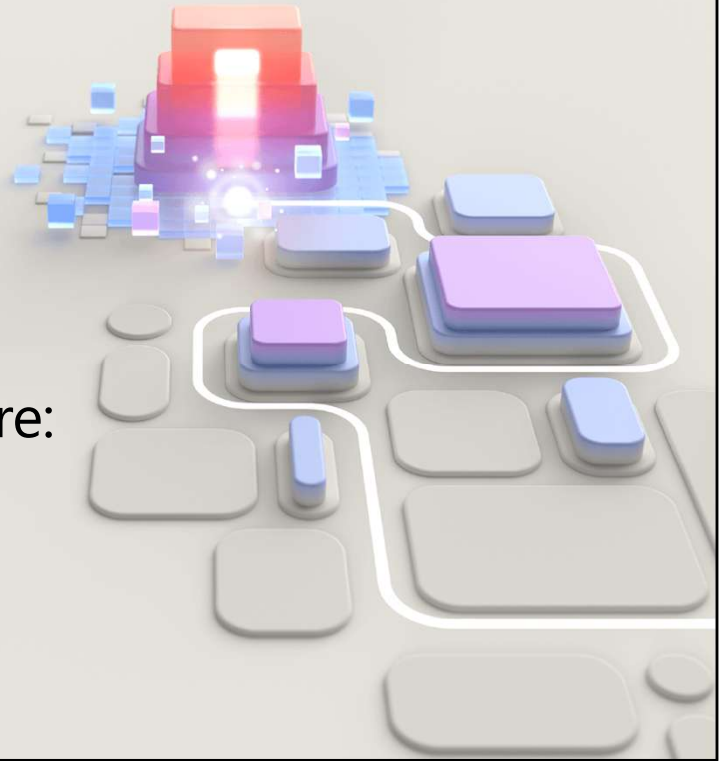





# Introduction to AI in Azure: AI Overview

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## Agenda



- Introduction to AI concepts
- Get started with Microsoft Foundry

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Time estimates:

- Introduction to AI concepts – 15 mins
- Get started with Microsoft Foundry – 15 mins

# Introduction to AI concepts

<https://aka.ms/mslearn-ai-concepts>

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Use the link on the slide to see the Microsoft Learn module from which this presentation is derived.

(Note that the slide content may not match 1:1 with the self-paced content on Microsoft Learn, but it should reflect the same key learning objectives in relation to general AI concepts).

# What is Artificial Intelligence?

## Software that imitates human capabilities

- Predicting outcomes and recognizing patterns based on historic data.
- Recognizing abnormal events, making decisions, and taking appropriate action.
- Interpreting visual input.
- Understanding language and engaging in conversations.
- Extracting information from sources to gain knowledge.

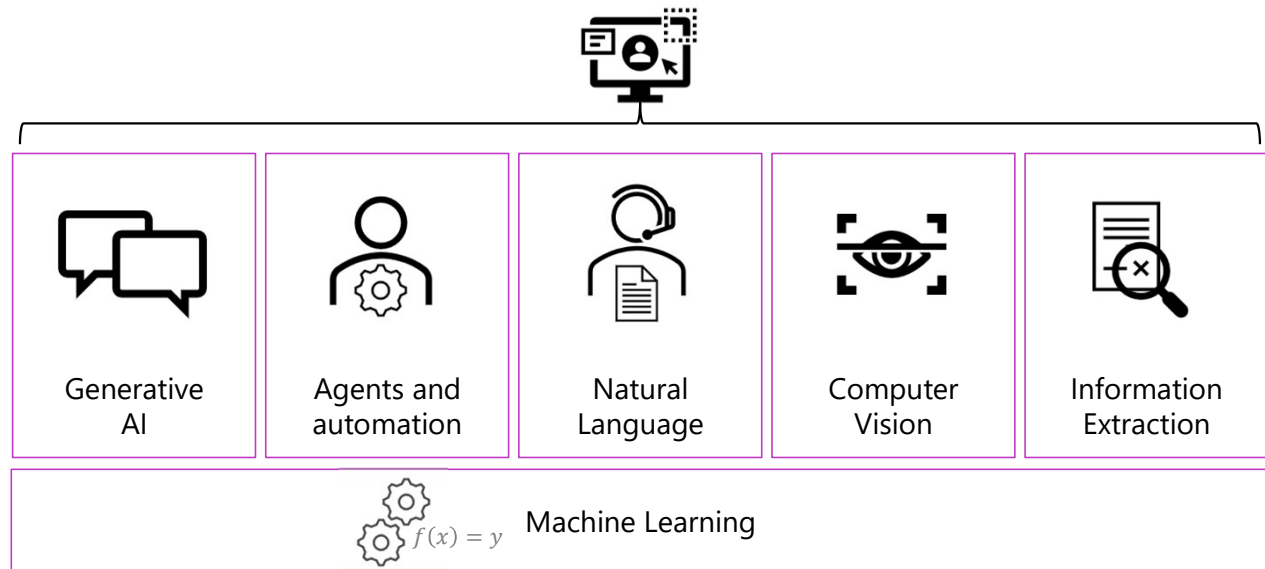


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These are all things that most humans do on a day-to-day basis, often subconsciously:

- We make predictions or recognize patterns using the information we have available and our past experience to guide us.
- We can intuitively know when something isn't quite right or doesn't fit an expected pattern.
- We use sight to experience the world visually.
- We communicate by writing and speaking, and engage in dynamic conversations, responding appropriately.
- We can extract information from multiple sources to extend our knowledge

# What is Artificial Intelligence?



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The slide lists common workloads or "areas" of AI. We'll explore each of these workloads in detail later in this course, but for now just point out that in many solutions, the workloads may overlap.







For example, imagine a generative AI solution that uses an agent to process an auto insurance claim. The agent relies on some natural language processing capabilities to make sense of input such as "I want to submit a claim". It may allow users to send a photograph of a damaged vehicle, use computer vision to assess the damage, and apply a machine learning model to predict likely repair costs. The bot might also use information extraction to identify potentially fraudulent claims. Finally, the claims data, including forms, photographs, and other artifacts might be indexed to extract insights and create a searchable knowledge store to help manage future insurance claims.

Ask the students to suggest examples of each workload and provide some examples of your own. For example:

- **Generative AI** is used to create "chat" applications that generate natural language, images, or even programmatic code in response to user "prompts". An example of a generative AI chat application might be an expenses assistant in an organization that can answer employee questions about expense limits and policies.
- **Agents** are built on Generative AI and can initiate actions on behalf of a user. For example, you could extend the expenses chat application described above to automatically compile and submit expense claims.
- **Natural language processing (NLP)** workloads include analyzing text and speech. You could further extend the expenses chat agent to respond verbally to spoken input, or to analyze expense descriptions and determine if they contain named entities (such as a customer name in a claim for corporate entertainment, or a city in a claim for travel expenses.)
- **Computer Vision** workloads include analysis of images and video to identify the objects and people they contain. For example, the expense agent may be able to analyze a web camera input to verify the identity of the employee making a claim; or to recognize a brand logo in an image and determine if it represents an approved supplier.
- **Information extraction** solutions derive semantic information from documents, images, videos, audio, and other modalities. For example, an expense claim application might analyze scanned receipts to extract key fields required for a claim; such as the vendor, date, total amount, tax, and even itemized costs..
- **Machine learning** provides the underlying foundation for all of the above examples; and could also be used

to train a model that analyzes submitted expense claims to identify potential errors or fraudulent claims.

# Principles of responsible AI

	Challenge or Risk	Example
 <b>Fairness</b>	Bias can affect results.	A loan-approval model discriminates by gender due to bias in the data with which it was trained.
 <b>Reliability &amp; safety</b>	Errors may cause harm.	An autonomous vehicle experiences a system failure and causes a collision.
 <b>Privacy &amp; security</b>	Private data could be exposed.	A medical diagnostic agent is trained using sensitive patient data, which is stored insecurely.
 <b>Inclusiveness</b>	Solutions may not work for everyone.	A predictive app provides no audio output for visually impaired users.
 <b>Transparency</b>	Users must trust a complex system.	An AI-based financial tool makes investment recommendations – what are they based on?
 <b>Accountability</b>	Who's liable for AI-driven decisions?	An innocent person is convicted of a crime based on evidence from facial recognition – who's responsible?

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## Principer för ansvarsfull AI

### Fairness (Rättvisa)

AI-system måste behandla alla lika. Bias (partiskhet) i träningsdata kan leda till diskriminering, som när ett lånemodell missgynnar kvinnor.

### Reliability & Safety (Tillförlitlighet och säkerhet)

AI måste fungera säkert och pålitligt. Ett fel i ett autonomt fordon kan leda till allvarliga olyckor.

### Privacy & Security (Integritet och säkerhet)

Användarnas data måste skyddas. Om känsliga patientdata lagras osäkert, finns risk för allvarliga intrång.

### Inclusiveness (Inkluderande design)

AI-lösningar ska fungera för alla. Exempelvis bör appar ha funktioner för synskadade, annars utesluts vissa användare.

### Transparency (Transparens)

Användare ska förstå hur AI fungerar. Om en AI ger finansiella råd utan att förklara grunderna, väcker det misstro.

### Accountability (Ansvar)

Det måste vara tydligt vem som ansvarar för AI-beslut. Till exempel, vem bär skulden om en oskyldig döms på grund av AI-baserad ansiktsigenkänning?

Dessa principer är viktiga för att säkerställa att AI används på ett etiskt och samhällsansvarigt sätt.

At Microsoft, AI software development is guided by a set of six principles for responsible AI.

Use the summaries below to relate these to the challenges and risks on the previous slide.

### 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 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.

Azure Machine Learning includes the capability to interpret models and quantify the extent to which each feature of the data influences the model's prediction. This capability helps data scientists and developers identify and mitigate bias in the model.

### **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.

AI-based software application development must be subjected to rigorous testing and deployment management processes to ensure that they work as expected before release.

### **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.



# Get started with Microsoft Foundry

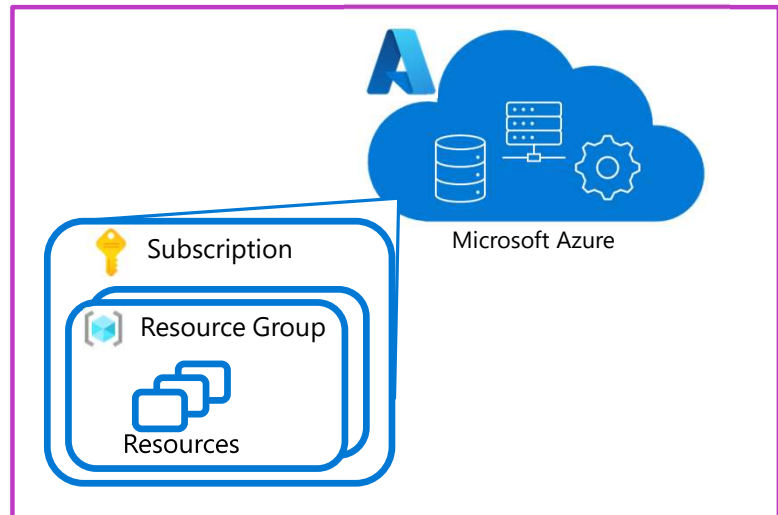
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The goal of this topic is to introduce some fundamental, high-level concepts; which we'll explore in greater depth later in the course. Don't spend too much time getting into the details here.

# Microsoft Azure basics

Microsoft's Azure cloud platform provides scalable and reliable:

- Data storage
- Compute
- Tools



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Bilden visar grunderna i Microsoft Azure – en molnplattform som erbjuder skalbar och tillförlitlig **datalagring**, **beräkningskapacitet** (compute) och **tjänster**.

Arkitekturen i Azure är hierarkiskt uppbyggd:

**Subscription (Prenumeration)** är grunden för åtkomst och fakturering. Den innehåller resurser och definierar användarbehörigheter.

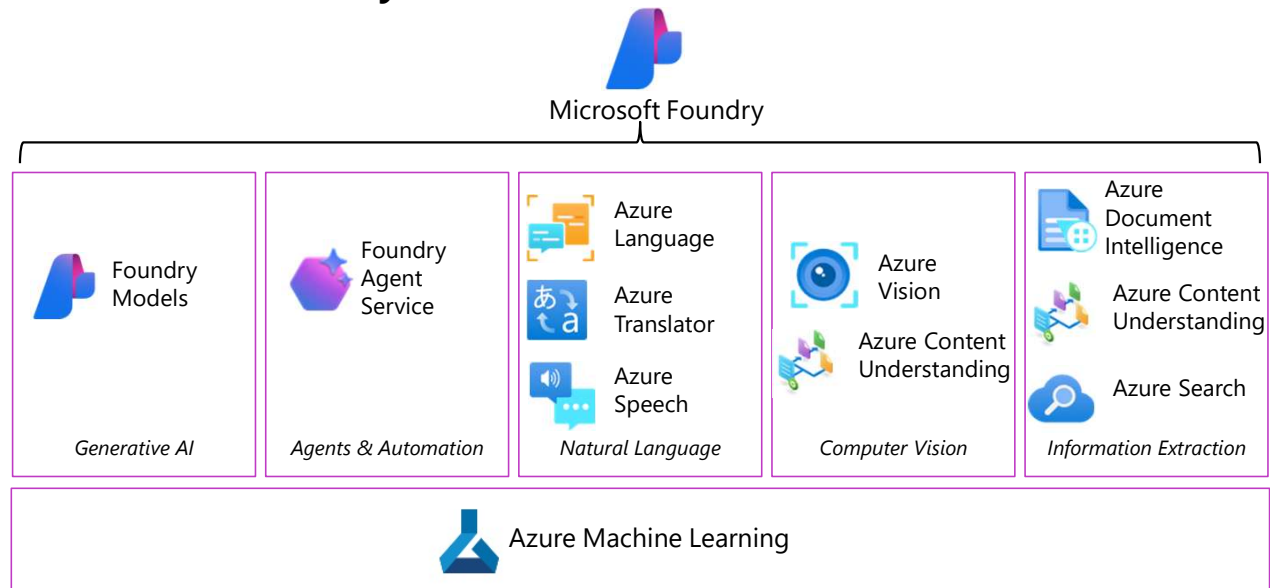
**Resource Group** är en logisk container inom en prenumeration som samlar relaterade resurser (t.ex. databaser, virtuella maskiner) för enklare hantering och struktur.

**Resources** är de faktiska tjänsterna du använder, som t.ex. en virtuell maskin, lagringskonto eller AI-tjänst.

Den blå molnikonen representerar Azure-molnet, där resurser körs och lagras. Strukturen gör det lättare att organisera, övervaka och kontrollera kostnader och åtkomst i en molnmiljö.

Ask students about their existing level experience with Azure and cloud services in general, and if appropriate provide a quick demonstration of navigating the Azure portal at <https://portal.azure.com>.

# Microsoft Foundry Tools



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Här är en kort beskrivning av varje AI-tjänst i Microsoft Azure, med 10–20 ord per tjänst:

## Standalone resources for specific services

### Azure Machine Learning service

Bygg, träna och distribuera maskininlärningsmodeller i molnet med full kontroll och skalbarhet.

### Azure OpenAI in Foundry Models

Använder stora språkmodeller som GPT via Azure för avancerad textgenerering och AI-interaktioner.

### Azure AI Foundry Content service

Hanterar innehållsanalys och moderering med hjälp av fördefinierade AI-modeller för text och media.

## Språk och kommunikation

### Azure AI Language service

Utför språkförståelse, nyckelordsanalys och sentimentanalys i naturligt språk.

### Azure AI Translator service

Översätter text mellan flera språk i realtid med hög precision.

### Azure AI Speech service

Omvandlar tal till text och text till tal; inkluderar taligenkänning och röstsyntes.

## Syn och dokumentanalys

### Azure AI Vision service

Analyserar bilder och videor för objekt, text, ansikten och mer.

### Azure AI Face service

Identifierar och analyserar ansikten i bilder för exempelvis verifiering eller demografisk analys.

### Azure AI Document Intelligence service

Extraherar strukturerad data ur dokument, t.ex. fakturor eller formulär.

## Innehåll, sökning och förståelse

### Azure AI Content Understanding service

Identifierar struktur och betydelse i textbaserat innehåll för bättre informationshantering.

### Azure AI Search service

Tillhandahåller AI-förbättrad sökfunktion med semantisk förståelse och kognitiva färdigheter.

## Kombinerad AI-resurs

### Azure AI Services

En generell resurs för flera AI-funktioner, t.ex. språk, bild, tal och beslut, i en gemensam instans.

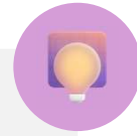
Microsoft Foundry is the overall AI development platform on Azure. It consists of multiple AI tools that developers can use to create AI solutions.

The slide shows commonly used Microsoft Foundry Tools organized into the AI workloads described earlier – however, some services can span multiple workloads; for example, Foundry models can be used to power AI Agents, Azure Content Understanding can be used to analyze images and video, and Azure Search can be used to make knowledge accessible to generative AI solutions and agents.

The Microsoft Foundry Tools we cover in this course are:

- Azure Machine Learning and how machine learning forms the foundation of AI's predictive capabilities.
- Microsoft Foundry and Foundry Models
- Azure Language, including the information extraction, text summarization and classification, question answering, and conversational language understanding
- Azure Speech, including text to speech and speech to text
- Azure Vision
- Azure Document Intelligence
- Azure Content Understanding
- Azure Search

# Knowledge check



- 1 Which is the best description of generative AI?**
  - ☒ Generative AI uses a language model to create original content in response to a prompt
  - ☐ Generative AI is an older form of AI that is being replaced by machine learning.
  - ☐ Generative AI is a complex form of AI that can only be used by specialists such as data scientists.
- 2 An application analyzes scanned business cards to record the names, telephone numbers, and email addresses of business associates. What AI workload best describes this?**
  - ☐ A Generative AI
  - ☒ Information Extraction
  - ☐ Natural Language Processing
- 3 A predictive app provides audio output for visually impaired users. Which principle of Responsible AI is reflected here?**
  - ☐ Transparency
  - ☒ Inclusiveness
  - ☐ Privacy and security

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Här är korta svar, max 10 ord per motivering:

1. Vilken är bästa beskrivningen av generativ AI?

- ☒ **Rätt:** Skapar nytt innehåll baserat på prompt via språkmodell.
- ☒ **Fel:** Generativ AI är en del av modern maskininlärning.
- ☒ **Fel:** Kan användas av många, inte bara specialister.

2. AI-arbetsbelastning för analys av visitkort

- ☒ **Fel:** Skapar inget nytt innehåll.
- ☒ **Rätt:** Extraherar strukturerad information ur bilder/text.
- ☒ **Fel:** Fokus är datautvinning, inte språkförståelse.

3. Ansvarsfull AI – ljud för synskadade

- ☒ **Fel:** Handlar inte om insyn i beslutsfattande.
- ☒ **Rätt:** Gör tekniken tillgänglig för fler användare.
- ☒ **Fel:** Berör inte skydd av personuppgifter.

*Allow students a few minutes to think about the questions; and then reveal the correct answers.*

# Summary



## Get started with AI concepts

- What is AI?
- Common AI workloads
- Principles of responsible AI

## Get started with Microsoft Foundry

- Microsoft Azure basics
- Microsoft Foundry Tools by workload

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# Exercise

## Get started with Microsoft Foundry

In this exercise, you'll create and explore a Microsoft Foundry project.

Start the exercise at:  
<https://github.com/MicrosoftLearning/mslearn-ai-fundamentals/blob/main/Instructions/Exercises/00-exploring-foundry.md>

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**Note:** The applications used in this exercise are based on simple machine learning models with simplified features. However, they're based on real models that were trained and tested using [Azure Machine Learning](#) - a platform for machine learning model development, deployment, and management.

After completing the exercise, ask the students questions to check their understanding. For example; what kind of machine learning is demonstrated in the home rental estimator (regression), seed identifier (multiclass classification), and customer segmentation (clustering) scenarios.