identified, it's best to treat every question as if it counts.

Receiving Your Score:

- **Immediate Results**: For most exams, results are available within minutes, including your score and performance feedback. Exams with labs may take about 30 minutes longer. Scores are accessible in your Microsoft Learn profile within 24 hours.
- **Beta Exams**: Results for beta exams are provided after the exam completes the beta process and becomes live.
- **Certiport Exams**: For exams taken with Certiport, your final score and pass/fail status are displayed immediately upon completion. These results are also available in your Learn profile or Certiport dashboard within 24 hours.

Accessing Your Score Report:

1. **Via Microsoft Learn**:
    - Sign in to Microsoft Learn with the same account used to schedule your exam.
    - Navigate to your profile and select the "Certifications" section.
    - In the "Past exams" section, find your exam and click "View details on provider site" to access the exam provider's dashboard.
    - Locate your exam and select the 'View' button to see your score report.
2. **Directly via Pearson VUE**:
    - Follow the steps to schedule an exam by selecting a certification on the Browse Certifications page.
    - Provide necessary personal details when prompted.
    - Once redirected to the Pearson VUE Dashboard, click on the home icon and then select "View Score Report".

Understanding Your Score Report:

Your score report includes:

- A numeric score representing your overall performance.
- Pass/fail status.
- A bar chart illustrating your performance in each skill area assessed.
- Details on interpreting your results.

The bar chart highlights strengths and areas for improvement but doesn't specify the number of questions answered correctly in each section.

If You Don't Pass:

You can retake the exam 24 hours after your first attempt. For subsequent retakes, the waiting period varies. Review your score report to identify areas needing improvement and utilize available exam preparation resources. Microsoft doesn't disclose which specific questions were answered incorrectly.

Online proctored exams

Online proctored exams offer the convenience of taking Microsoft certification tests from your home or office, eliminating the need to travel to a test center. Microsoft partners with Pearson VUE to deliver these exams, ensuring a secure and monitored environment.

Before Registering for an Online Proctored Exam:

- **System Requirements**: Conduct a system test on the computer you plan to use for the exam to ensure compatibility. If your system doesn't pass, it's advisable to schedule the exam at a test center.
- **Identification**: Prepare a clear photo of your identification documents for identity verification during the exam. Unclear photos may lead to disqualification.
- **Testing Protocol**: Familiarize yourself with the online testing procedures, including video and audio monitoring requirements, to know what to expect during the exam.
- **Accommodations**: If you use assistive technologies, request accommodations in advance to ensure they're permitted during the exam.

Starting Your Online Proctored Exam:

1. Log in to your Microsoft Learn profile with the personal Microsoft account associated with your certification profile.
2. Navigate to the "Certifications" section in your profile.
3. Locate your scheduled exam appointment and select the "Go to the exam" button.
4. Follow the on-screen instructions to download and install the secure browser required for the exam.

It's recommended to log in 15 minutes before your scheduled time to complete the check-in process smoothly.

Renewing

The AI-102 exam will need to be renewed every year. Microsoft will occasionally retire certifications, however, and you may also find exam numbers evolve (this is what happened with the previous exam AI-100) when Microsoft changes the curriculum substantially for the certification. You can take the renewal assessment any time during your six-month eligibility window, via Microsoft Learn. Once you pass, your certification will be extended one year from the expiration date.

There’s no cost to renew your certification, just make sure you pass the online assessment before your certification expires. Fundamentals certifications do not expire.

Assessments focus on recent technological and industry updates, so they’re shorter than the original exam(s) and are open book. You can take the assessment as many times as you need as long as you pass before your certification expires.

Video training:

Udemy	This course goes through all of the skills needed to take and pass the AI-102 exam: Designing and Implementing a Microsoft Azure AI Solution. This course teaches all of the requirements for the exam, one by one. Each of the things that Microsoft tests will be covered in this course. AI-102 Microsoft Azure AI Solution Complete Exam Prep 2024 | Udemy
PLURALSIGHT	This path is designed for Microsoft Azure AI Engineer Associate certification preparation. It focuses on the skills needed to build computer vision, natural language processing, knowledge mining, and conversational AI solutions on Azure. Microsoft Exam AI-102: Designing and Implementing a Microsoft Azure AI Solution Path | Pluralsight
in	Linkedin's Microsoft Azure Exam AI-102 Online Course helps Professionals to prepare themselves for the actual certification exam. Azure AI Engineer Associate

Microsoft Learn:
Those tutorials/paths have been combined by Microsoft and published for free. They contain a collection of text, videos, and exercises for the exam.

	Get started with Azure AI Services Microsoft Azure offers multiple services that enable developers to build amazing AI-powered solutions. Proper planning and preparation involves identifying the services you'll use and creating an optimal working environment for your development team. Get started with Azure AI Services - Training | Microsoft Learn

	**Create computer vision solutions with Azure AI Vision** Computer vision is an area of artificial intelligence that deals with visual perception. Azure AI Vision includes multiple services that support common computer vision scenarios. Create computer vision solutions with Azure AI Vision AI-3004 - Training | Microsoft Learn
	**Develop natural language processing solutions with Azure AI Services** Natural language processing (NLP) solutions use language models to interpret the semantic meaning of written or spoken language. You can use the Language Understanding service to build language models for your applications. Develop natural language processing solutions with Azure AI Services AI-3003 - Training | Microsoft Learn
	**Implement knowledge mining with Azure AI Search** Do you have information locked up in structured and unstructured data sources? Using Azure AI Search, you can extract key insights from this data, and enable applications to search and analyze them. Implement knowledge mining with Azure AI Search - Training | Microsoft Learn
	**Develop solutions with Azure AI Document Intelligence** In this learning path, discover how Azure AI Document Intelligence solutions can enable you to capture data from typed or hand-written forms. Learn how to build a solution for your custom form types and integrate that solution into an Azure Cognitive Search pipeline. Develop solutions with Azure AI Document Intelligence AI-3002 - Training | Microsoft Learn

	Develop Generative AI solutions with Azure OpenAI Service Azure OpenAI Service provides access to OpenAI's powerful large language models such as GPT and Embeddings models. These models enable various natural language processing (NLP) solutions to understand, converse, and generate content. Users can access the service through REST APIs, SDKs, and Azure AI Foundry. Develop Generative AI solutions with Azure OpenAI Service - Training | Microsoft Learn

Practice exams

Those are practice exams and not dumps. I do not encourage dumps as they ruin the certification value for everyone.

Udemy	This course goes through all of the skills needed to take and pass the AI-102 exam: Designing and Implementing a Microsoft Azure AI Solution. This course teaches all of the requirements for the exam, one by one. Each of the things that Microsoft tests will be covered in this course. AI-102 Azure AI Engineer 100% Original Practice Exam OCT'24 | Udemy

This guide is divided up into the following sections and is also part of the exam:

- Plan and manage an Azure AI solution (20–25%)
- Implement generative AI solutions (15–20%)
- Implement an agentic solution (5–10%)
- Implement computer vision solutions (10–15%)
- Implement natural language processing solutions (15–20%)
- Implement knowledge mining and information extraction solutions (15–20%)

Feel free to join our Facebook Azure Study Group, or check out the other Azure courses on Udemy. Errors and suggestions can also be reported in the Azure Group on Facebook.

Thank you,

Get Cloud Skills team
Jordi Koenderink

Plan and Manage an Azure AI Solution (20-25%)

Select the appropriate Azure AI service

Select the appropriate service for a generative AI solution

- Resource selection recommendations for AI workloads on Azure - Cloud Adoption Framework | Microsoft Learn

Select the appropriate service for a computer vision solution

- What is Azure AI Vision? - Azure AI services | Microsoft Learn
    - OCR - Optical Character Recognition - Azure AI services | Microsoft Learn
    - What is Image Analysis? - Azure AI services | Microsoft Learn
    - What is the Azure AI Face service? - Azure AI services | Microsoft Learn
    - Analyze video - Training | Microsoft Learn

Select the appropriate service for a natural language analysis solution

- What is Azure AI Language - Azure AI services | Microsoft Learn
    - Choose an Azure AI targeted language processing technology - Azure Architecture Center | Microsoft Learn

Select the appropriate service for a speech solution

- Choose an Azure speech recognition and generation technology - Azure Architecture Center | Microsoft Learn
    - What is the Speech service? - Azure Cognitive Services | Microsoft Docs
        - Batch transcription overview - Speech service - Azure AI services | Microsoft Learn
        - Intent recognition overview - Speech service - Azure AI services | Microsoft Learn
        - Use pronunciation assessment - Azure AI services | Microsoft Learn
        - Speaker recognition overview - Azure AI services | Microsoft Learn
        - Speech to text overview - Speech service - Azure AI services | Microsoft Learn
        - Text to speech overview - Speech service - Azure AI services | Microsoft Learn
        - Speech translation overview - Speech service - Azure AI services | Microsoft Learn
        - Video translation overview - Speech service - Azure AI services | Microsoft Learn
    - What is Azure AI Immersive Reader? - Azure AI services | Microsoft Learn

Select the appropriate service for an information extraction solution

- Document Processing with Azure AI Samples - Code Samples | Microsoft Learn

Select the appropriate service for a knowledge mining solution

- Knowledge Mining | Microsoft Azure
    - Introduction to Azure AI Search - Azure AI Search | Microsoft Learn

Plan, create, and deploy an Azure AI service

Plan for a solution that meets Responsible AI principles

- Responsible AI in Azure Workloads - Microsoft Azure Well-Architected Framework | Microsoft Learn

Create an Azure AI resource

- Create an Azure AI services resource - Azure AI services | Microsoft Learn
- How-to: Create and deploy an Azure OpenAI Service resource - Azure OpenAI | Microsoft Learn
- Create workspace resources - Azure Machine Learning | Microsoft Learn

Choose the appropriate AI models for your solution

- How to Choose the Right Models for Your Apps | Azure AI

Deploy AI models using the appropriate deployment options

- Deploy models in Azure AI Foundry portal - Azure AI Foundry | Microsoft Learn

Install and utilize the appropriate SDKs and APIs

- How to get started with Azure AI Foundry SDK - Azure AI Foundry | Microsoft Learn
- Azure AI services SDK reference - Azure AI services | Microsoft Learn

Determine a default endpoint for a service

- Configure Virtual Networks for Azure AI services - Azure AI services | Microsoft Learn
- Develop Azure AI services applications with Azure Key Vault - Azure AI services | Microsoft Learn
- Authentication in Azure AI services - Azure AI services | Microsoft Learn
- Azure virtual network service endpoints | Microsoft Learn

Integrate Azure AI services into a continuous integration and continuous delivery (CI/CD) pipeline

- Model lifecycle of custom speech - Speech service - Azure AI services | Microsoft Learn
- DevOps-For-AI-Apps/Tutorial.md at master · Azure/DevOps-For-AI-Apps · GitHub
- Continuous integration with Azure Pipelines - Azure Resource Manager | Microsoft Learn

Plan and implement a container deployment

- Deploy Azure AI services in containers - Training | Microsoft Learn
- Use Azure AI containers on-premises - Azure AI services | Microsoft Learn

Manage, monitor, and secure an Azure AI service

Monitor an Azure AI resource

- Monitor Azure OpenAI Service - Azure AI services | Microsoft Learn
- Continuously Monitor your Generative AI Applications - Azure AI Foundry | Microsoft Learn
- Monitor Azure AI Search | Microsoft Learn

Manage costs for Azure AI services

- Plan to manage costs - Azure Machine Learning | Microsoft Learn
- Plan and manage costs for Azure AI Foundry - Azure AI Foundry | Microsoft Learn
- Plan to manage costs for model inference in Azure AI Services | Microsoft Learn
- Plan to manage costs for Azure OpenAI Service - Azure AI services | Microsoft Learn
- Plan and manage costs - Azure AI Search | Microsoft Learn

Manage and protect account keys

- How to Secure Azure OpenAI Keys Using Environment Variables, Azure Vault, and Streamlit Secrets | Microsoft Community Hub
- Customer-Managed Keys for Azure AI services - Azure AI services | Microsoft Learn
- Encrypt data using customer-managed keys - Azure AI Search | Microsoft Learn

Manage authentication for an Azure AI Service resource

- Authenticate to Azure OpenAI API - Azure API Management | Microsoft Learn
- Authentication in Azure AI services - Azure AI services | Microsoft Learn

Implement AI solutions responsibly

Implement content moderation solutions

- What is Azure AI Content Safety? - Azure AI services | Microsoft Learn
- Use AI responsibly with Azure AI Content Safety - Training | Microsoft Learn

Configure responsible AI insights, including content safety

- Transparency Note and use cases for AI Content Safety - Azure AI services | Microsoft Learn
- Data, privacy, and security for AI Content Safety - Azure AI services | Microsoft Learn
- Limited Access to Content Safety - Azure AI services | Microsoft Learn

Implement responsible AI, including content filters and blocklists

- How to use blocklists with Azure OpenAI Service - Azure OpenAI | Microsoft Learn
- Azure OpenAI Service content filtering - Azure OpenAI | Microsoft Learn

Prevent harmful behavior, including prompt shields and harm detection

- General availability of Prompt Shields in Azure AI Content Safety and Azure OpenAI Service | Microsoft Community Hub
- Harm categories in Azure AI Content Safety - Azure AI services | Microsoft Learn
- Prompt Shields in Azure AI Content Safety - Azure AI services | Microsoft Learn

Design a responsible AI governance framework

- Responsible AI in Azure Workloads - Microsoft Azure Well-Architected Framework | Microsoft Learn
- Governance recommendations for AI workloads on Azure - Cloud Adoption Framework | Microsoft Learn
- Governance recommendations for AI workloads on Azure - Cloud Adoption Framework | Microsoft Learn

Implement generative AI-solutions (15-20%)

Build generative AI solutions with Azure AI Foundry

Plan and prepare for a generative AI solution

- Generative AI app developer workflow - Azure Databricks | Microsoft Learn

Deploy a hub, project, and necessary resources with Azure AI Foundry

- Manage, collaborate, and organize with hubs - Azure AI Foundry | Microsoft Learn
- How to create and manage an Azure AI Foundry hub - Azure AI Foundry | Microsoft Learn

Deploy the appropriate generative AI model for your use case

- Model selection and temperature settings | Microsoft Learn
- Resource selection recommendations for AI workloads on Azure - Cloud Adoption Framework | Microsoft Learn
- How to Choose the Right Models for Your Apps | Azure AI

Implement a prompt flow solution

- Get started with prompt flow - Azure Machine Learning | Microsoft Learn

Implement a RAG pattern by grounding a model in your data

- Implement Retrieval Augmented Generation (RAG) with Azure OpenAI Service - Training | Microsoft Learn

Evaluate models and flows

- Submit a batch run to evaluate a prompt flow - Azure Machine Learning | Microsoft Learn
- Evaluation flow and metrics in prompt flow - Azure Machine Learning | Microsoft Learn
- Evaluate Semantic Kernel with prompt flow - Azure Machine Learning | Microsoft Learn

Integrate your project into an application with Azure AI Foundry SDK

- How to get started with Azure AI Foundry SDK - Azure AI Foundry | Microsoft Learn
- Using Azure AI Foundry SDK for your AI apps and agents - YouTube

Utilize prompt templates in your generative AI solution

- Get started with prompt library | Microsoft Learn
- How to get started with an AI template - Azure AI Foundry | Microsoft Learn

Use Azure OpenAI Service to generate content

Provision an Azure OpenAI Service resource

- How-to: Create and deploy an Azure OpenAI Service resource - Azure OpenAI | Microsoft Learn

Select and deploy an Azure OpenAI model

- Azure OpenAI Service models - Azure OpenAI | Microsoft Learn

Submit prompts to generate code and natural language responses

- Azure OpenAI Responses API - Azure OpenAI | Microsoft Learn

Use the DALL-E model to generate images

- Quickstart: Generate images with Azure OpenAI Service - Azure OpenAI | Microsoft Learn

Integrate Azure OpenAI into your own application

- Deploy an application that uses OpenAI on Azure App Service - Azure App Service | Microsoft Learn

Use large multimodal models in Azure OpenAI

- Building a multimodal, multi-agent system using Azure AI Agent Service and OpenAI Agent SDK | Microsoft Community Hub

Implement an Azure OpenAI Assistant

- How to create Assistants with Azure OpenAI Service - Azure OpenAI | Microsoft Learn

Optimize and operationalize a generative AI solution

Configure parameters to control generative behavior

- Apply prompt engineering with Azure OpenAI Service - Training | Microsoft Learn
- Design system messages with Azure OpenAI - Azure OpenAI Service | Microsoft Learn

Configure model monitoring and diagnostic settings, including performance and resource consumption

- Monitor Azure OpenAI Service - Azure AI services | Microsoft Learn

Optimize and manage resources for deployment, including scalability and foundational model updates

- Resource selection recommendations for AI workloads on Azure - Cloud Adoption Framework | Microsoft Learn
- Compute recommendations for AI workloads on Azure infrastructure (IaaS) - Cloud Adoption Framework | Microsoft Learn
- AI Ready – Process to build AI workloads in Azure - Cloud Adoption Framework | Microsoft Learn

Enable tracing and collect feedback

- Trace your application with Azure AI Foundry project library - Azure AI Foundry | Microsoft Learn
- Enable trace and collect feedback for a flow deployment - Azure Machine Learning | Microsoft Learn

Implement model reflection

- Evaluation of generative AI applications with Azure AI Foundry - Azure AI Foundry | Microsoft Learn

Deploy containers for use on local and edge devices

- Use Azure AI containers on-premises - Azure AI services | Microsoft Learn
- Tutorial - Deploy Custom Vision classifier to a device using Azure IoT Edge | Microsoft Learn

Implement orchestration of multiple generative AI models

- Get Started with Multi-agent Applications Using Azure OpenAI | Microsoft Learn

- MLOps and GenAIOps for AI Workloads on Azure - Microsoft Azure Well-Architected Framework | Microsoft Learn

Apply prompt engineering techniques to improve responses

- Apply prompt engineering with Azure OpenAI Service - Training | Microsoft Learn

Fine-tune a generative model

- Azure OpenAI Service fine-tuning considerations - Azure AI services | Microsoft Learn
- Finetuning and Customizing your Generative AI Apps | Microsoft Learn
- Customize a model with Azure OpenAI Service - Azure OpenAI | Microsoft Learn

Implement an agentic solution (5–10%)

Create custom agents

Understand the role and use cases of an agent

- What is Azure AI Agent Service? - Azure AI services | Microsoft Learn

Configure the necessary resources to build an agent

- Quickstart - Create a new Azure AI Agent Service project - Azure AI services | Microsoft Learn

Create an agent with the Azure AI Agent Service

- Quickstart - Create a new Azure AI Agent Service project - Azure AI services | Microsoft Learn

Implement complex agents with Semantic Kernel and Autogen

- Using Azure AI Agent Service with AutoGen / Semantic Kernel to build a multi-agent's solution | Microsoft Community Hub

Implement complex workflows including orchestration for a multi-agent solution, multiple users, and autonomous capabilities

- Building a multimodal, multi-agent system using Azure AI Agent Service and OpenAI Agent SDK | Microsoft Community Hub

Test, optimize and deploy an agent

- Deploy Your First Azure AI Agent Service on Azure App Service | Microsoft Community Hub

Implement computer vision solutions (10–15%)

Analyze images

Select visual features to meet image processing requirements

- What is Image Analysis? - Azure AI services | Microsoft Learn

Detect objects in images and generate image tags

- Object detection - Azure AI Vision - Azure AI services | Microsoft Learn

Include image analysis features in an image processing request

- Quickstart: Image Analysis 4.0 - Azure AI services | Microsoft Learn

Interpret image processing responses

- Call the Image Analysis 4.0 Analyze API - Azure AI services | Microsoft Learn

Extract text from images using Azure AI Vision

- OCR - Optical Character Recognition - Azure AI services | Microsoft Learn
- OCR for images - Azure AI Vision - Azure AI services | Microsoft Learn

Convert handwritten text using Azure AI Vision

- OCR - Optical Character Recognition - Azure AI services | Microsoft Learn

Implement custom vision models

Choose between image classification and object detection models

- Object Detection vs Image Classification: Simple Comparision - KiKaBeN
- Images Classification and Object Detection Metrics (analyticsvidhya.com)

Label images

- Tag images faster with Smart Labeler - Azure AI services | Microsoft Learn

Train a custom image model, including image classification and object detection

- Quickstart: Build an object detector with the Custom Vision website - Azure AI services | Microsoft Learn
- Quickstart: Image classification with Custom Vision SDK - Azure AI services | Microsoft Learn

Evaluate custom vision model metrics

- Quickstart: Build an image classification model with the Custom Vision portal - Azure AI services | Microsoft Learn

Publish a custom vision model

- Use prediction endpoint to programmatically test images with classifier - Custom Vision - Azure AI services | Microsoft Learn

Consume a custom vision model

- Use prediction endpoint to programmatically test images with classifier - Custom Vision - Azure AI services | Microsoft Learn

Build a custom vision model code first

- Quickstart: Build an image classification model with the Custom Vision portal - Azure AI services | Microsoft Learn

Analyze videos

Use Azure AI Vision Spatial Analysis to detect presence and movement of people in video

- Choose Azure AI image and video processing technology - Azure Architecture Center | Microsoft Learn

Use Azure AI Video Indexer to extract insights from a video or live stream

- Azure Video Indexer insights overview - Azure Video Indexer | Microsoft Learn
- Video Indexer - Unlock Insights from your video | AI Show | Channel 9 (msdn.com)

Implement Natural Language Processing Solutions (15-20%)

Analyze and translate text

Extract key phrases and entities

- What is key phrase extraction in Azure AI Language? - Azure AI services | Microsoft Learn
- Entity categories recognized by Named Entity Recognition in Azure AI Language - Azure AI services | Microsoft Learn
- What is the Named Entity Recognition (NER) feature in Azure AI Language? - Azure AI services | Microsoft Learn

Determine sentiment of text

- How to perform sentiment analysis and opinion mining - Azure AI services | Microsoft Learn
- What is sentiment analysis and opinion mining in the Language service? - Azure AI services | Microsoft Learn

Detect the language used in text

- What is language detection in Azure AI Language? - Azure AI services | Microsoft Learn

Detect personally identifiable information (PII)

- What is the Personally Identifying Information (PII) detection feature in Azure Cognitive Service for Language? - Azure Cognitive Services | Microsoft Learn
- How to detect Personally Identifiable Information (PII) - Azure Cognitive Services | Microsoft Learn
- PII Detection cognitive skill - Azure Cognitive Search | Microsoft Learn

Translate text and documents by using the Translator service

- Quickstart: Azure AI Translator client libraries - Azure AI services | Microsoft Learn
- Quickstart: Azure AI Translator REST APIs - Azure AI services | Microsoft Learn
- Batch Document translation C#/.NET or Python client library - Azure AI services | Microsoft Learn
- Quickstart: Document translation REST API - Azure AI services | Microsoft Learn

Process and translate speech

Integrate generative AI speaking capabilities in an application

- Generative AI Applications for Developers | Microsoft Learn

Implement text-to-speech and speech-to-text using Azure AI Speech

- Speech to text overview - Speech service - Azure AI services | Microsoft Learn
- Text to speech overview - Speech service - Azure AI services | Microsoft Learn
- Text to speech quickstart - Speech service - Azure AI services | Microsoft Learn
- Speech to text quickstart - Azure AI services | Microsoft Learn

Improve text-to-speech by using Speech Synthesis Markup Language (SSML)

- Custom neural voice overview - Speech service - Azure AI services | Microsoft Learn
- Speech Synthesis Markup Language (SSML) overview - Speech service - Azure AI services | Microsoft Learn
- Voice and sound with Speech Synthesis Markup Language (SSML) - Speech service - Azure AI services | Microsoft Learn

Implement custom speech solutions with Azure AI Speech

- Custom speech overview - Speech service - Azure AI services | Microsoft Learn
- Improve recognition accuracy with phrase list - Azure AI services | Microsoft Learn
- Improve speech-to-text accuracy with Azure Custom Speech | Microsoft Azure Blog
- Improve recognition accuracy with phrase list - Azure AI services | Microsoft Learn

Implement intent and keyword recognition with Azure AI Speech

- Intent recognition overview - Speech service - Azure AI services | Microsoft Learn
- Keyword recognition overview - Speech service - Azure AI services | Microsoft Learn
- Keyword recognition recommendations and guidelines - Speech service - Azure AI services | Microsoft Learn
- Create a custom keyword quickstart - Speech service - Azure AI services | Microsoft Learn
- How to recognize intents with simple language pattern matching - Azure AI services | Microsoft Learn

Translate speech-to-speech and speech-to-text by using the Azure AI Speech service

- Speech translation overview - Speech service - Azure AI services | Microsoft Learn

Implement custom language models

Create intents, entities, and add utterances

- How to build a Conversational Language Understanding project schema - Azure AI services | Microsoft Learn

Train, evaluate, deploy, and test a language understanding model

How to train and evaluate models in Conversational Language Understanding - Azure AI services | Microsoft Learn

How to deploy a model for conversational language understanding - Azure AI services | Microsoft Learn

Optimize, backup, and recover language understanding model

- Back up and recover your conversational language understanding models - Azure AI services | Microsoft Learn

Consume a language model from a client application

- Use the Language SDK and REST API - Azure AI services | Microsoft Learn

Create a custom question answering project

- Create, test, and deploy your custom question answering project - Azure AI services | Microsoft Learn

Add question-and-answer pairs and import sources for question answering

- Best practices - custom question answering - Azure AI services | Microsoft Learn

Train, test, and publish a knowledge base

Create a multi-turn conversation

- Add guided conversations with multi-turn prompts - Azure AI services | Microsoft Learn

Add alternate phrasing and chit-chat to a knowledge base

- Best practices - custom question answering - Azure AI services | Microsoft Learn
- Enrich your project with active learning - Azure AI services | Microsoft Learn
- Adding chitchat to a custom question answering project - Azure AI services | Microsoft Learn

Export a knowledge base

- Export/import/refresh - Azure AI services | Microsoft Learn

Create a multi-language question answering solution

- Orchestration workflows - Azure AI services | Microsoft Learn
- Integrate custom question answering and conversational language understanding with orchestration workflow - Azure AI services | Microsoft Learn
- Create orchestration workflow projects and use Azure resources - Azure AI services | Microsoft Learn
- Create projects in multiple languages - custom question answering - Azure AI services | Microsoft Learn

Implement knowledge mining and information extraction solutions (15–20%)

Implement an Azure AI Search solution

Provision an Azure AI Search resource, create an index, and define a skillset

- Quickstart: Keyword Search in the Azure Portal - Azure AI Search | Microsoft Learn

Create data sources and indexers

- Indexer overview - Azure AI Search | Microsoft Learn

Implement custom skills and include them in a skillset

- Skills reference - Azure AI Search | Microsoft Learn
- Create a skillset - Azure AI Search | Microsoft Learn

Create and run an indexer

- Create an indexer - Azure AI Search | Microsoft Learn

Query an index, including syntax, sorting, filtering, and wildcards

- Quickstart: Search Explorer Query Tool - Azure AI Search | Microsoft Learn
- Simple query syntax - Azure AI Search | Microsoft Learn
- Examples of simple syntax - Azure AI Search | Microsoft Learn

Manage Knowledge Store projections, including file, object, and table projections

- Projection concepts - Azure AI Search | Microsoft Learn
- Define projections - Azure AI Search | Microsoft Learn
- Projection examples - Azure AI Search | Microsoft Learn

Implement semantic and vector store solutions

- Using the Semantic Kernel Azure AI Search Vector Store connector (Preview) | Microsoft Learn

- Vector search - Azure AI Search | Microsoft Learn
- Vector store database - Azure AI Search | Microsoft Learn

Implement an Azure AI Document Intelligence solution

Provision a Document Intelligence resource

- Create a Document Intelligence resource - Azure AI services | Microsoft Learn

Use prebuilt models to extract data from documents

- Read model OCR data extraction - Document Intelligence - Azure AI services | Microsoft Learn
- Document Processing with Azure AI Samples - Code Samples | Microsoft Learn

Implement a custom document intelligence model

- Custom document models - Document Intelligence - Azure AI services | Microsoft Learn
- Build and train a custom model - Document Intelligence - Azure AI services | Microsoft Learn

Train, test, and publish a custom document intelligence model

- Build and train a custom model - Document Intelligence - Azure AI services | Microsoft Learn

Create a composed document intelligence model

- Composed custom models - Document Intelligence - Azure AI services | Microsoft Learn
- How to guide: create and compose custom models with Document Intelligence - Azure AI services | Microsoft Learn

Extract information with Azure AI Content Understanding

Create an OCR pipeline to extract text from images and documents

- Extract text from images by using AI enrichment - Azure AI Search | Microsoft Learn

Summarize, classify, and detect attributes of documents

- Use Azure AI Content Understanding Analyzer templates in the Azure AI Foundry - Azure AI services | Microsoft Learn
- Quickstart: Azure AI Content Understanding REST APIs - Azure AI services | Microsoft Learn

Extract entities, tables, and images from documents

- Quickstart: Azure AI Content Understanding REST APIs - Azure AI services | Microsoft Learn

Process and ingest documents, images, videos, and audio with Azure AI Content Understanding

- Azure AI Content Understanding Capabilities Overview - Azure AI services | Microsoft Learn