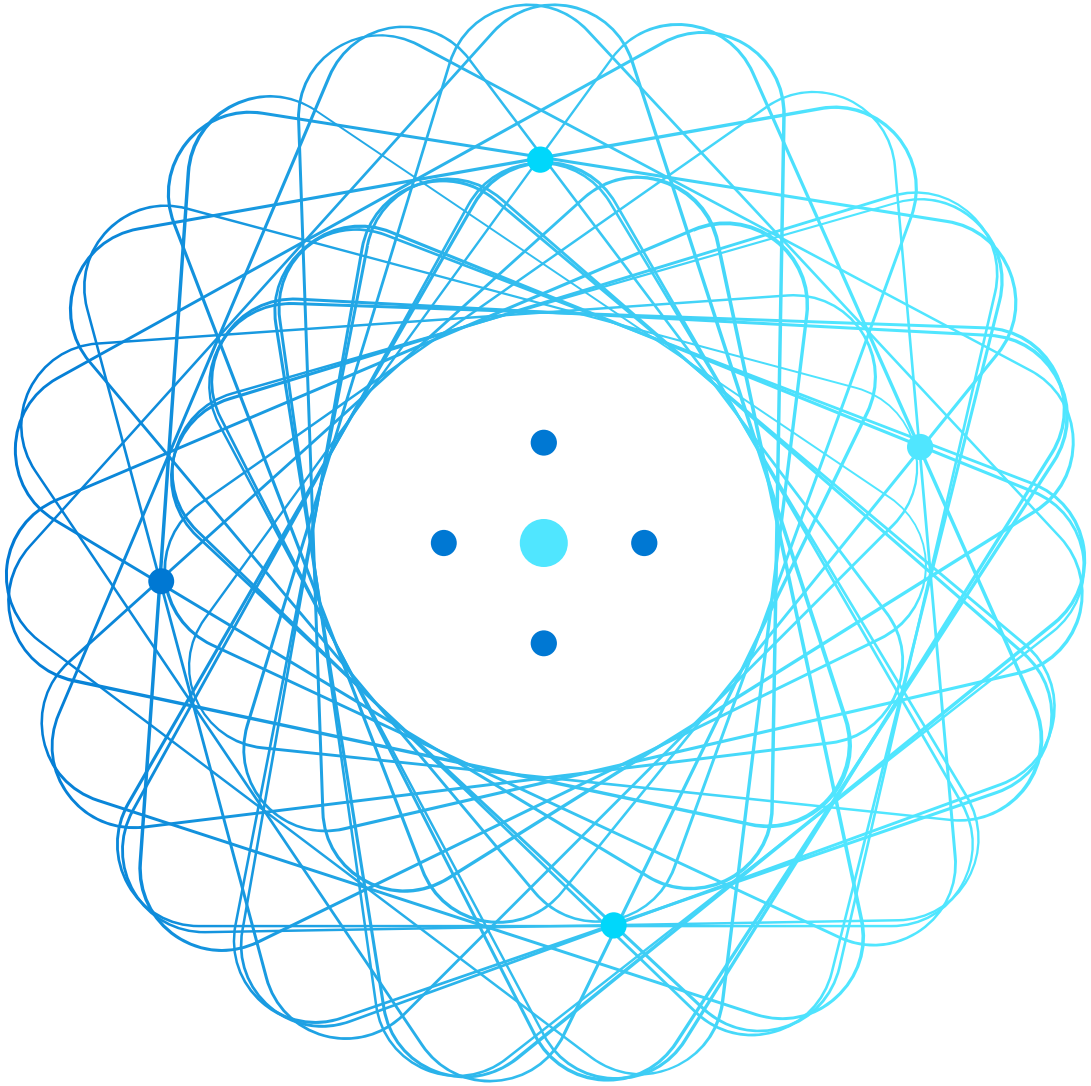
Microsoft Azure

01

Explore Fundamentals of Artificial Intelligence



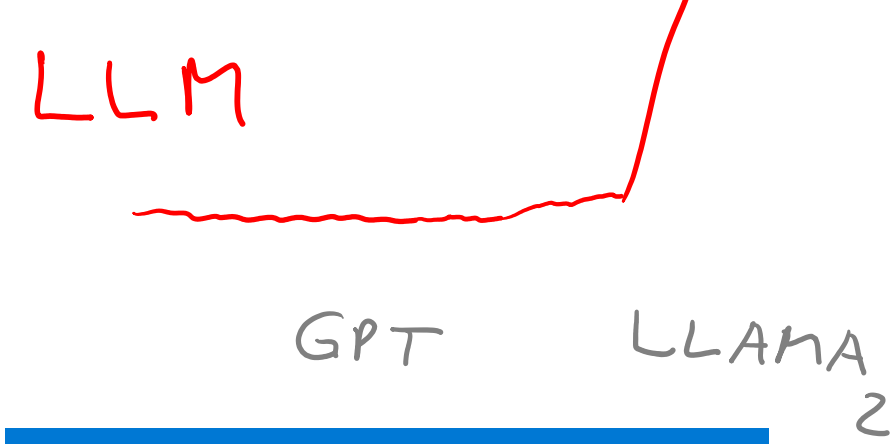
Agenda

Introduction to Artificial Intelligence

Artificial Intelligence in Microsoft Azure

Introduction to Artificial Intelligence

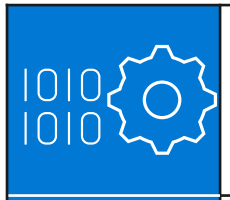
What is Artificial Intelligence?



Software that imitates human capabilities

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

Common Artificial Intelligence Workloads

 Machine Learning	Predictive models based on data and statistics – the foundation for AI
 Anomaly Detection	Systems that detect unusual patterns or events, enabling pre-emptive action
 Computer Vision	Applications that interpret visual input from cameras, images, or videos
 Natural Language Processing	Applications that can interpret written or spoken language, and engage in dialogs with human users
 Knowledge Mining	Extract information from data sources to create a searchable knowledge store

Principles of Responsible AI

Fairness

Reliability & Safety

Privacy & Security

Inclusiveness

Transparency

Accountability

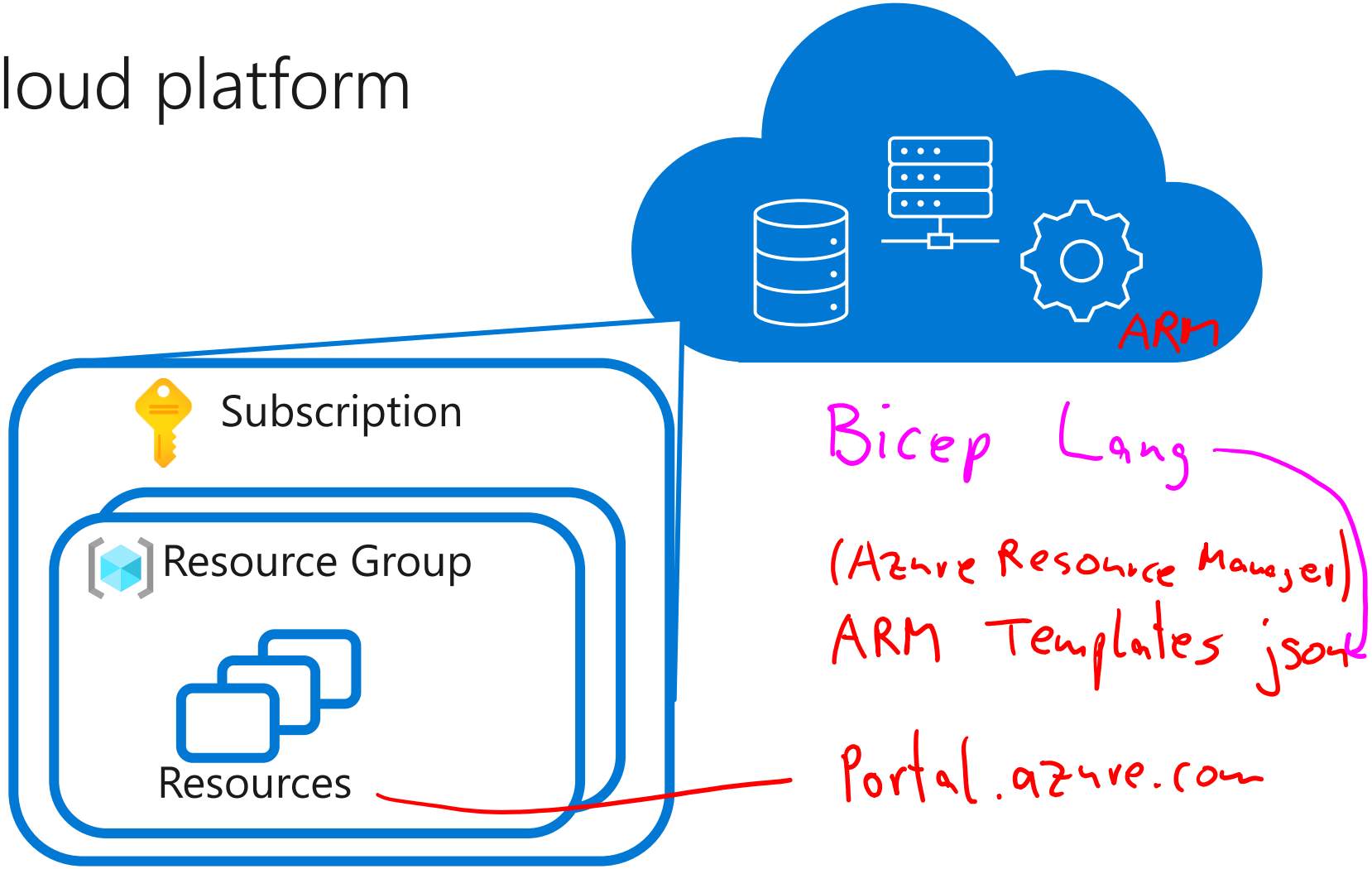
Challenge or Risk	Example
Bias can affect results	A loan-approval model discriminates by gender due to bias in the data with which it was trained
Errors may cause harm	An autonomous vehicle experiences a system failure and causes a collision
Data could be exposed	A medical diagnostic bot is trained using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

Artificial Intelligence in Microsoft Azure

Azure Basics

Scalable, reliable cloud platform

- Data storage
- Compute
- Services



AI Services in Microsoft Azure

Azure Machine Learning

A platform for training, deploying, and managing machine learning models

Cognitive Services

A suite of services with four main pillars: Vision, Speech, Language, Decision

Azure Bot Service

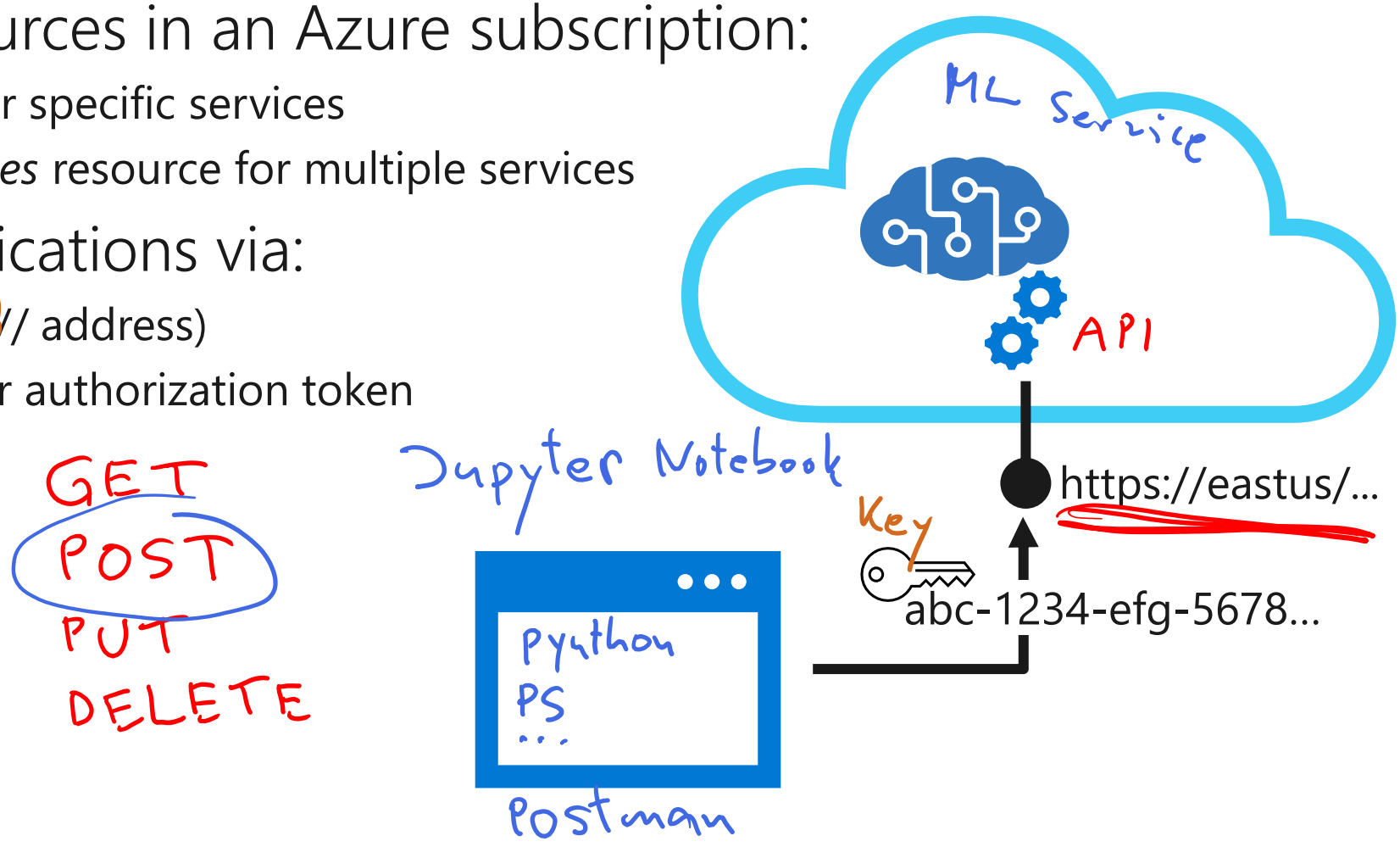
A cloud-based platform for developing and managing conversational bots

Azure Cognitive Search

Data extraction, enrichment, and indexing for intelligent search and knowledge mining

Cognitive Services

- AI application resources in an Azure subscription:
  - Standalone resources for specific services
  - General *Cognitive Services* resource for multiple services
- Consumed by applications via:
  - A REST endpoint (https:// address)
  - An authentication key or authorization token



Lab: Explore Cognitive Services

Content Safety

In this lab, you will explore the ~~Anomaly Detector~~ cognitive service, which analyzes data over time to detect any unusual values.

1. Start the virtual machine for this lab
   or go to the exercise page at https://microsoftlearning.github.io/AI-900-AIFundamentals/instructions/01-module-01.html
2. Follow the instructions to complete the exercise
   Use the Azure subscription provided for this lab

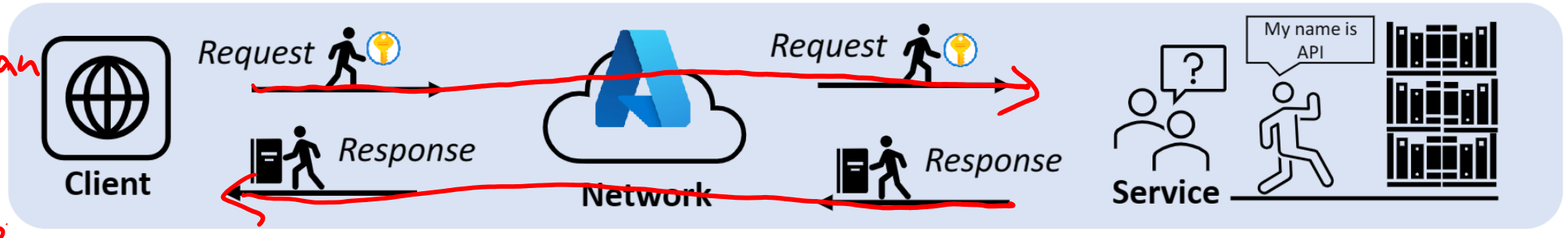
How does an Azure API work?

1 The client is any software application that runs on your phone, computer, or other smart devices. When you use the client, it sends a request.

Imagine a visitor who walks to a librarian's desk holding a key. The key is like a pass at the library, allowing the visitor to borrow a book. The visitor wants to make a request such as "I want Book A" or "I want a prediction of the weather".

2 Requests are sent through a network to an endpoint. The Application Programing Interface (API) at that endpoint performs a service to fulfill the request and send back a response.

The endpoint is like the library information desk. An API is the librarian who gets a request "I want Book A", goes to get Book A.



postman

App Studio

3 An AI-informed API can fulfill requests such as predictions and send back a response. The client receives the response.

Azure AI services consist of a trained machine learning models that behave like a function – accepting one or more input values and generating a predicted output based on probability.

An AI-informed librarian could get a request "I want a prediction of the weather" and goes to get a prediction that the weather will be sunny. The visitor takes that response back to the client.

Learn more about:
[Introduction to Azure AI]
[Azure's visual tools for Machine Learning]
[Azure's Computer Vision solutions]
[Azure's Natural Language Processing solutions]

Review

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
- ❑ Azure Bot Service
- ❑ Cognitive Services

You are designing an AI application that uses images to detect cracks in car windshields and warn drivers when a windshield should be repaired or replaced. What AI workload is described?

- ❑ Computer Vision
- ❑ Anomaly Detection
- ❑ Natural Language Processing

A predictive app provides audio output for visually impaired users. Which principle of Responsible AI is reflected here?

- ❑ Transparency
- ❑ Inclusiveness
- ❑ Fairness

Summary

Introduction to Artificial Intelligence

- What is Artificial Intelligence?
- Common Artificial Intelligence Workloads
- Principles of Responsible AI

Artificial Intelligence in Microsoft Azure

- Azure Basics
- AI Services in Microsoft Azure
- Cognitive Services

Microsoft Azure