

CAPSTONE PROJECT

COURSE CONTENT SIMPLIFICATION AGENT

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OUTLINE

- **Problem Statement**
- **Technology used**
- **Wow factor**
- **End users**
- **Result**
- **Conclusion**
- **Git-hub Link**
- **Future scope**
- **IBM Certifications**

PROBLEM STATEMENT

Many students struggle to understand academic content due to complex language or advanced terminology. Traditional teaching materials aren't tailored to each learner's knowledge level. The goal was to build an AI agent that simplifies academic content based on the user's proficiency (Beginner, Intermediate, Expert).

Proposed Solution:

We built this agent on IBM Cloud using Watsonx tools and Granite foundation models to make learning easier for everyone.

TECHNOLOGY USED

- ☐ IBM Cloud Lite account
- ☐ Watsonx.ai Studio
- ☐ IBM Granite foundation model
- ☐ Granite-3-3-8b-instruct model (used for content simplification)
- ☐ IBM Cloud Object Storage
- ☐ Vector Index for document-based Q&A
- ☐ Built-in agent tools (retrieval, summarization, Q&A)

IBM CLOUD SERVICES USED

- ❑ **Watsonx.ai Studio** – to build and manage the AI agent
- ❑ **Watsonx.ai Runtime** – for executing tasks using granite-3-3-8b-instruct
- ❑ **Cloud Object Storage** – for uploading study materials and documents
- ❑ **Agent Lab** – to configure, preview, and deploy the agent
- ❑ **Vector Indexing** – for enabling document-aware question answering

WOW FACTORS

- ❑ Automatically rewrites complex academic content into simpler language based on the learner's level.
- ❑ Built using IBM's powerful granite-3-3-8b-instruct foundation model for high-quality natural language understanding.
- ❑ No coding required — fully built and deployed using Watsonx.ai's visual tools.
- ❑ Supports document upload and vector-based retrieval for personalized Q&A.
- ❑ Dynamic explanation switching (Beginner ↔ Expert) in real time.
- ❑ Simplifies textbook paragraphs, class notes, or user prompts instantly.
- ❑ Can be deployed and previewed as a usable agent with one click.
- ❑ Provides a practical AI education use case for improving accessibility in classrooms.

END USERS

- ❑ **Students:** To better understand difficult academic content in simpler terms.
- ❑ **Teachers:** To create adaptive, easy-to-understand learning materials.
- ❑ **Tutors and Mentors:** For providing individualized learning support.
- ❑ **Curriculum Designers:** To assess and redesign content for inclusivity.
- ❑ **E-learning Platforms:** To offer level-based content delivery.
- ❑ **Academic Support Teams:** To assist students with different learning needs.
- ❑ **Special Education Programs:** For tailoring explanations to students with learning challenges.

RESULTS

- ❑ ***Created the AI agent which responds based on user proficiency.***

The screenshot displays the IBM watsonx chat interface. At the top, a dark navigation bar contains the 'IBM watsonx' logo, an 'Upgrade' button, and several utility icons (help, notifications, share, globe, and a user profile icon labeled 'CS'). Below the navigation bar, a sidebar on the left shows a clock icon and a document icon. The main chat area features a 'New chat +' button in the top right. The conversation history includes a user message from 'You' at 04:13 PM asking for a beginner-friendly explanation of machine learning, followed by a response from the 'Course Content Simplification Agent' at the same time. The agent's response defines machine learning as a type of artificial intelligence that learns from data, using the example of teaching a child to recognize cats. It also offers a simpler version and a link to 'How did I get this answer?'. At the bottom, there is a text input field with the placeholder 'Type something...' and a send button.

IBM watsonx Upgrade ? [notification] [share] [globe] CS

New chat +

You 04:13 PM
What is machine learning? Explain like I'm a beginner.

Course Content Simplification Agent 04:13 PM
Machine learning is a type of artificial intelligence (AI) that allows computers to learn and make decisions without being explicitly programmed. Instead, the computer learns patterns from data.


For example, imagine you're teaching a child to recognize cats in pictures. You might show the child many pictures of cats, saying "cat" each time. Over time, the child learns to identify cats on their own. Machine learning works in a similar way. We feed a machine learning algorithm lots of data (like images), and it identifies patterns to make predictions or decisions without being explicitly told what to look for.

Would you like a simpler version?


► How did I get this answer?


Type something...

RESULTS

 IBM watsonx

Upgrade ? 🔔 C Suravi's Account ▾ Dallas ▾ CS

 New chat +




saying "cat" each time. Over time, the child learns to identify cats on their own. Machine learning works in a similar way. We feed a machine learning algorithm lots of data (like images), and it identifies patterns to make predictions or decisions without being explicitly told what to look for.

Would you like a simpler version?

C

You 03:12 PM

Can you rephrase this definition without using technical terms?




Course Content Simplification Agent 03:12 PM

Sure, think of machine learning as a way for computers to learn from examples, much like how we learn from our experiences. Instead of giving the computer specific rules to follow, we show it many examples, and it figures out the patterns on its own. This way, it can make guesses or decisions about new examples it hasn't seen before.

Shall I explain it with a real-world analogy?

▶ How did I get this answer?



❑ **Curates response based on user input.**

RESULTS

❑ ***Provides simplified response.***

The screenshot shows a web browser window with two tabs: 'IBM watsonx' and 'Course Content Simplification Agent'. The address bar shows the URL 'dataplatfom.cloud.ibm.com/chat/wx?app_id=d%3A155e7073-2d04-4f1c-8fba-e99f0f810ac0%3Aa...'. The page header includes the 'IBM watsonx' logo, an 'Upgrade' button, a help icon, a notification bell, and user information for 'C Suravi's Account' in 'Dallas'. A 'New chat +' button is in the top right.

The chat interface shows a conversation:

- You 03:14 PM:** Can you simplify this paragraph from my textbook?

Original Paragraph: "In classical mechanics, Newton's Second Law of Motion quantitatively describes the relationship between the net external force acting upon an object and the resulting acceleration of that object. Mathematically expressed as $F = ma$, this law implies that the acceleration of an object is directly proportional to the net force applied and inversely proportional to its mass. This fundamental principle underpins much of the predictive power of physics, enabling precise calculations of object motion under varying force conditions."
- Course Content Simplification Agent 03:14 PM:**
Sure, here's a simplified version:

Newton's Second Law of Motion explains how an object moves when a force is applied to it. This law is often written as $F = ma$, where F stands for force, m for mass, and a for acceleration. This equation means that the faster an object accelerates (speeds up), the greater the force applied to it. But, the more massive the object (the more it weighs), the less it will accelerate for the same amount of force. This law is very important in physics because it helps us predict how objects will move under different forces.

Would you like a visual example?

Remember, I'm keeping the core idea of the original text intact while making it easier to understand.

At the bottom is a text input field with the placeholder 'Type something...' and a send button (triangle icon).

RESULTS

Deploy... / Course Content ... / Course Content ... /



Course Content Simplification Agent ✓ Deployed Online

API reference

Test

Preview

New chat +



You 05:04 PM

Can you explain quantum computing using analogies?



Course Content Simplification Agent 05:04 PM

Absolutely, let's break down quantum computing using some relatable analogies.

- 1. Classical Bits vs Quantum Bits (Qubits):** In classical computing, information is stored in bits, which can be either 0 or 1. Think of bits like light switches, either off (0) or on (1). Quantum computing uses quantum bits, or qubits. Unlike a light switch, a qubit can be both 0 and 1 at the same time, thanks to a property called superposition. It's like a dimmer switch that can be on, off, or anywhere

Type something...



☐ ***Deployed Agent.***

CONCLUSION

- ❑ The Course Content Simplification Agent successfully simplifies academic material based on the learner's understanding level.
- ❑ Built using IBM Watsonx.ai Studio and the granite-3-3-8b-instruct model, it provides real-time content adaptation without requiring any code.
- ❑ The agent enhances personalized learning by responding dynamically to user input.
- ❑ It improves comprehension, engagement, and accessibility in education.
- ❑ The solution demonstrates how AI can support inclusive, student-centered content delivery.

GITHUB LINK

<https://github.com/Suravi9740/Course-Simplification-Agent>

FUTURE SCOPE

- ☐ Add support for more subjects and topics
- ☐ Provide answers in multiple languages
- ☐ Allow saving simplified answers as text
- ☐ Improve the accuracy of simplification
- ☐ Make the chatbot available on websites or apps
- ☐ Add memory to follow up on previous questions

IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence



C Suravi

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



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IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

C Suravi

for the completion of

**Lab: Retrieval Augmented Generation with
LangChain**

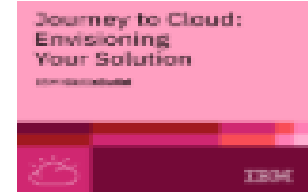
(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 18 Jul 2025 (GMT)

Learning hours: 20 mins

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THANK YOU