CAPSTONE PROJECT

AGENTIC CAREER COUNSELING COMPANION

Presented By:
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OUTLINE

- **Problem Statement** (Should not include solution)
- **Proposed System/Solution**
- **System Development Approach** (Technology Used)
- **Algorithm & Deployment**
- **Result (Output Image)**
- **Conclusion**
- **Future Scope**
- **References**

PROBLEM STATEMENT

Example: Students often struggle to make informed career decisions due to fragmented access to guidance, limited self-awareness of academic strengths, and rapidly evolving industry landscapes. Traditional counseling methods lack personalization and scalability, leading to missed opportunities and career mismatches. The challenge is to develop an intelligent, autonomous agent that continuously monitors student performance, evolving interests, and real-time labor market trends to deliver tailored career pathway suggestions. This would empower students to make confident, future-ready decisions with minimal dependency on manual intervention.

PROPOSED SOLUTION

- The proposed system aims to address the challenge of personalized career guidance by providing tailored suggestions using IBM Cloud and LLM technology. This solution leverages IBM Granite to process student inputs and recommend career paths and learning resources without any external data integration. The solution consists of the following components:
- Data Collection:
  - Collect student input through chatbot or form:,
  - Subjects of interest
  - Hobbies and extracurricular interests
  - Career goals or dream roles
  - Current academic level
- Data Preprocessing:
  - Organize and format user inputs into structured prompt format.
  - Apply basic validation (e.g., ensuring required fields are filled).
  - Convert inputs into a consistent text prompt for the LLM.

- **Deployment:**
  - **Deploy the solution entirely on IBM Cloud Lite.**
  - **Use IBM Granite for LLM processing via instruction prompts.**
  - **No external API integrations; system functions independently.**

- **Evaluation**
  - **Assess output quality based on relevance and clarity of career recommendations.**
  - **Validate suggestions manually against common student profiles.**
  - **Use informal feedback from students to improve prompt instructions.**

SYSTEM APPROACH

Technologies Used:

- IBM Cloud Lite
- IBM Watson Assistant (for chatbot)
- IBM Granite (for LLM-based reasoning)
- IBM Cloud Functions (backend logic)
- IBM Cloudant / DB2 Lite (data storage)

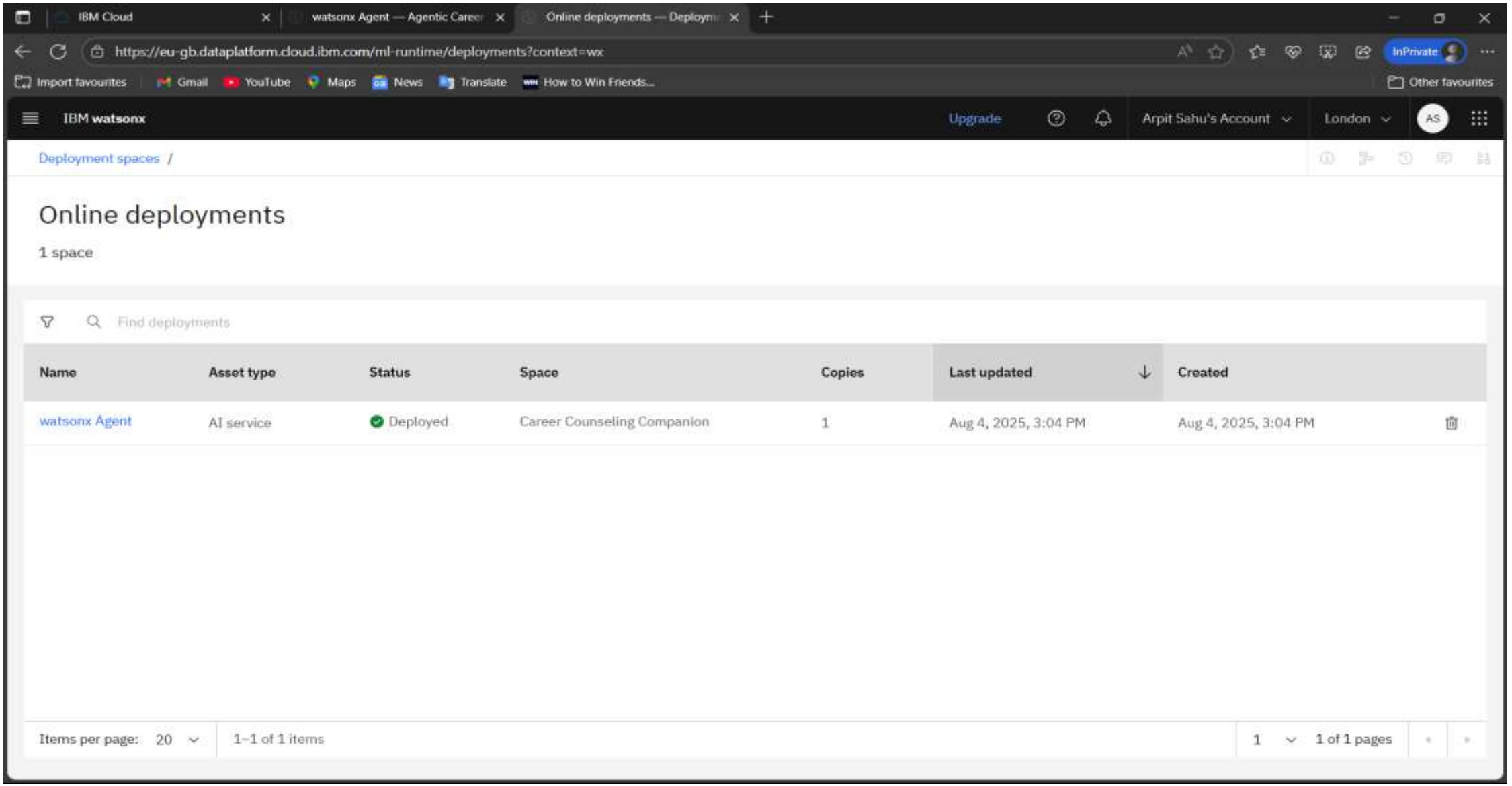
ALGORITHM & DEPLOYMENT

- **Algorithm Selection:**
  - The project uses IBM Granite, a large language model (LLM), to generate career guidance based on user inputs. LLMs are ideal for this problem because they can understand natural language inputs, infer user intent, and generate structured suggestions without needing training on specific datasets.
- **Data Input:**
  - Top 3 subjects they like
  - Top 3 hobbies/interests
  - Career goals or dream jobs
  - Current grade/class level
  - These inputs are formatted into a prompt that guides the LLM in generating relevant responses.
- **Training Process:**
  - No custom training is performed. The model used (IBM Granite) is pre-trained and instruction-tuned. Instead of training, the system relies on prompt engineering to guide the model's responses. Prompts are designed to ask clear questions and receive actionable outputs.
- **Prediction Process:**

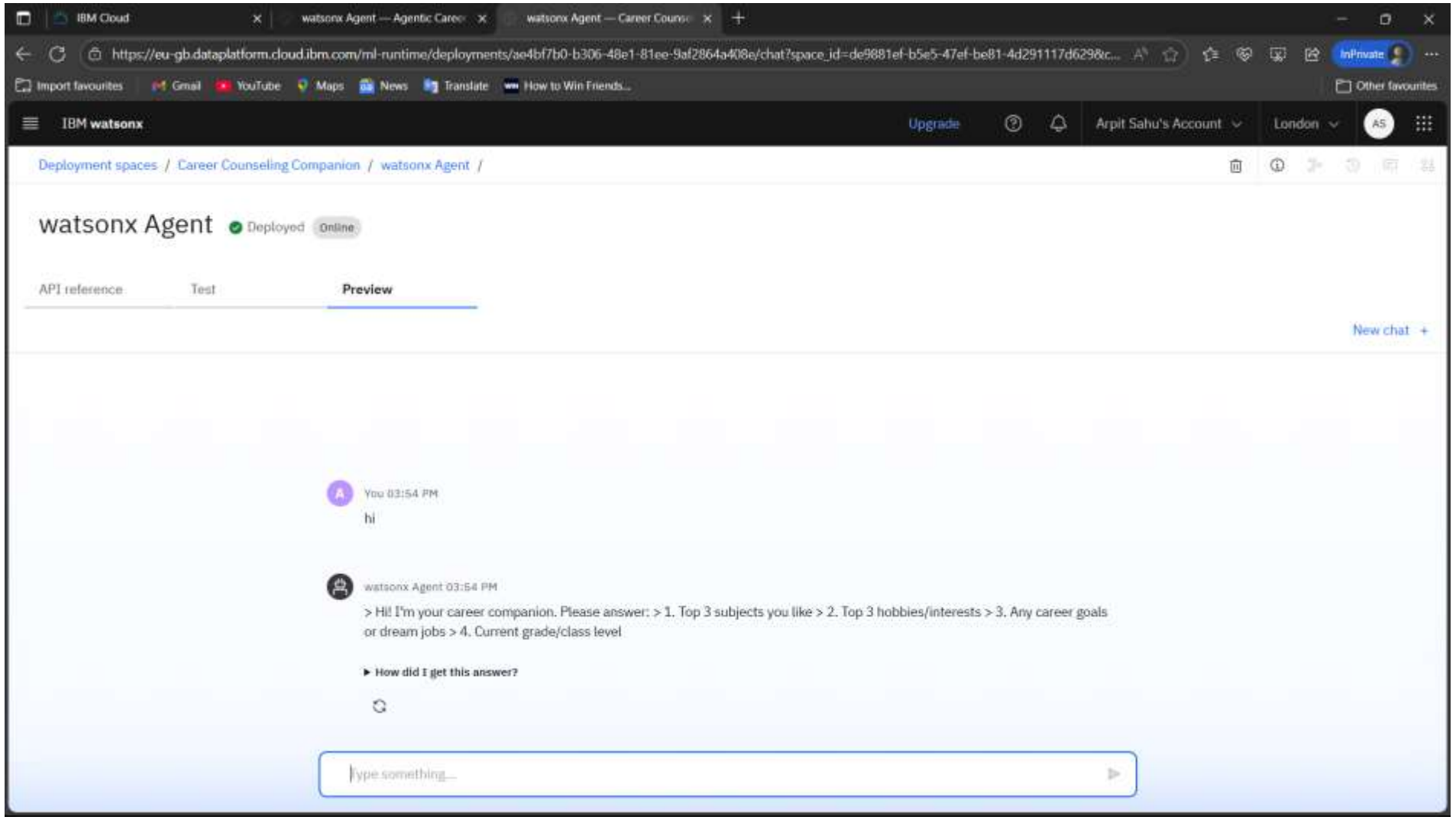
  Once the user provides input, the LLM processes the prompt and outputs:

  2–3 career suggestions , Justification for each career , Recommended skills and courses to pursue

  All outputs are generated in real time based on static instructions — without requiring real-time data or external APIs.



DEPLOYMENT



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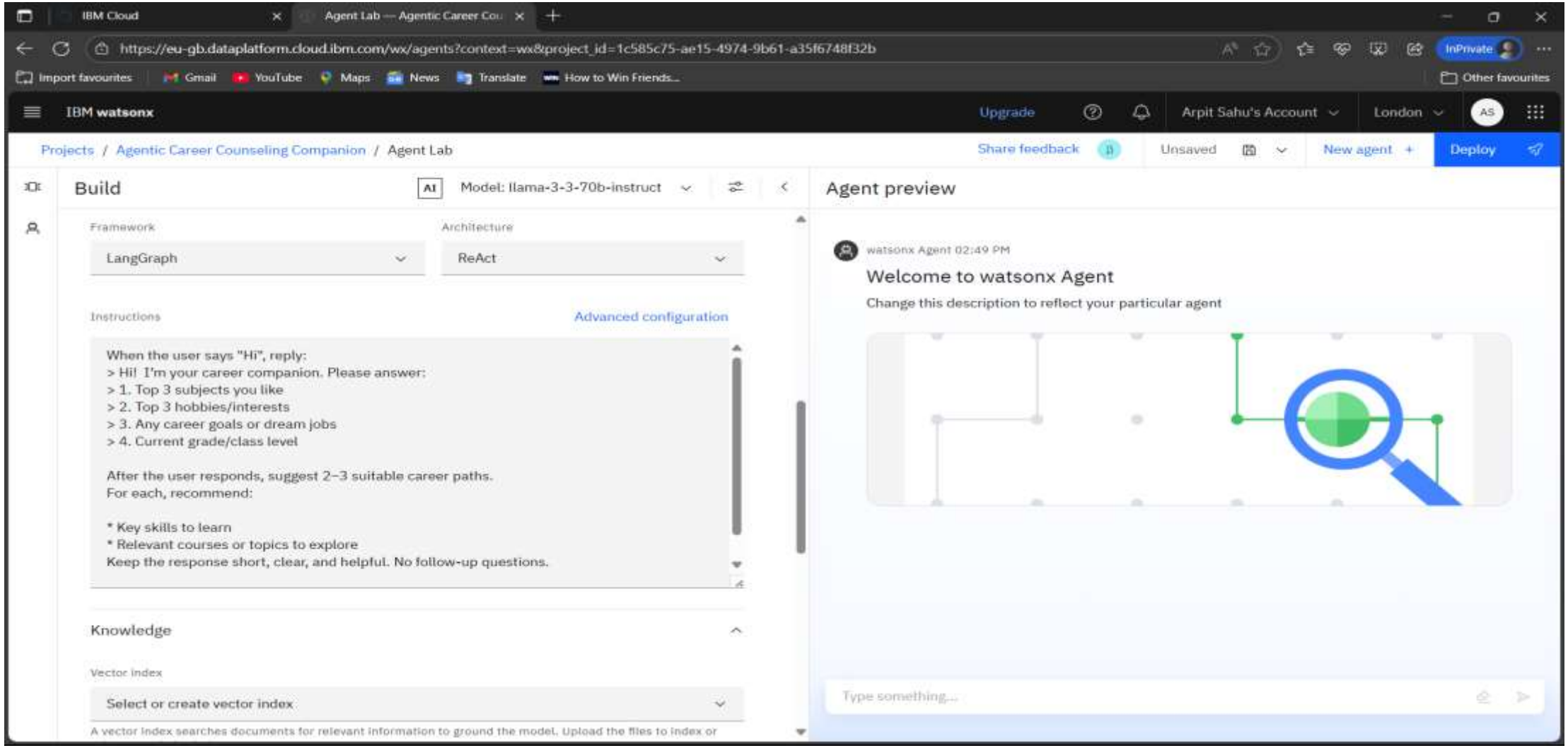
RESULT



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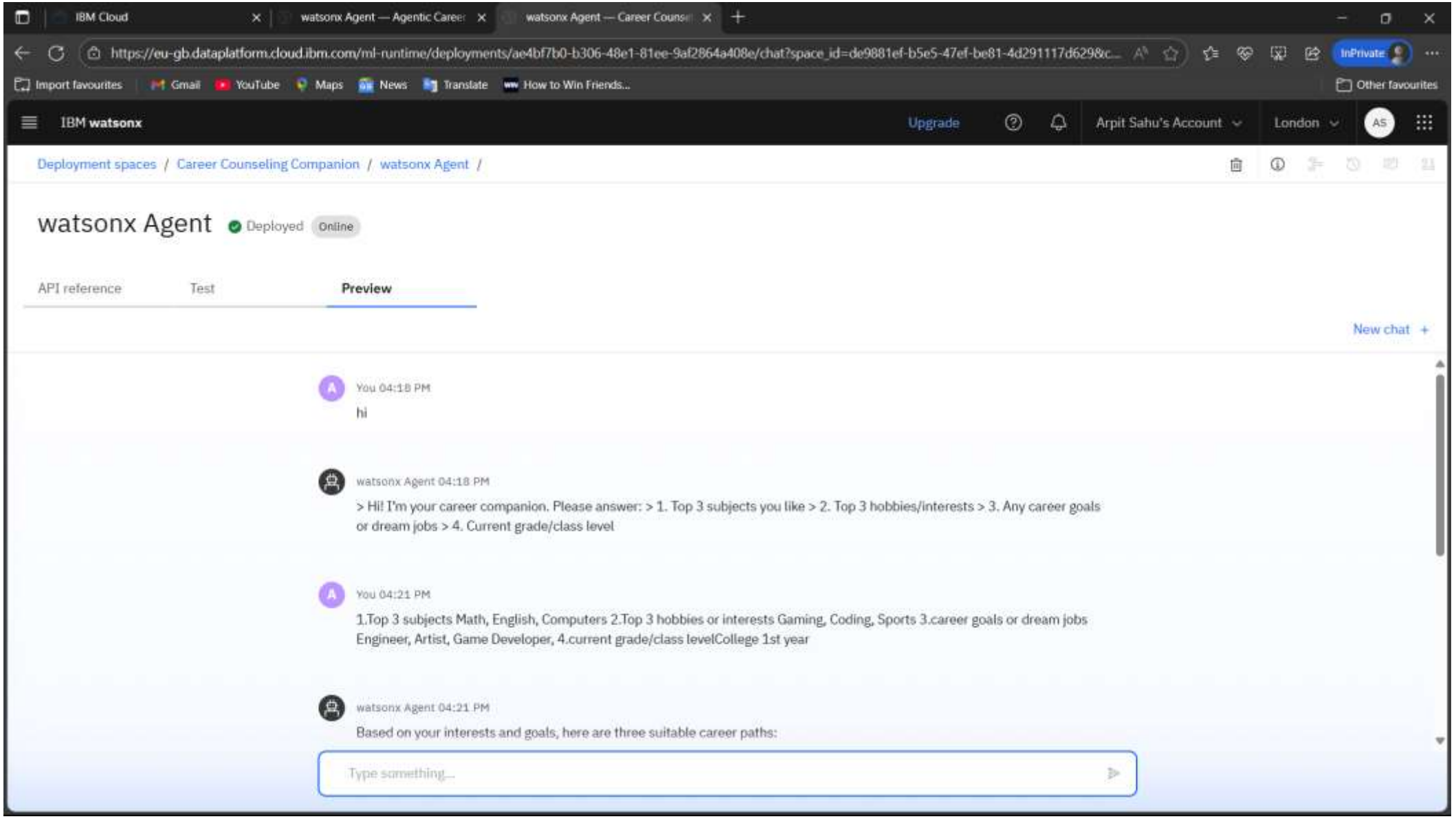
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> Hi! I'm your career companion. Please answer: > 1. Top 3 subjects you like > 2. Top 3 hobbies/interests > 3. Any career goals or dream jobs > 4. Current grade/class level
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1.Top 3 subjects Math, English, Computers 2.Top 3 hobbies or interests Gaming, Coding, Sports 3.career goals or dream jobs Engineer, Artist, Game Developer, 4.current grade/class levelCollege 1st year
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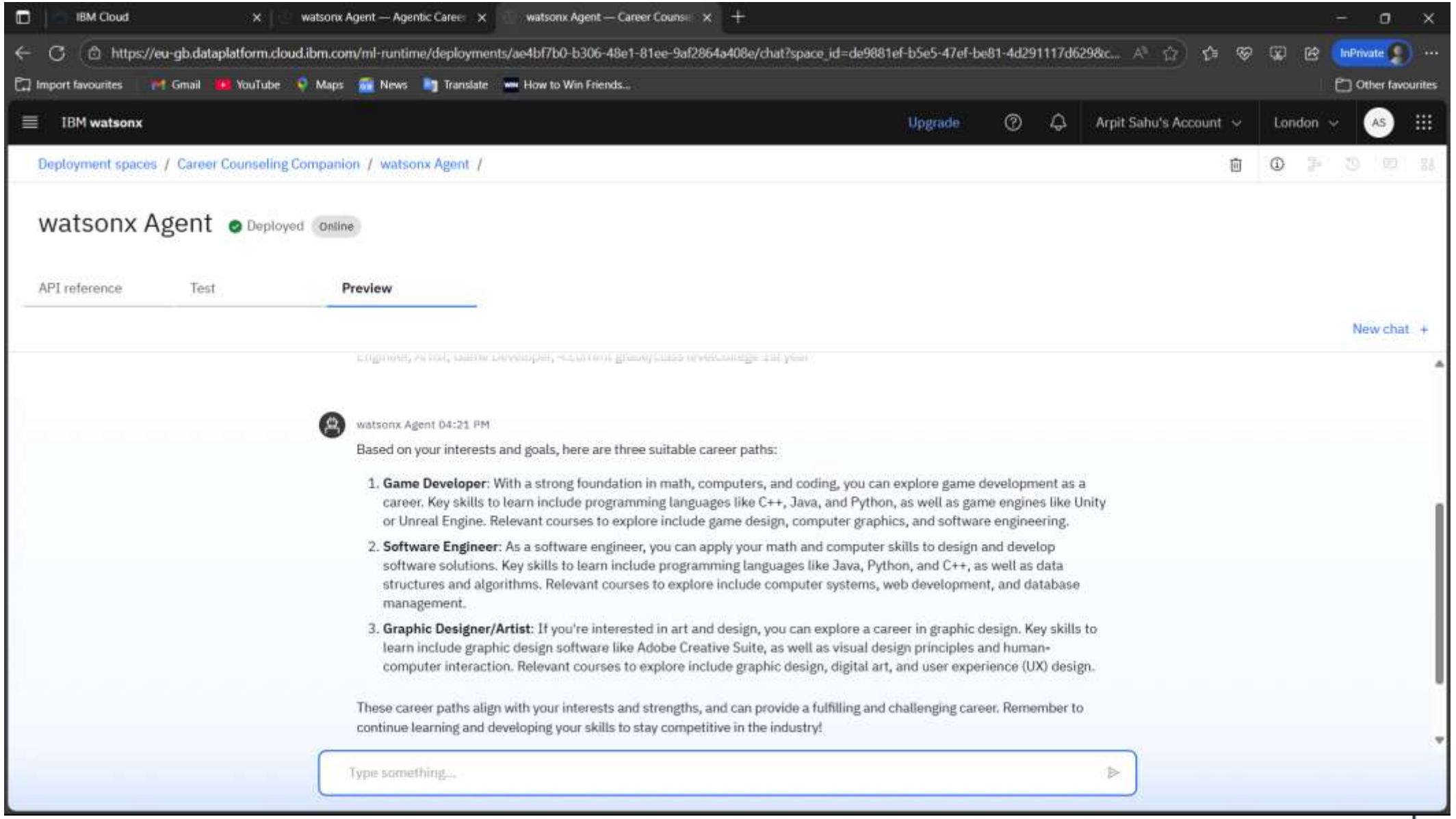
Based on your interests and goals, here are three suitable career paths:
Type something...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Based on your interests and goals, here are three suitable career paths:
1. Game Developer: With a strong foundation in math, computers, and coding, you can explore game development as a career. Key skills to learn include programming languages like C++, Java, and Python, as well as game engines like Unity or Unreal Engine. Relevant courses to explore include game design, computer graphics, and software engineering.
2. Software Engineer: As a software engineer, you can apply your math and computer skills to design and develop software solutions. Key skills to learn include programming languages like Java, Python, and C++, as well as data structures and algorithms. Relevant courses to explore include computer systems, web development, and database management.
3. Graphic Designer/Artist: If you're interested in art and design, you can explore a career in graphic design. Key skills to learn include graphic design software like Adobe Creative Suite, as well as visual design principles and human-computer interaction. Relevant courses to explore include graphic design, digital art, and user experience (UX) design.
These career paths align with your interests and strengths, and can provide a fulfilling and challenging career. Remember to continue learning and developing your skills to stay competitive in the industry!
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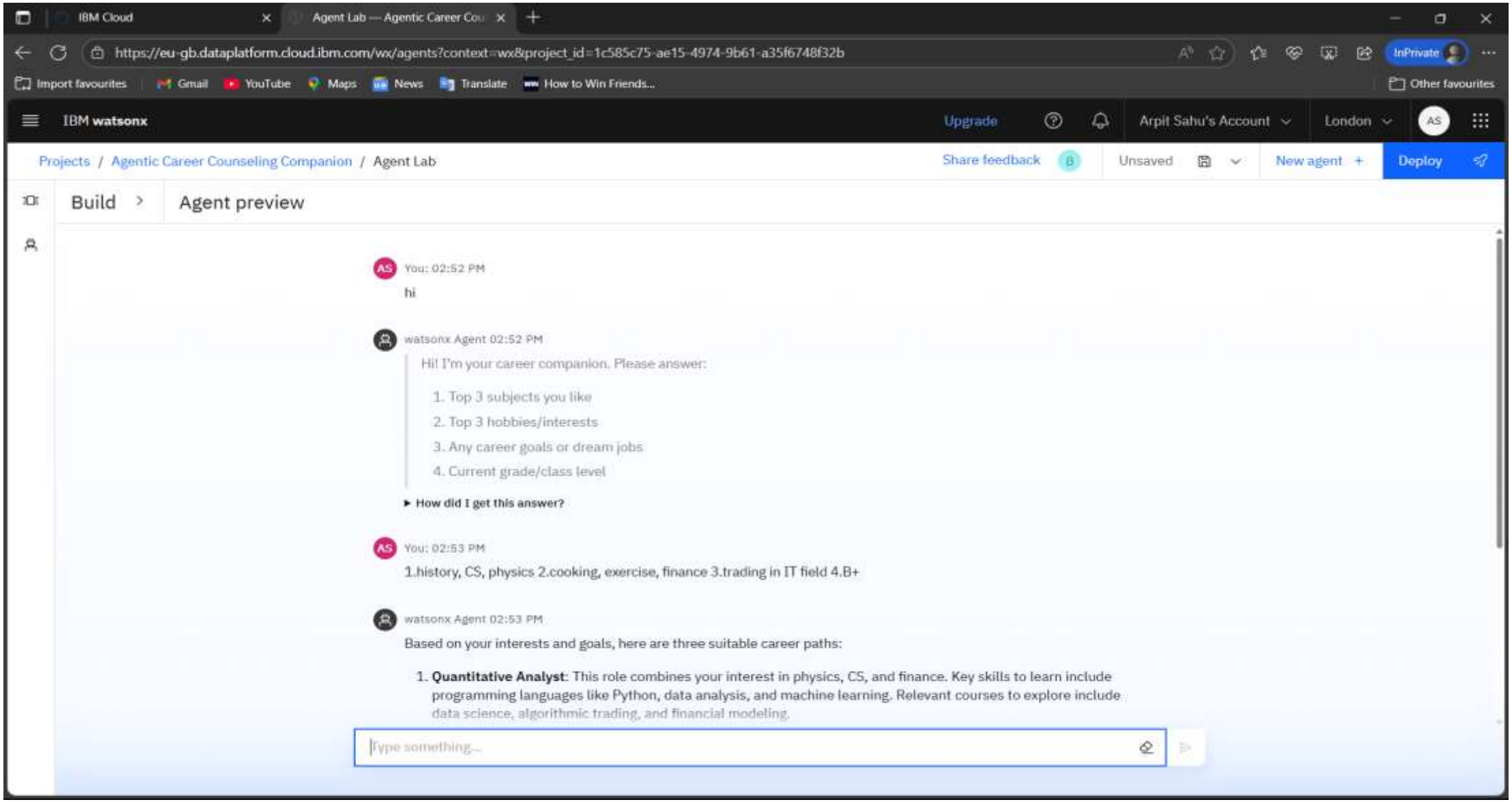

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CONCLUSION

- Key Findings:
  - The system effectively guides students with personalized career suggestions using LLM-based reasoning, without needing large datasets or manual career counseling.
  - The use of IBM Granite enables natural understanding of user input and intelligent mapping to relevant job roles and skills.
  - The project was successfully built and deployed using only IBM Cloud Lite services with no external data/API dependencies.

FUTURE SCOPE

- Real-Time Job Market Integration using APIs for dynamic career suggestion
- Feedback Loop to improve recommendations based on user input
- Voice Assistant Support for hands-free interaction
- Multi-language Support using IBM Watson Translator
- Mobile App Version for broader accessibility
- Counselor Dashboard to track student progress

REFERENCES

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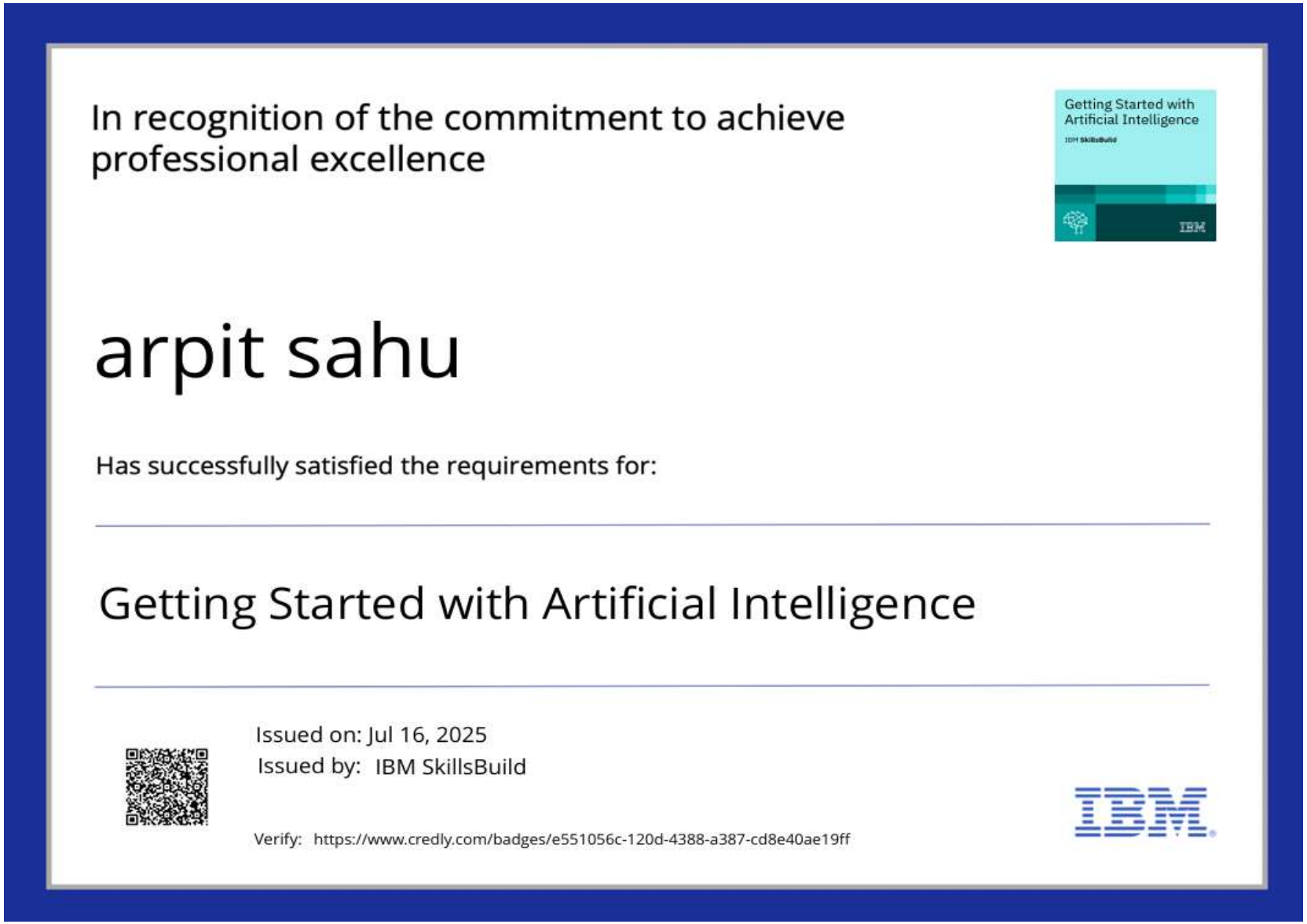
IBM CERTIFICATIONS



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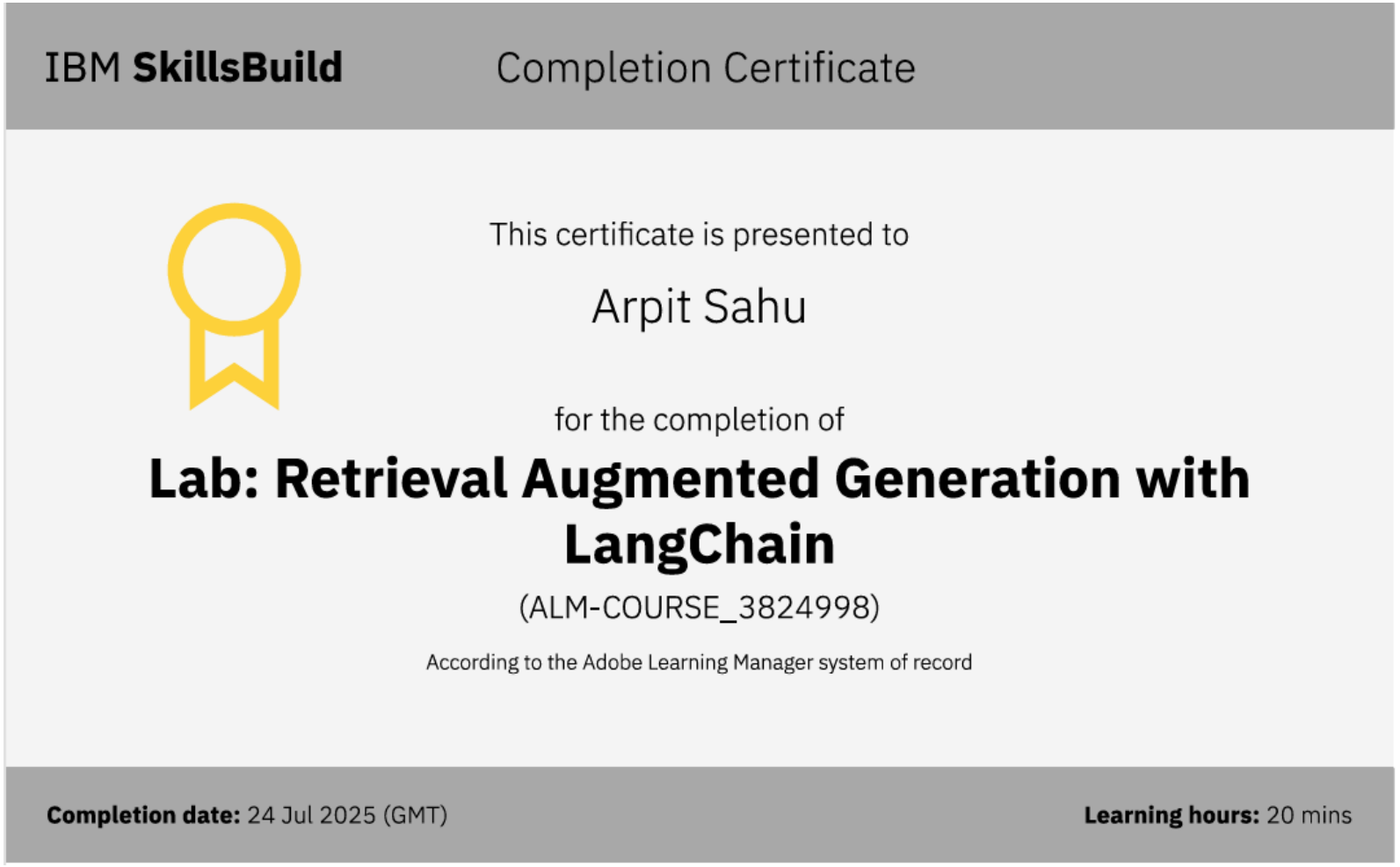

IBM **SkillsBuild** Completion Certificate

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