AWS Academy

WEBINAR

Unlock the Power of Generative AI: An AWS Academy Webinar for Educators

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AWS Academy

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Session Overview

Sections

1. Importance of AI and AI Landscape
2. Generative AI on AWS
3. AWS Academy Curriculum and generative AI alignment

Demonstration

1. Create an app from scratch with PartyRock

Why AI matters

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Adoption of Artificial Intelligence

Artificial Intelligence (AI) has accelerated, and companies around the world have accelerated their AI adoption initiatives.

Source: Plurasight 2024

AI and generative AI skills gap

- 90% of executives don't completely understand their team's AI skill and proficiency

81%

of IT professionals feel confident they can integrate AI into their roles right now –
but only 12% have significant experience working with AI

Both executives and IT professionals believe investing in talent, training, and culture is the first step organizations should take to prepare for emerging AI technology and tools.

But only

40%

Of organizations have formal structured training and instruction for AI

95%

of executives and 94% of IT professionals believe AI initiatives will fail without staff who can effectively use AI tools.

Plurasight | AI Skills Report 2024

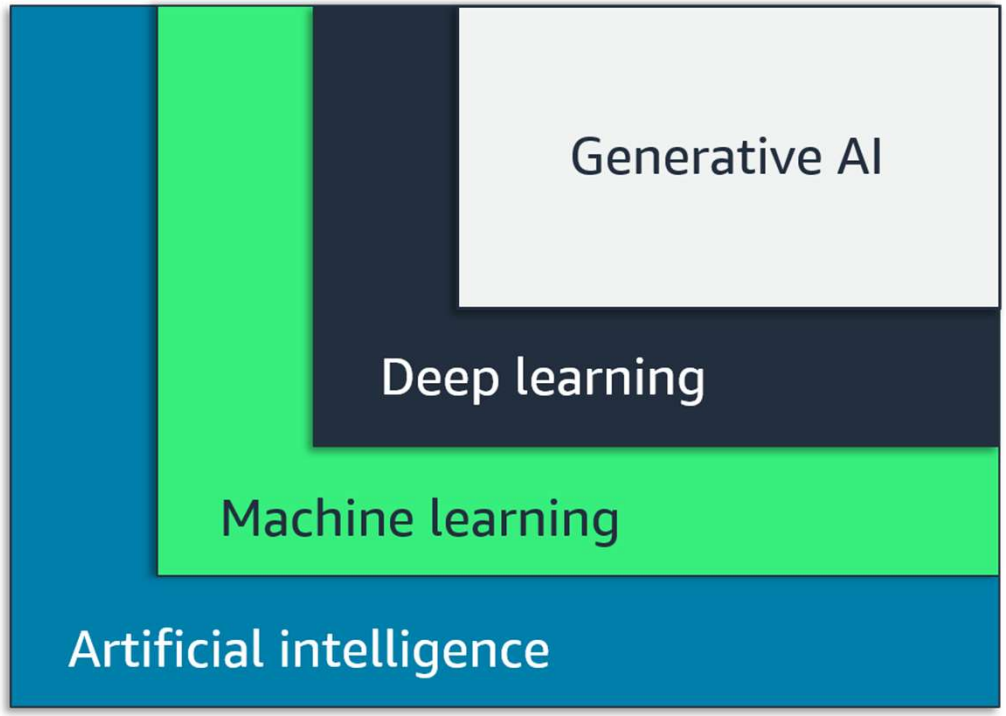
What is AI, Machine Learning and generative AI ?

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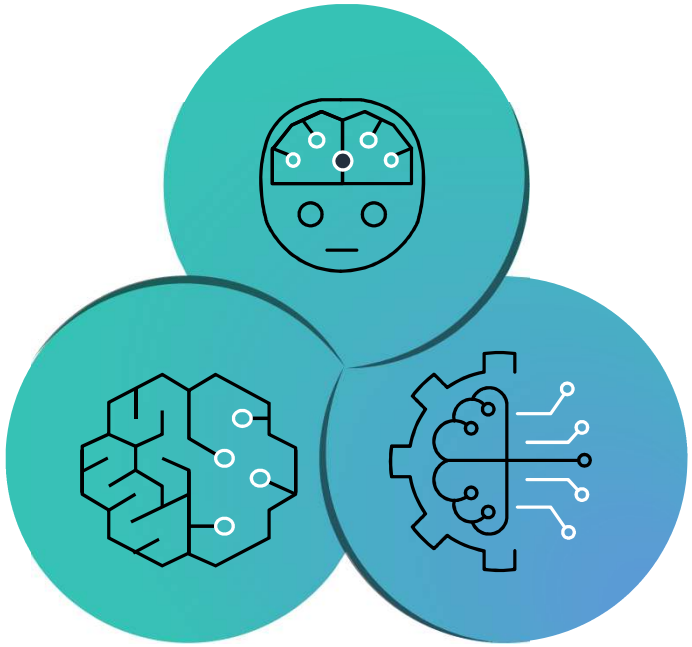
AI Landscape

Generative AI sits within the broader landscape of artificial intelligence (AI)



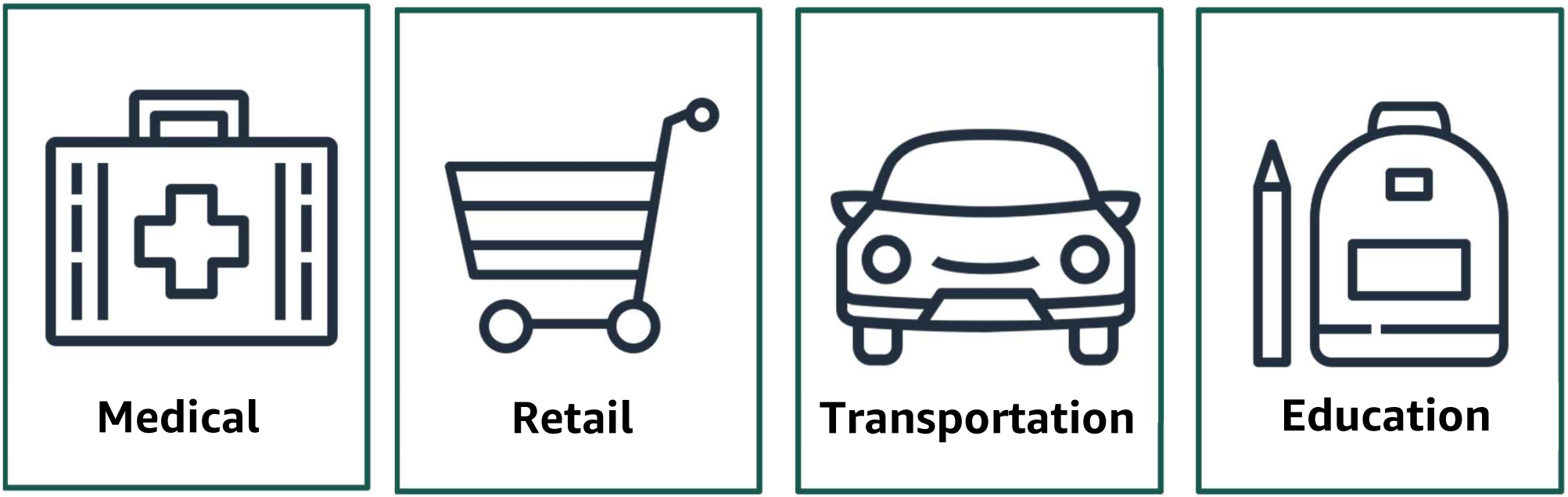
AI Definition

AI is about building machines that can perform tasks that a human would typically perform.

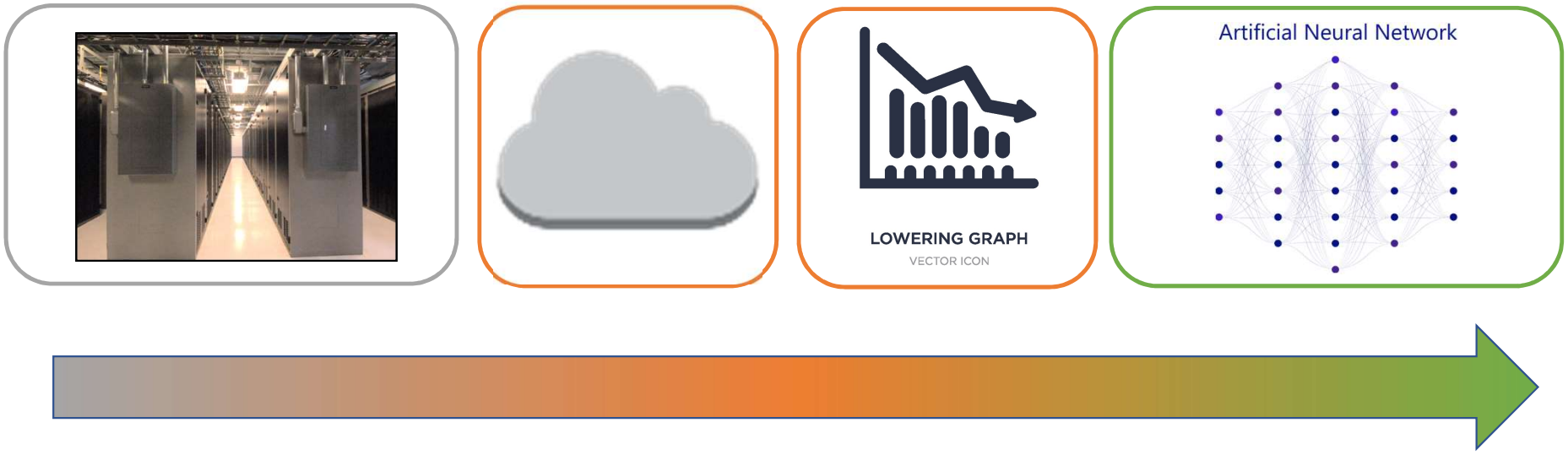


AI Impact

AI is a disruptive technology



ML and technology advancements



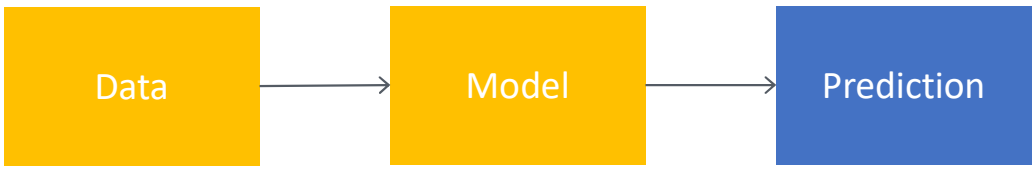
Traditional computing

Cloud computing and Moore's law

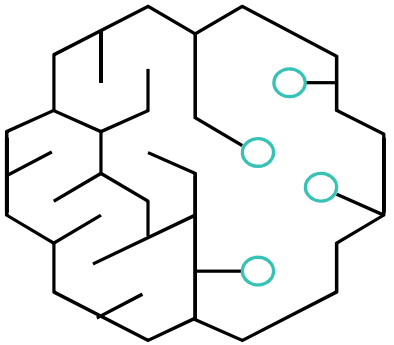
Modern machine learning

Machine Learning Definition

Machine learning is the scientific study of algorithms and statistical models to perform a task using inference instead of instructions.

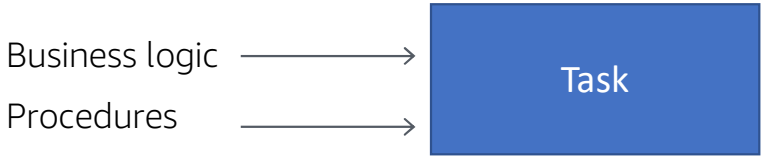


Machine learning flow

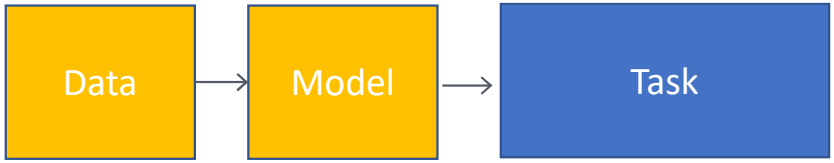


When to use machine learning?

Classical programming approach



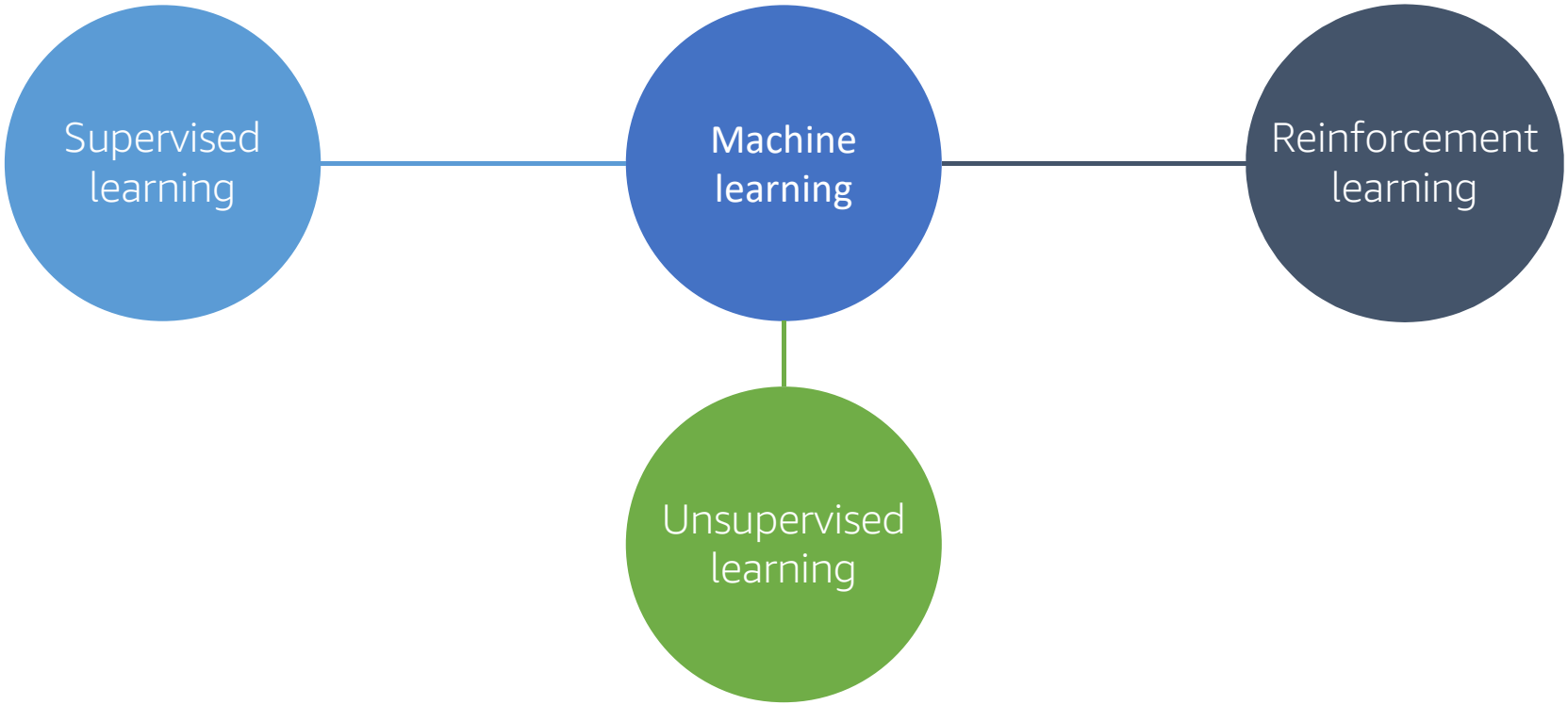
Machine learning approach



Use machine learning when you have:

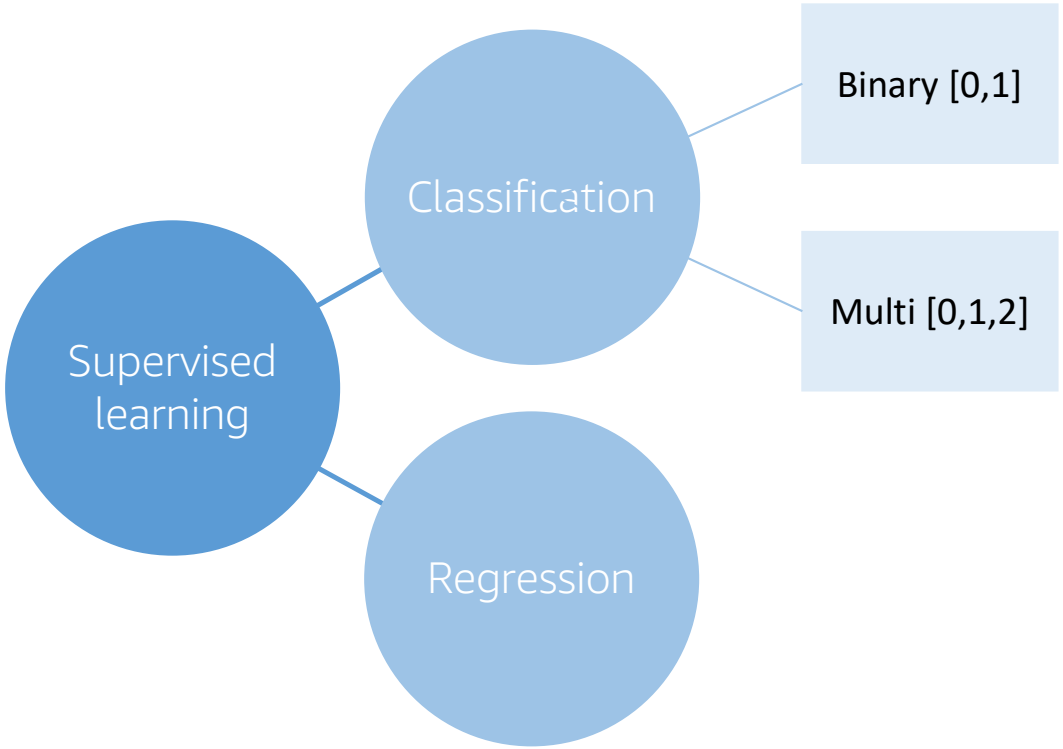
- ✓Large datasets, large number of variables
- ✓Lack of clear procedures to obtain the solution
- ✓Existing machine learning expertise
- ✓Infrastructure already in place to support ML
- ✓Management support for ML

Types of machine learning



Supervised learning

Learn by identifying patterns in data that is **already labeled**.

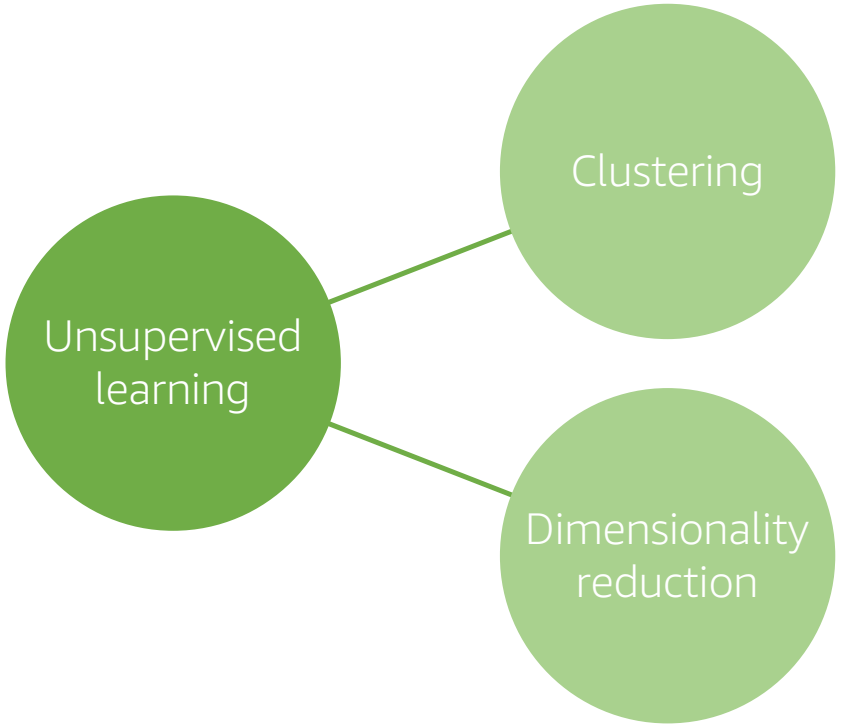


- Fraud detection
- Image recognition
- Customer retention
- Medical diagnostics
- Personalized advertising

- Product sales prediction
- Weather forecasting
- Market forecasting
- Population growth prediction

Unsupervised learning

The machine must uncover and **create the labels** itself.



- Product recommendations
- Customer segmentation
- Targeted marketing
- Medical diagnostics

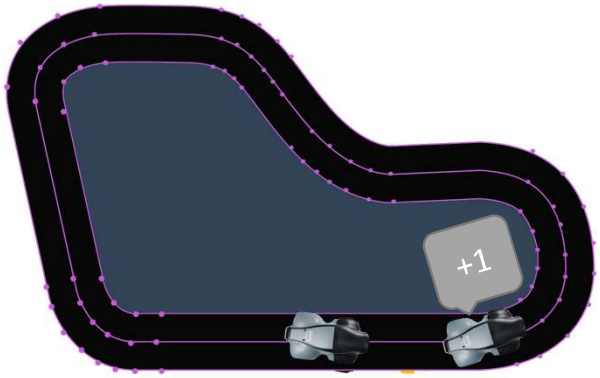
- Visualization
- Natural language processing
- Data structure discovery
- Gene sequencing

Reinforcement learning

Learning through trial and error.

Reinforcement learning

- Game AI
- Self-driving cars
- Robotics
- Customer service routing

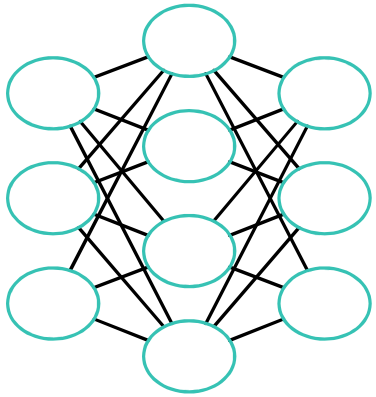


AWS DeepRacer

Best when the desired outcome is known but the exact path to achieving it is not known.

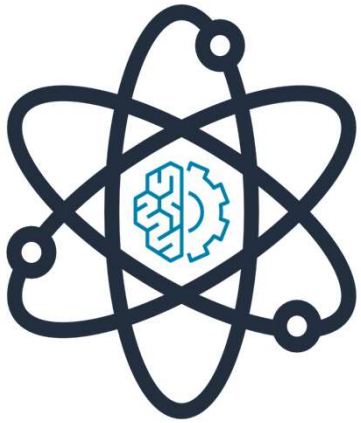
Deep Learning Definition

Deep learning is an artificial intelligence technique that enables computers to learn and understand complex patterns from large amounts of data.



Generative AI Definition

Generative AI is a type of artificial intelligence that can create new content and ideas, including conversations, stories, images, videos, and music.



How generative AI differs from traditional AI

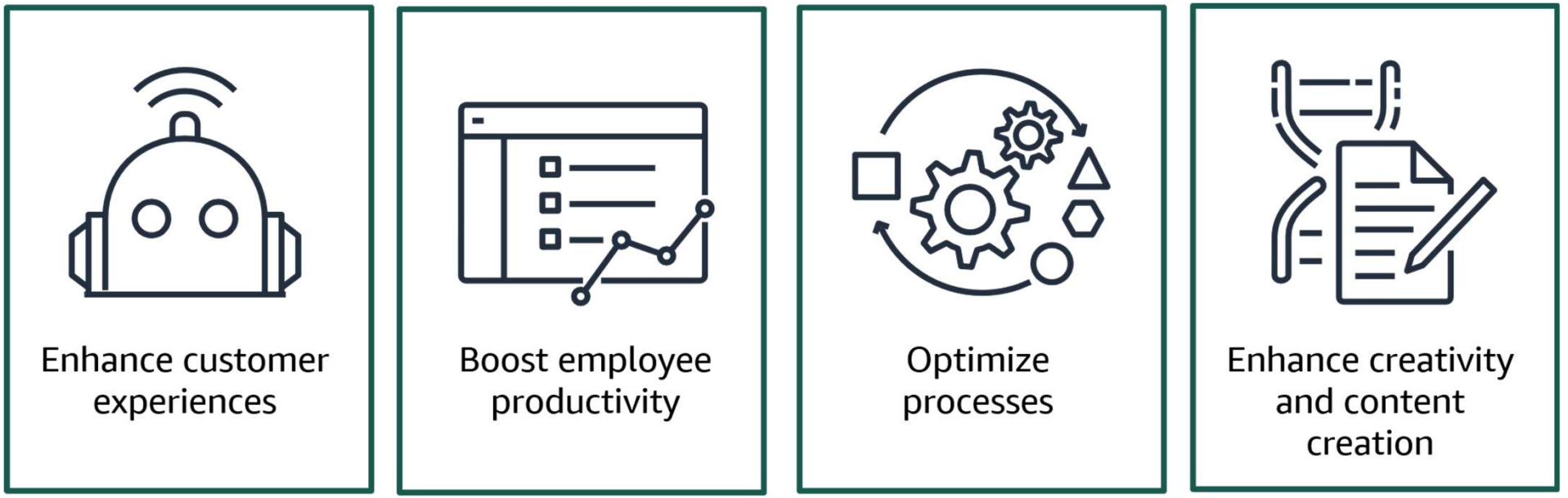
Traditional ML

- A model can handle one type of data.
- Each model can perform only one task.
- Models must be carefully trained on the data that you provide.

Generative AI

- Models are pretrained on massive amounts of general domain data.
- Models can perform multiple tasks.
- Models can actually generate content.

Generative AI Benefits

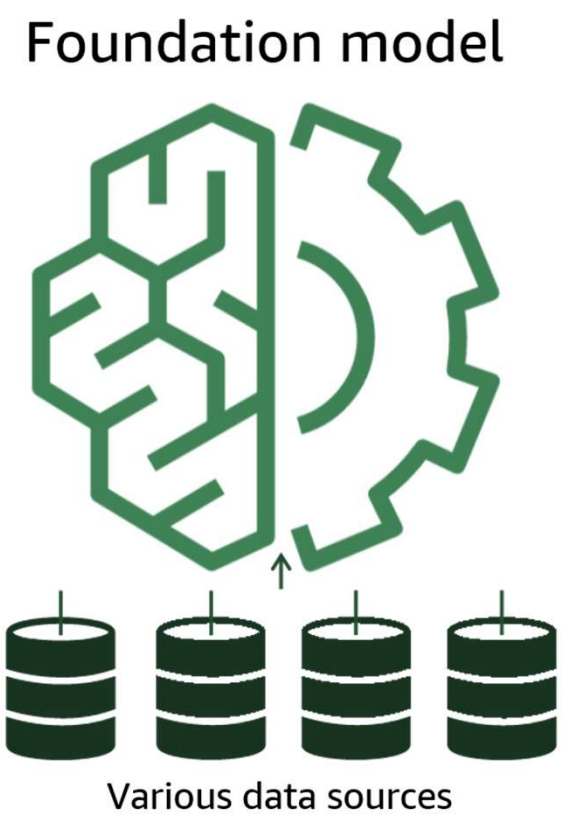


Generative AI on AWS

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What are FMs?





Text generation



Data summarization



Information extraction



Q&A responses



Chatbot interactions

What tasks can foundation models do?



Text generation



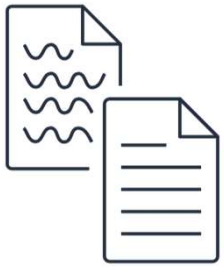
Q&A



Sentiment analysis



Text summarization



Search



Code generation



Image generation



Image classification



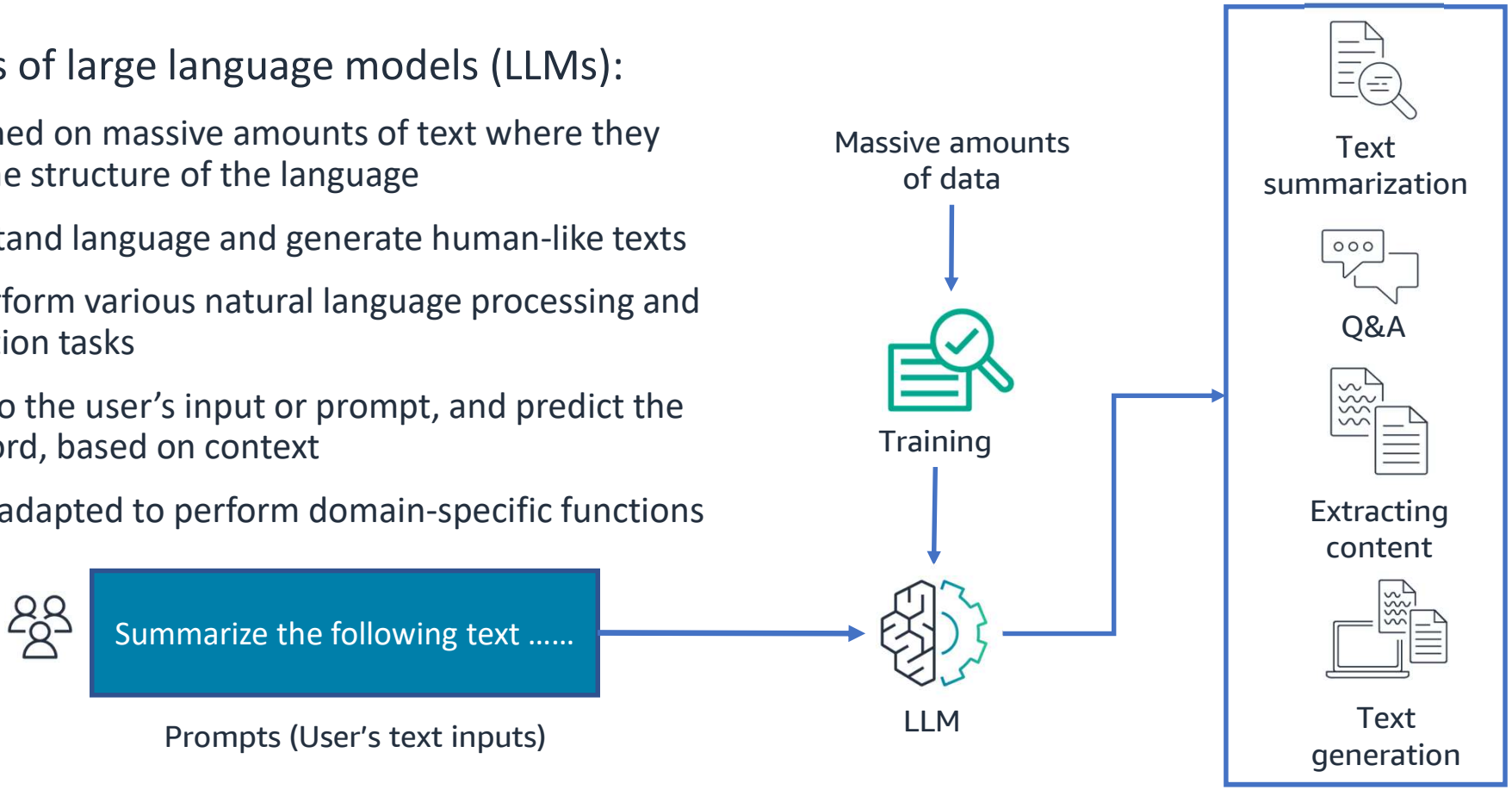
Audio generation



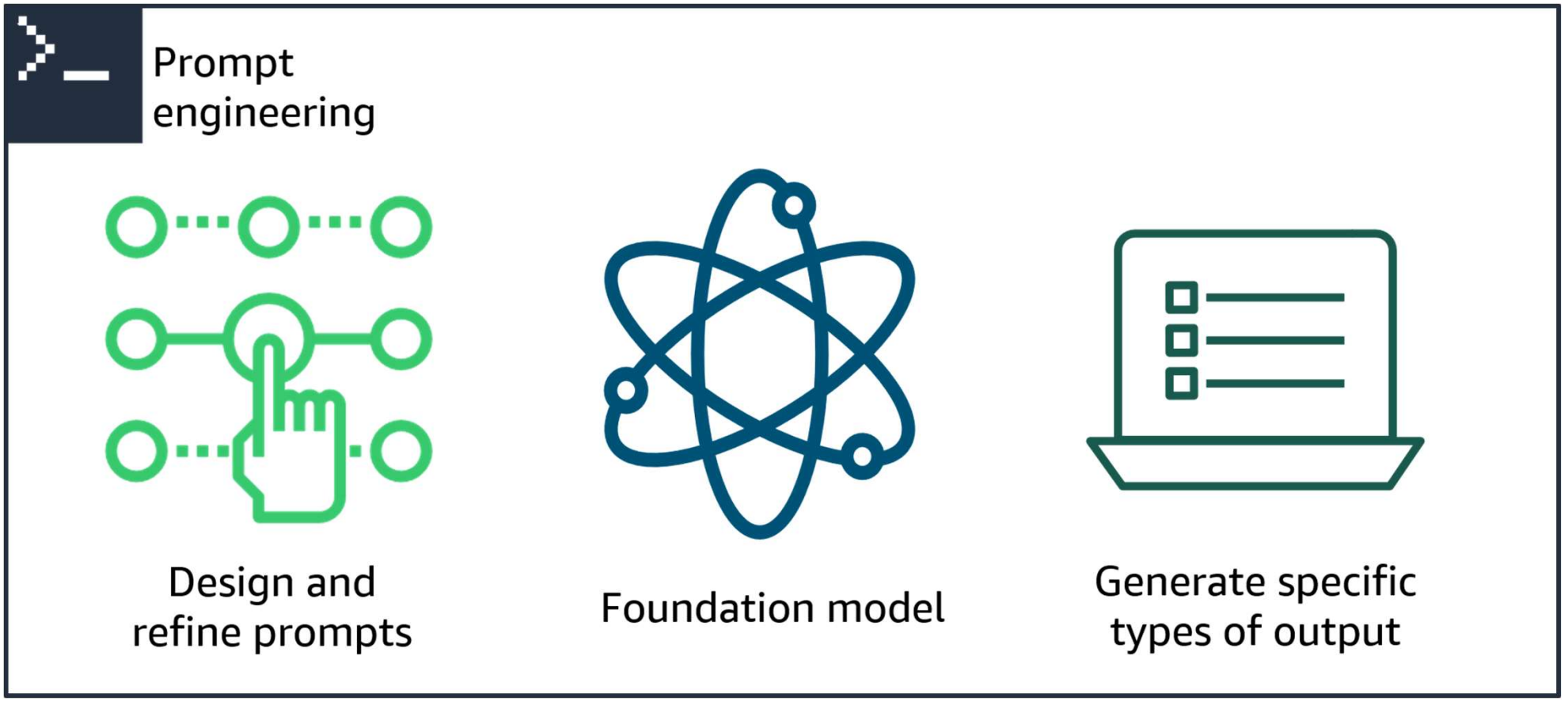
Video generation

What are LLMs?

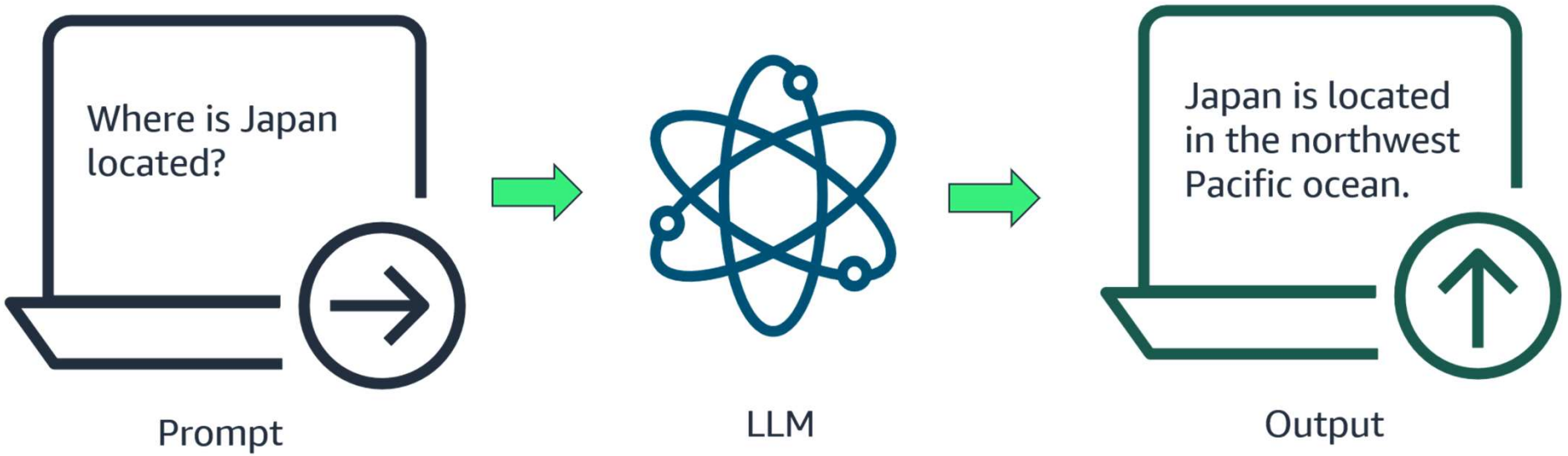
- Features of large language models (LLMs):
  - Pretrained on massive amounts of text where they learn the structure of the language
  - Understand language and generate human-like texts
  - Can perform various natural language processing and generation tasks
  - Adapt to the user's input or prompt, and predict the next word, based on context
  - Can be adapted to perform domain-specific functions



What is prompt engineering?



Example of a prompt



Structure of a prompt

Prompt



Instruction

Instructions: Summarize the following restaurant review.



Context

Restaurant: Luigi's; Location: Naples, Italy; Specialty: Pasta



Input

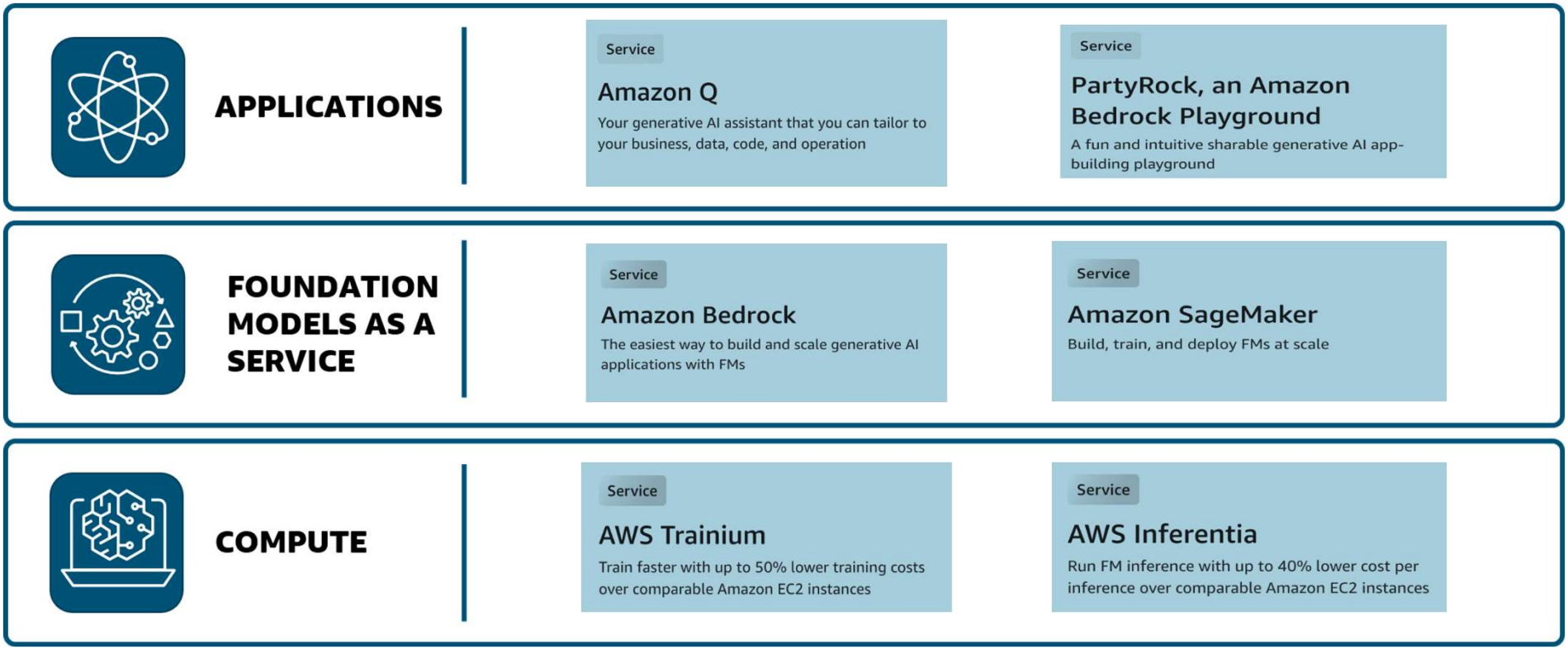
Review: We ordered the tagliatelle and mozzarella caprese. The tagliatelle were a work of art—the pasta was just right and the tomato sauce with fresh basil was perfect. The caprese was OK but nothing out of the ordinary. Service was slow at first but overall it was fine. Other than that, Luigi's was a great experience!



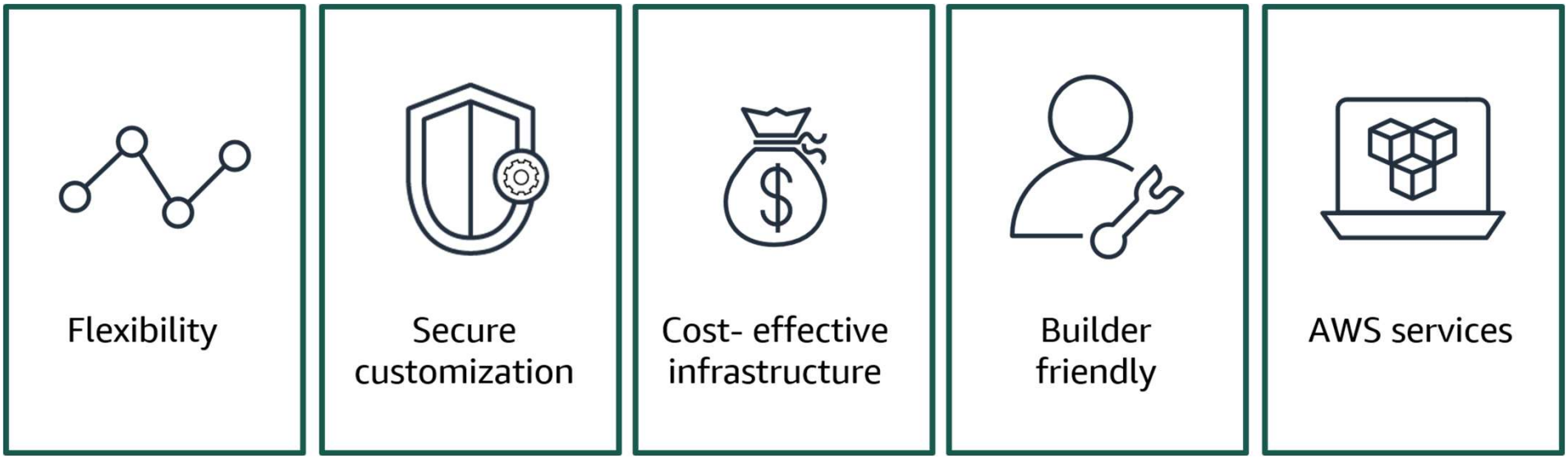
Output

Summary: Luigi's is a great Italian restaurant with delicious pasta and good service.

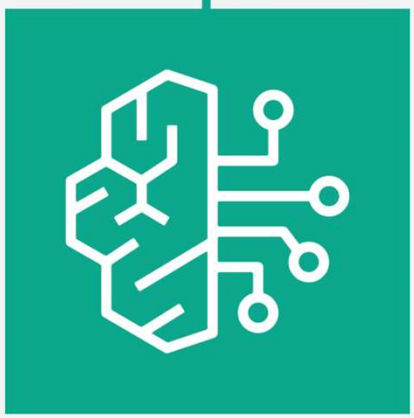
Generative AI on AWS



Unlock business value with generative AI



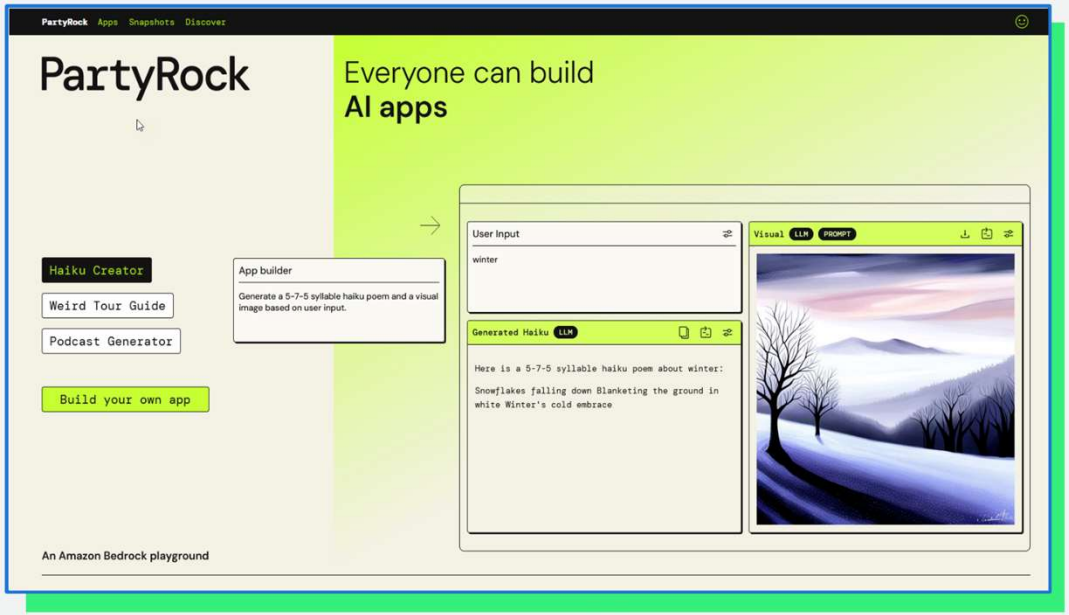
Amazon Bedrock



Amazon Bedrock

- Amazon Bedrock is a fully managed service that makes high-performing FMs.
- FMs are available for your use through a unified API, which helps to reduce maintenance work.
- Amazon Bedrock offers a broad set of capabilities to build generative AI applications with security, privacy, and responsible AI.
- You can customize FMs with your own data and deploy them into your applications without having to manage any infrastructure.

What is PartyRock ?



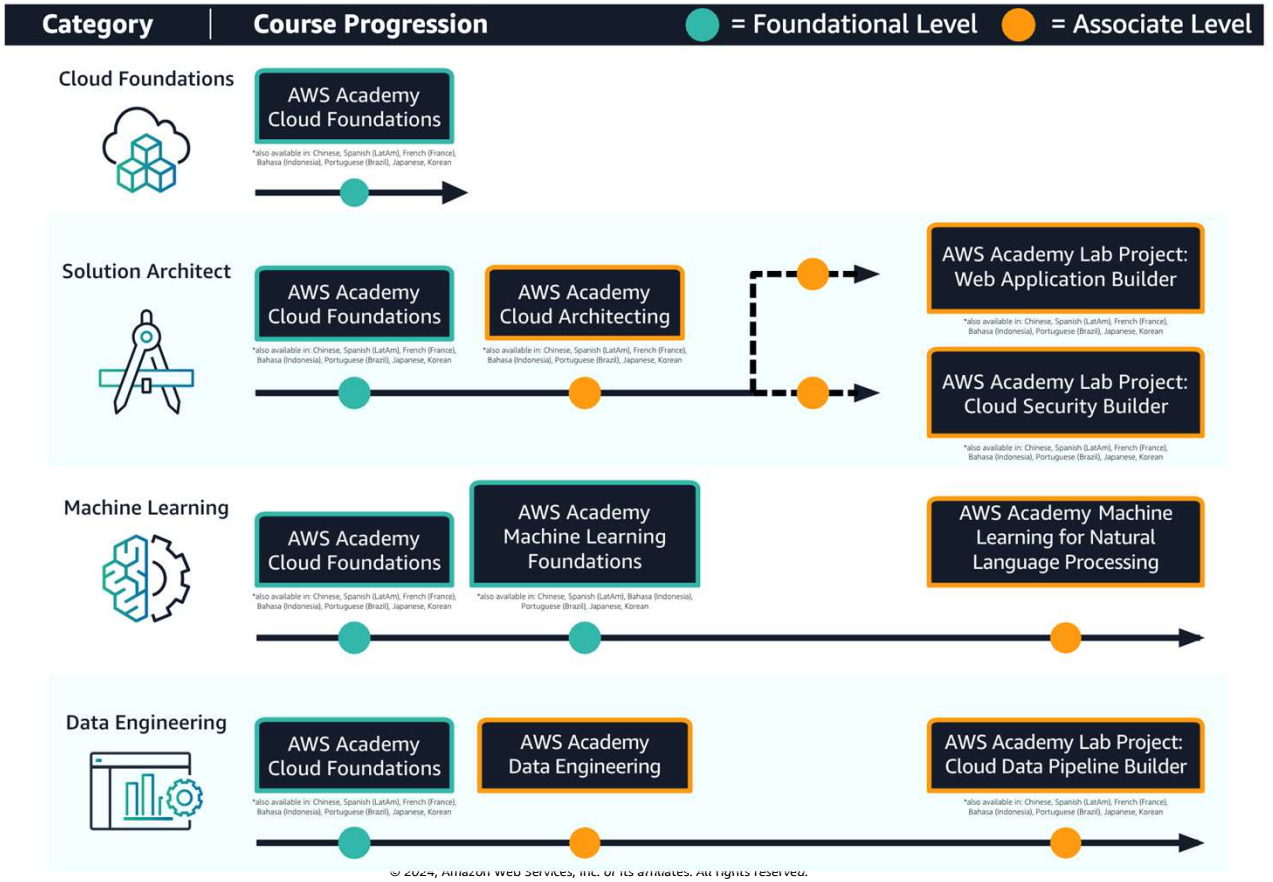
- **PartyRock** is an **Amazon Bedrock playground** that anyone can use to build a **generative AI** application using **no** coding skills.
- PartyRock uses a concept called **prompt engineering** to help create the application.
- PartyRock is not intended for users **under 18**. For more information, see PartyRock.

AWS Academy & Generative AI aligned curriculum

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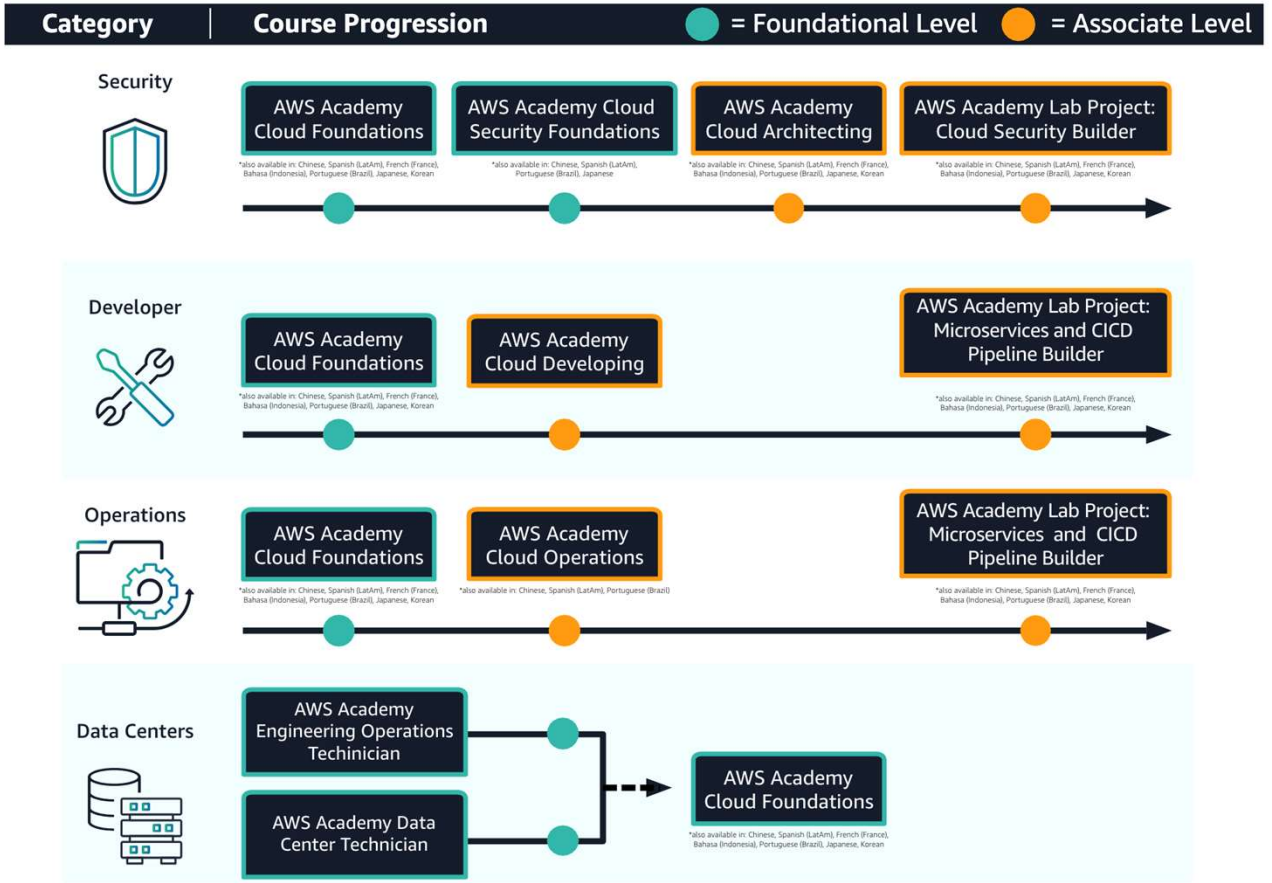
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AWS Academy Course Catalogue



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AWS Academy Course Catalogue



AWS Academy Generative AI Aligned Curriculum

AWS ACADEMY MACHINE LEARNING FOUNDATIONS

Description

AWS Academy Machine Learning Foundations introduces students to the concepts and terminology of Artificial Intelligence (AI), machine learning, and generative AI. By the end of this course, students will be able to select and apply machine learning services to resolve business problems. They will also be able to label, build, train, and deploy a custom machine learning model through a guided, hands-on approach. In addition, students will get a first experience working with generative AI through a guided, hands-on lab.

Course Objectives

Upon completion of this course, students will be able to:

- Describe machine learning (ML)
- Implement a machine learning pipeline using Amazon SageMaker
- Use managed Amazon ML services for forecasting
- Use managed Amazon ML services for computer vision
- Use managed Amazon ML services for natural language processing
- Identify how Amazon ML services for generative AI are used

Duration

Approximately 23 hours when delivered synchronously by an educator.

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AWS Academy Generative AI Aligned Curriculum

AWS ACADEMY MACHINE LEARNING FOR NATURAL LANGUAGE PROCESSING

Description

AWS Academy Machine Learning for Natural Language Processing (NLP) is a follow-up course to AWS Academy Machine Learning Foundations. The course is at an intermediate technical level and is appropriate for students who are pursuing careers that require machine learning (ML) knowledge.

Curriculum objectives

Upon completion of this course, students will be able to do the following:

- Describe NLP.
- Understand how to apply the ML pipeline to NLP.
- Implement text extraction to obtain data from webpages.
- Create a solution for a sentiment analysis business problem.
- Use Amazon Comprehend to implement a topic modeling solution.
- Build a solution that uses AWS services to transcribe and translate text from multimedia.
- Build a solution using a combination of algorithms and Amazon Machine Learning (Amazon ML) services.
- Describe generative AI and large language models (LLMs).
- Identify use cases to use generative AI and LLMs.
- Explain how to use LLMs with AWS generative AI services.

Duration

Approximately 20 hours. The course is designed to be delivered over one semester. Actual delivery times vary depending on the format. This course must be delivered over a period of at least 4 weeks.

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Q&A

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Additional Generative AI Resources

Discover more with AWS Training and Certification

AWS Skill Builder

- Generative AI for Executives
- Building Language Models on AWS
- Foundations of Prompt Engineering

AWS Educate

- Introduction to Generative Artificial Intelligence
- Introduction to Amazon Q Developer
- Using Amazon Q Developer

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Create app with PartyRock – Baby Name Recommender

- Steps -> https://partyrock.aws/ and sign in with your credentials
- Click on **Build your own app.**
- Click on **Start from an empty app**.
- Click on **Create Widget** to add **a static text widget** to describe the app. For example, **this app recommends baby names based on the baby's date of birth, gender, and culture** as content.
  - Click on **Create Wid**get to add a user widget for **Date of Birth**
    - Widget Title – **Date of Birth**
    - Default Value – **Today's date**
  - Click on **Create Widget** to add a user widget for **Gender**
    - Widget Title – **Gender**
    - Default Value – **Female/Male**
  - Click on **Create Widget** to add a user widget for **culture**
    - Widget Title – **Culture**
    - Default Value – **American/Japanese**

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PartyRock app contd.

- Click on **Create Widget** to add an **AI-powered Text Generation** for Recommended Names
  - Widget Title **– Recommended Names**
  - Model **– Claude 3 Sonnet**
  - Prompt **– List of recommended @Culture baby names based on @Date of birth and @Gender**
- Re-arrange widgets
- Execute to get a list of recommended baby names
- Click on **Create Widget** to add an **AI-powered Chatbot** for Detailed meaning of a name.
  - Widget Title **– Detailed meaning of a selected name**
  - Model **– Claude 3 Sonnet**
  - Initial Message **– I provide a detailed meaning of the selected baby name**
  - **Prompt – Provide detailed meaning.**

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Thank You!

Please complete the EVENT Survey using the link below:

https://app.smartsheet.com/b/form/3437adf0713546a4aebe4e0f16978f5e?Event%20ID=EVNA77

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Demos – Internal use

- Demo: Explore an FM and Use Prompt Engineering in a Notebook
  - https://awsacademy.instructure.com/courses/64709/modules/items/6980754
- Demo: Creating a Linear Regression Model Using Amazon CodeWhisperer
  - https://awsacademy.instructure.com/courses/64709/modules/items/6980751
- Demo: Amazon Bedrock Overview
  - https://awsacademy.instructure.com/courses/64706/modules/items/6961426
- Demo: Use LLMs to Perform NLP Tasks
  - https://awsacademy.instructure.com/courses/64706/modules/items/6961426