

CYBER.ORG
THE ACADEMIC INITIATIVE OF THE CYBER INNOVATION CENTER

Introducing AI Fundamentals

Presented by:
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Agenda

- 1 What is AI Fundamentals?
- 2 Overview of the Course and Resources
- 3 Demo Lessons and Lab
- 4 Preview Case Study
- 5 Questions and Closure



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Supplies Needed for this PD

- Scratch paper
- Pen/pencil
- Range logins (provided)
- Dual monitor (recommended)



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Session Objectives

- **Gain** a comprehensive understanding of CYBER.ORG's AI Fundamentals course by identifying the essential content to allow you to teach artificial intelligence concepts effectively.
- **Apply** strategies for teaching AI through experiencing a lesson and lab from AI Fundamentals.
- **Define** AI and identify how it can be used to generate content from text to audio tracks.



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Key Words and Definitions

- **Artificial Intelligence** – a computing system or program that can simulate human capabilities, such as analysis, learning, and adapting, based on a predetermined set of rules or collection of data
- **Generative AI (GenAI)** – a subset of AI that generates new content (text, images, music, code, etc.) using massive datasets
- **Waveform** – a visual representation of sound waves' amplitude (pitch), over time
- **Spectrogram** – a visual representation of sound that shows frequency and amplitude over time using a combination of gradients and color intensity



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What is AI Fundamentals?



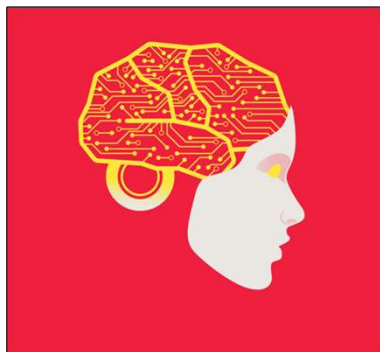
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AI Fundamentals Overview

- AI Fundamentals is a high school course for grades 9-12 that introduces students to the principles, applications, and effects of artificial intelligence usage today.
- Emphasis is placed on responsible and ethical AI use, digital citizenship, and real-world applications across professional industries.
- The course is benchmarked to the topics and competencies reflected in the ISACA AI Fundamentals Credential and will incorporate CYBER.ORG's updated Learning Standards.
 - Current CYBER.ORG Learning Standards are listed.



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AI Fundamentals Unit Topics

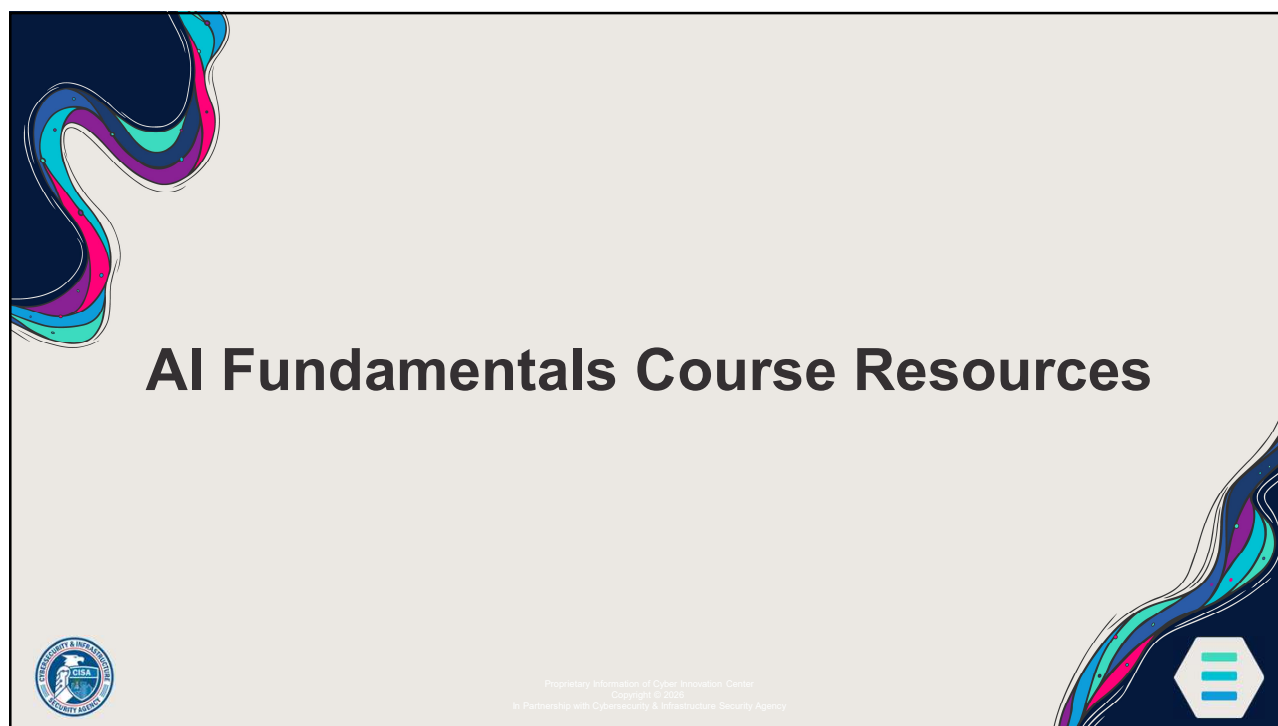
- 9 units meant to cover a full year:
 - Foundations of Artificial Intelligence (AI)
 - Data, Algorithms, and Solutions
 - Machine Learning
 - Human-AI Interaction and Design Thinking
 - Ethics and Society with AI
 - Generative AI
 - Applied AI and Digital Citizenship
 - Cybersecurity and AI
 - Monitoring and Improving AI



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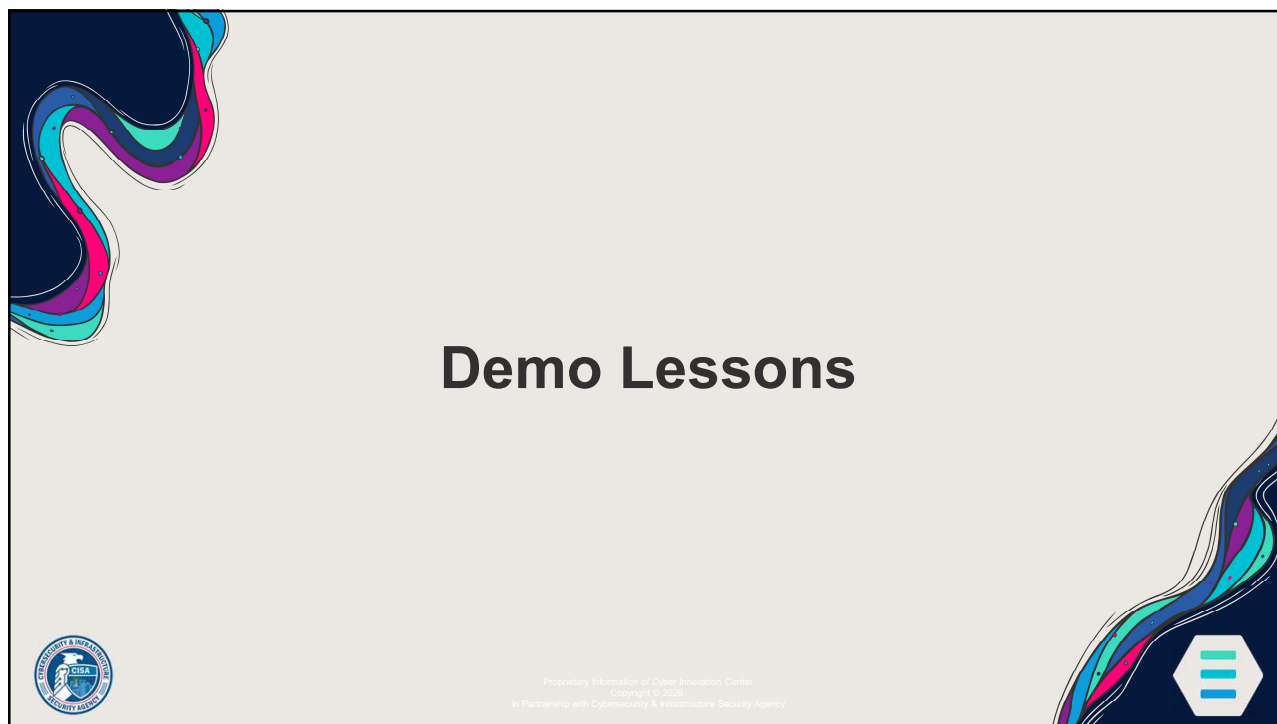
AI Fundamentals Resources

- **Unit Guides:** Includes an overview, student objectives, standards and certificate objectives, unit launch questions, unit terms, outlines the lessons including objectives for all components, and provides a career connection.
- **Lesson Guide:** Provides information commonly required for lesson plans, background information, scripted notes to teach the lesson, tips and strategies, and sample responses for embedded questions and knowledge checks.
- **Slides:** Present the content to students and has embedded knowledge checks to “chunk” content and assess learning.
- **Labs:** Reinforces lesson content using the CYBER.ORG Range in slides and pdf formats.
- **Activities:** Unplugged activities used to expand on topics and concepts.
- **Assessments:** One for each lesson separated into multiple choice, critical thinking, and extended response questions.
- **Unit Case Studies:** These aim to provide a multi-day collaborative assignment that encompasses topics from the entire unit, expanding critical thinking on debated topics and/or issues arising with AI usage in society.

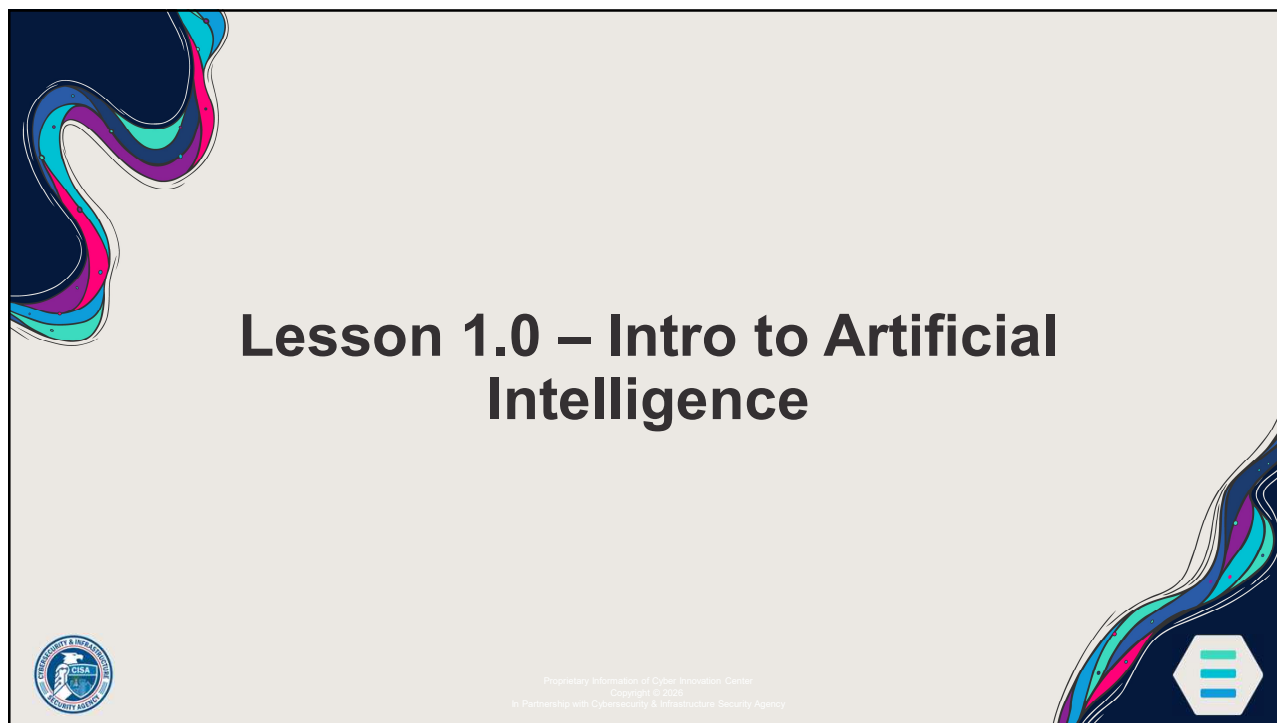



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AI Fundamentals

1.0 – Introduction to Artificial Intelligence



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Introduction to Artificial Intelligence

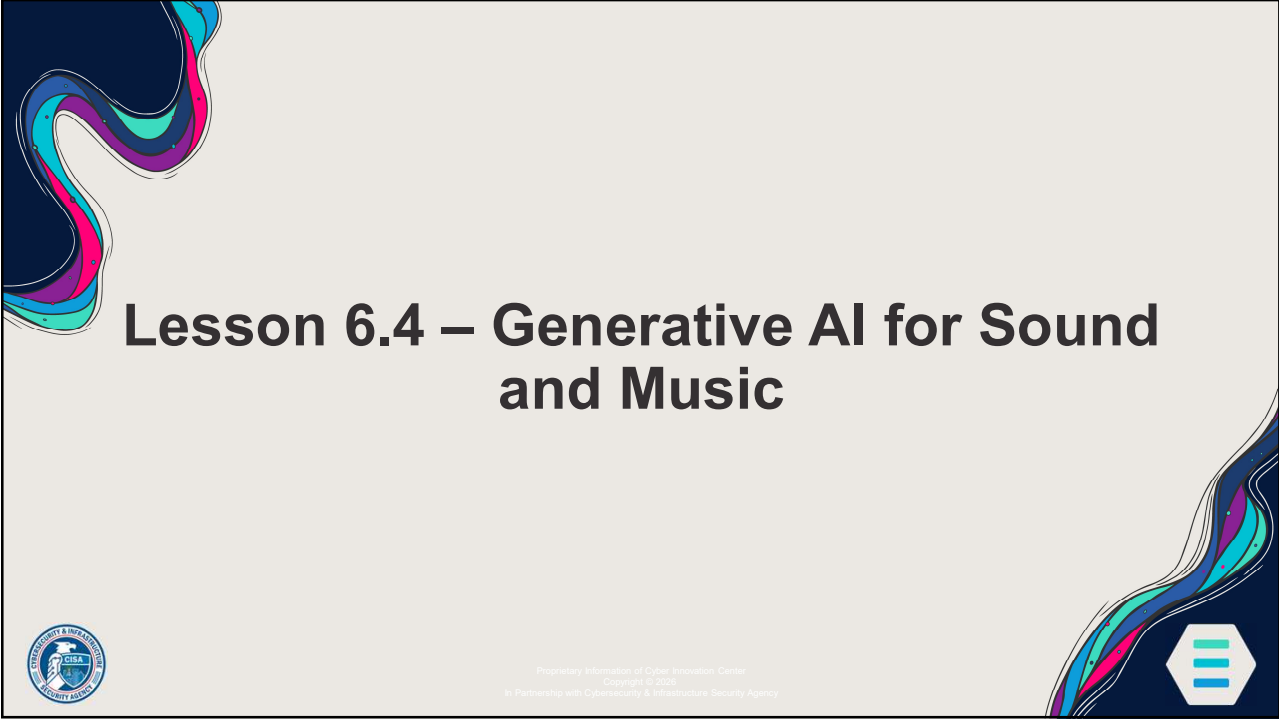
Guiding Question: What is artificial intelligence (AI), and how does it impact the way we live, learn, and interact with technology?

Students will:

- Define AI and identify common examples in everyday life.
- Identify the primary domains of AI that are used to build and train AI models.



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Lesson 6.4 – Generative AI for Sound and Music



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AI Fundamentals

6.4 – Generative AI for Sound and Music



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Generative AI for Sound and Music

Guiding Question: How can generative AI create sound and music, and what responsibilities come with using AI-generated audio?

Students will:

- Explain how generative AI can create music, sound effects, voices, and audio clips from prompts or examples.
- Compare different uses of generative AI for sound, including music composition, sound design, voice generation, remixing, and accessibility.
- Evaluate ethical, copyright, and intellectual property concerns related to AI-generated music.



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Demo Lab 6.4 – Analyzing Audio



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Analyzing Audio

Guiding Question: How can audio features, metadata, and visual waveform analysis help us make an evidence-based judgment about whether a song may have been AI-generated?

Students will:

- Analyze audio files using Python-based feature extraction.
- Inspect waveform, spectrogram, stereo field, and silent sections of the songs of the audio files using Audacity.
- Evaluate the files' metadata to identify possible production clues.



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Unit Case Studies



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Unit Case Studies

- Serve as a summative assignment to reinforce topics covered by the unit and provide a chance for students to collaborate to create a presentation on the scenario given.
- Requires supporting evidence which is provided through the case study documents.



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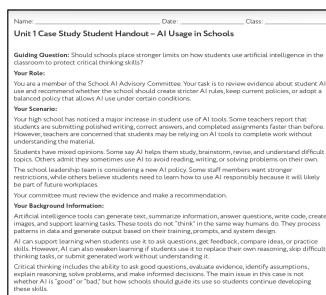
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Unit Case Studies Components

- **Guiding question** – The question should students be answering in the case study
- **Student role** – The job that is being asked of the student, often to make a real-world connection
- **Scenario** – Situation that students must address and present a conclusion on
- **Background information** – Quick review of the topics covered
- **Evidence** – Supporting evidence that students should reference in their decisions and presentation
- **Investigative Questions** – Serve as starting questions to help ensure students cover the goal of the case study



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Unit Case Studies Deliverable

What is your recommendation for a policy addressing the usage of AI in school and its effect on critical thinking?

- **Recommended policy**
 - Choose Option 1, Option 2, Option 3, or propose a revised option.
 - State your group's position clearly.
- **Evidence**
 - Use at least three pieces of evidence from the case packet.
- **Reasoning**
 - Explain how the evidence supports your recommendation.
- **Risks and benefits**
 - Identify at least two benefits and two risks of your recommendation.
- **Safeguards**
 - Recommend at least three rules, support, or classroom practices.
- **Final conclusion**
 - Explain how your policy protects critical thinking while still preparing students to use AI responsibly.

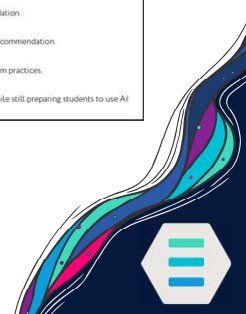
Directions: Provide your recommendation below and then answer the follow-up reflection questions.

1. What is your recommendation for a policy addressing the usage of AI in school and its effect on critical thinking?

- Recommended policy
 - Choose Option 1, Option 2, Option 3, or propose a revised option.
 - State your group's position clearly.
- Evidence
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Unit 1 Case Study Preview

Guiding Question: Should schools place stronger limits on how students use artificial intelligence in the classroom to protect critical thinking skills?

Your Role: You are a member of the School AI Advisory Committee. Your task is to review evidence about student AI use and recommend whether the school should create stricter AI rules, keep current policies, or adopt a balanced policy that allows AI use under certain conditions.

Your Scenario: Your high school has noticed a major increase in student use of AI tools. Some teachers report that students are submitting polished writing, correct answers, and completed assignments faster than before. However, teachers are concerned that students may be relying on AI tools to complete work without understanding the material.

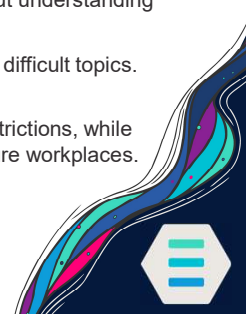
Students have mixed opinions. Some say AI helps them study, brainstorm, revise, and understand difficult topics. Others admit they sometimes use AI to avoid reading, writing, or solving problems on their own.

The school leadership team is considering a new AI policy. Some staff members want stronger restrictions, while others believe students need to learn how to use AI responsibly because it will likely be part of future workplaces.

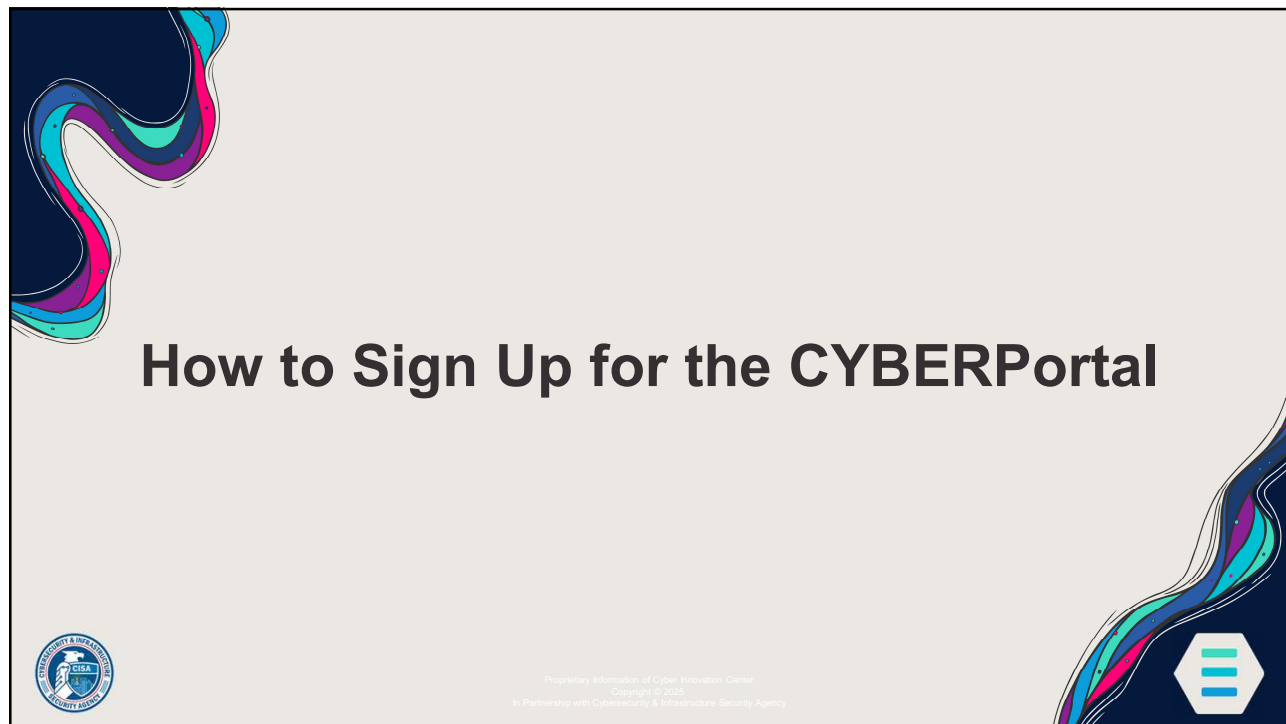
Your committee must review the evidence and make a recommendation.



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Thanks for attending!



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