IBM AICTE PROJECT

AGENTIC CAREER COUNSELLOR

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PROBLEM STATEMENT

Many students struggle with choosing the right career path due to fragmented guidance, lack of awareness about their strengths, and ever-changing job markets. Traditional counseling is manual, limited in reach, and lacks personalization.

Proposed Solution:

An AI-powered career counseling agent that leverages IBM Granite Foundation Models and RAG to provide personalized career guidance based on academic interests, strengths, and labor market trends.

TECHNOLOGY USED

IBM Cloud Lite services

IBM Watsonx Prompt Lab

Retrieval Augmented Generation (RAG)

IBM Granite model

LLM inferencing SDK (watsonx.ai)

IBM CLOUD SERVICES USED

- IBM Watsonx AI Prompt Lab
- IBM Watsonx AI Runtime
- IBM Cloud Object Storage
- IBM Agent

WOW FACTORS

- Semantic Career Matching:

Maps student interests and strengths to career roles using intelligent prompt-based reasoning.

- Auto-Summarized Role Insights:

Provides concise overviews of recommended careers, including skill requirements, future trends, and next steps.

- Real-Time Trend Awareness:

Integrates labor market trends to guide students toward in-demand and future-proof roles.

- Dynamic Q&A Support:

Interacts conversationally to resolve personalized career queries, replicating the role of a live counsellor.

- Pathway Alignment:

Suggests relevant courses, internships, and certifications tailored to the student's chosen path.

- Built with IBM watsonx.ai and Granite Foundation Models

Utilizes Prompt Lab and vector-grounded knowledge to deliver contextual, high-quality responses.

END USERS

- High School & College Students
- Educational Institutions
- Career Counsellors & Coaches
- Parents & Guardians
- Policy Makers & Education Boards

RESULTS

Setup

watsonx API connection

This cell defines the credentials required to work with watsonx API for Foundation Model inferencing.

Action: Provide the IBM Cloud personal API key. For details, see documentation.

[24]:
```
import os
from ibm_watsonx_ai import APIClient, Credentials
import getpass

credentials = Credentials(
    url="https://eu-gb.ml.cloud.ibm.com",
    api_key=getpass.getpass("Please enter your api key (hit enter): ")
)
```

```
Please enter your api key (hit enter):  ········
```

RESULTS

Inferencing

This cell demonstrated how we can use the model object as well as the created access token to pair it with parameters and input string to obtain the response from the the selected foundatic

Defining the model id

We need to specify model id that will be used for inferencing:

[25]
```
model_id = "ibm/granite-3-8b-instruct"
```

Defining the model parameters

We need to provide a set of model parameters that will influence the result:

[26]:
```
parameters = {
    "decoding_method": "greedy",
    "max_new_tokens": 200,
    "min_new_tokens": 0,
    "repetition_penalty": 1
}
```

RESULTS

Defining the project id or space id

The API requires project id or space id that provides the context for the call. We will obtain the id from the project or space in which t

7]:
```
project_id = os.getenv("PROJECT_ID")
space_id = os.getenv("SPACE_ID")
```

Defining the Model object

We need to define the Model object using the properties we defined so far:

3]:
```
from ibm_watsonx_ai.foundation_models import ModelInference

model = ModelInference(
    model_id = model_id,
    params = parameters,
    credentials = credentials,
    project_id = project_id,
    space_id = space_id
    )
```

RESULTS

Defining the inferencing input

Foundation model inferencing API accepts a natural language input that it will use to provide the natural language response. The API is sensitive to formatting. Input structure, presence of training steps (one-shot, two-shot learning etc.), response and belongs to the emerging discipline of Prompt Engineering.

Let us provide the input we got from the Prompt Lab:

```
prompt_input = """What are suitable careers for someone interested in tech and psychology?"""
```

Execution ¶

Let us now use the defined Model object and pair it with input and generate the response:

```
print("Submitting generation request...")
generated_response = model.generate_text(prompt=prompt_input, guardrails=True)
print(generated_response)
```

```
Submitting generation request...


1. Human-Computer Interaction (HCI) Specialist: This role involves designing and evaluating the interaction between humans and computers, focusing on usability and user experience.

2. Cognitive Psychologist in Tech: This career combines psychology and technology, focusing on understanding human cognition and applying this knowledge to improve tech products and services.

3. UX Researcher: UX researchers use psychological principles to understand user behavior and preferences, which informs the design of user-friendly interfaces and experiences.

4. Tech Therapist or Counselor: This role involves using technology to deliver mental health services, such as online therapy platforms or mental health apps.

5. Neurotechnology Specialist: This career involves developing and applying technology to study and enhance brain function, often in fields like neuroscience, neuroengineering, or neuroinformatics.
```

CONCLUSION

- The **Agentic Career Counsellor** harnesses the power of AI and IBM Watsonx to deliver intelligent, personalized, and scalable career guidance.
- By integrating real-time labor market trends, academic insights, and individual student preferences, this solution transforms traditional counselling into a proactive, data-driven experience.
- It empowers students to make confident, future-ready decisions while reducing dependency on manual intervention and fragmented information sources.
- **Outcome:** A reliable, always-available digital advisor that bridges the gap between education and industry through actionable career pathways.

GITHUB LINK

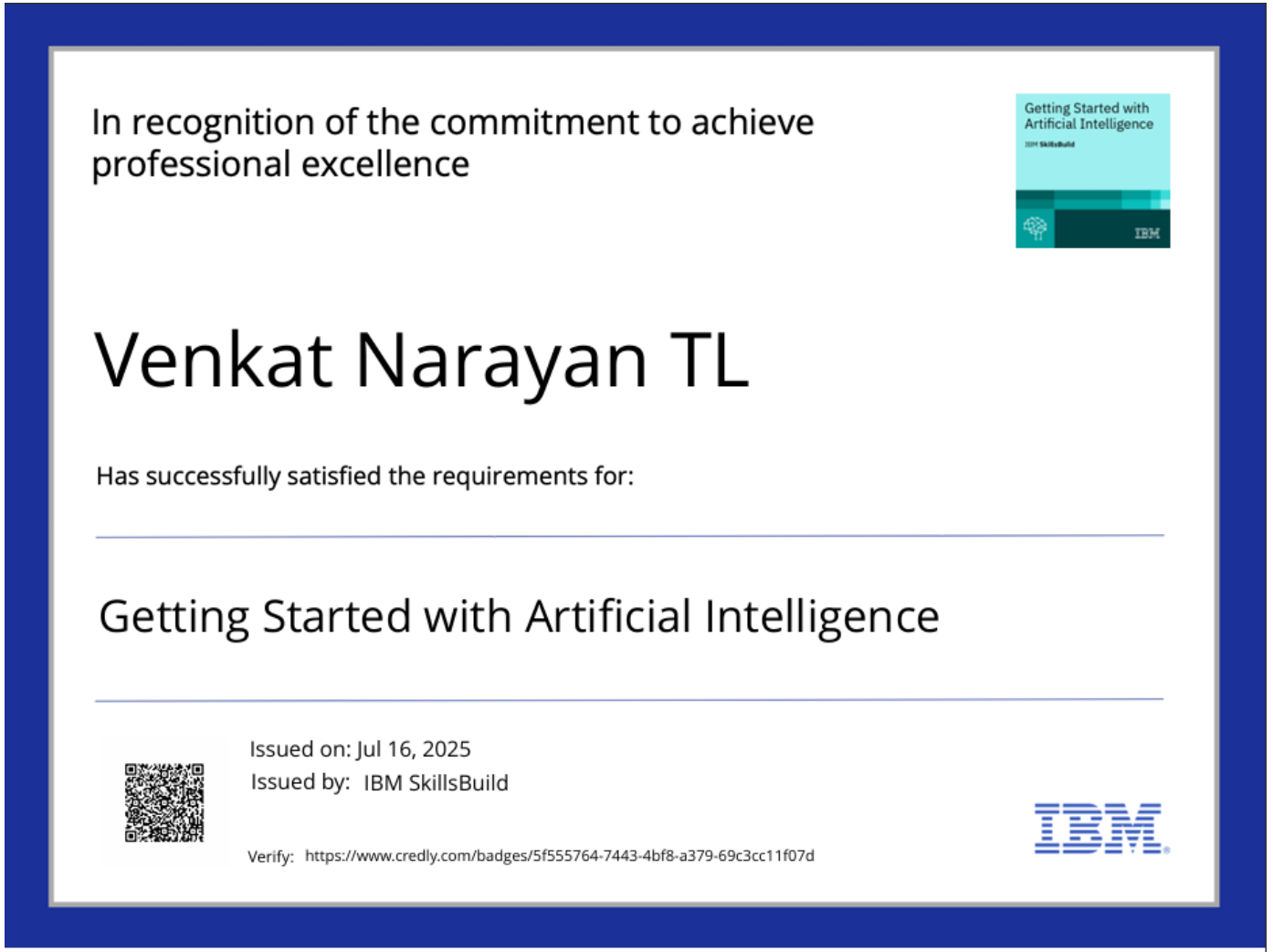
- https://github.com/venkatnarayantl/AgenticCareerCounsellor

FUTURE SCOPE

- Integration with Student Portals and LMS Platforms
- Multi-language Support
- Real-time Labor Market Insights
- Voice-based Interaction
- AI-Driven Career Simulations
- Parental and Teacher Dashboards
- Ethical and Bias Auditing

IBM CERTIFICATIONS

- Screenshot/
- credly certificate(getting started with AI)



Attach your RAG LAB certificate here

IBM **SkillsBuild** Completion Certificate

This certificate is presented to

Venkat Narayan TL

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

THANK YOU

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