Prompt Notebook with Chat - Prompt Lab Notebook v1.1.0

This notebook contains steps and code to demonstrate inferencing of prompts generated in Prompt Lab in watsonx.ai with a chat format. It introduces Python API commands for authentication using API key and prompt inferencing using WML API.

Note: Notebook code generated using Prompt Lab will execute successfully. If code is modified or reordered, there is no guarantee it will successfully execute. For details, see: Saving your work in Prompt Lab as a notebook.

Some familiarity with Python is helpful. This notebook uses Python 3.10.

Notebook goals

The learning goals of this notebook are:

- Defining a Python function for obtaining credentials from the IBM Cloud personal API key
- Defining parameters of the Model object
- Using the Model object to generate response using the defined model id, parameters and the prompt input

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.

```
import os
from ibm_watsonx_ai import APIClient, Credentials
from ibm_granite_community.notebook_utils import get_env_var
import getpass
```

```
credentials = Credentials(
    url="https://us-south.ml.cloud.ibm.com",
    api_key=get_env_var("IBM_CLOUD_TOKEN")
)
```

```
IBM_CLOUD_TOKEN loaded from Google Colab secret.
```

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 foundation model.

Defining the model id

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

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

Defining the model parameters

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

```
parameters = {
    "frequency_penalty": 0,
    "max_tokens": 2000,
    "presence_penalty": 0,
    "temperature": 0.7,
    "top_p": 1
}
```

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 this notebook runs:

```
project_id = get_env_var("PROJECT_ID")
space_id = get_env_var("SPACE_ID")
```

```
PROJECT_ID loaded from Google Colab secret.
SPACE_ID loaded from Google Colab secret.
```

Defining the Model object

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

```
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
    )
```

Defining the vector index

Initialize the vector index (not applicable here) to query when chatting with the model.

```
from ibm_watsonx_ai.foundation_models.utils import Toolkit

def proximity_search( query ):

    api_client = APIClient(
        project_id=project_id,
        credentials=credentials,
    )

    document_search_tool = Toolkit(
        api_client=api_client
    ).get_tool("RAGQuery")

    config = {
    "projectId": project_id
    }

    results = document_search_tool.run(
        input=query,
        config=config
    )
```

```
        return results.get("output")
```

Defining the inferencing input for chat

Foundation models supporting chat accept a system prompt that instructs the model on how to conduct the dialog. They also accept previous questions and answers to give additional context when inferencing. Each model has it's own string format for constructing the input.

Let us provide the input we got from the Prompt Lab and format it for the selected model:

```
    tone =  """informative"""

    prompt_input = f"""Answer the provided question in a short, concise manner and

    chat_messages = [
        {
            "role": "user",
            "content": [
                {"type": "text", "text": "Q: How do I make a budget?\nA:"}
            ]
        },
        {
            "role": "assistant",
            "content": [
                {"type": "text", "text": "First, sit down and track all of your inc
            ]
        },
        {
            "role": "user",
            "content": [
                {"type": "text", "text": "Q: Should I have an emergency fund?\nA:"}
            ]
        },
        {
            "role": "assistant",
            "content": [
                {"type": "text", "text": "An emergency fund is there to help you ir
            ]
        },{
            "role": "user",
            "content": [
                {"type": "text", "text": "Q: Should I pay down my debts or save for
            ]
        },
```

```
        {
            "role": "assistant",
            "content": [
                {"type": "text", "text": "The answer to this question really depenc
            ]
        },{
            "role": "user",
            "content": [
                {"type": "text", "text": "Q: Does my credit score matter?\nA:"}
            ]
        },
        {
            "role": "assistant",
            "content": [
                {"type": "text", "text": """Your credit score can have a big impact

    Maintaining a good credit score is something you should start working on as soc
            ]
        },{
            "role": "user",
            "content": [
                {"type": "text", "text": "Q: How much money should you save each mc
            ]
        },
        {
            "role": "assistant",
            "content": [
                {"type": "text", "text": """The amount you should save each month c

    If you have specific saving goals, such as a down payment on a home or an early
            ]
        },{
            "role": "user",
            "content": [
                {"type": "text", "text": "Q: How do I set achievable targets for gr
            ]
        },
        {
            "role": "assistant",
            "content": [
                {"type": "text", "text": "Begin by analyzing your current cash flow
            ]
        },{
            "role": "user",
            "content": [
                {"type": "text", "text": "Q: What’s a reliable framework for transl
            ]
        },
        {
            "role": "assistant",
            "content": [
```

```
                {"type": "text", "text": "Try the “50/30/20” split: half your take-
            ]
        }
    ]
```

Execution

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

```
question = input("Question: ")
# grounding = proximity_search(question) # Removed the call to proximity_search
chat_messages.append({"role": "user", "content": question}) # Directly use the
generated_response = model.chat(messages=chat_messages)
print(generated_response)
```

```
Question: How can I better budget my personal finances as a college student? How
{'id': 'chatcmpl-05af33b8571e8813427a3a88faeb4faa---6f2bc041-3406-4d17-93a2-ded1
```

```
output = generated_response['choices'][0]['message']['content']
```

```
from IPython.display import Markdown, display

def print_markdown(string):
  display(Markdown(string))

print_markdown(output)
```

Budgeting as a college student can be challenging, but with some planning and discipline, it's achievable. Here are some steps to help you budget effectively while managing student debt and saving:

1. **Track your income and expenses**: Start by listing all your sources of income, including any part-time jobs, financial aid, or support from family. Then, identify and categorize your expenses into needs (rent, food, transportation, tuition) and wants (entertainment, non-essential shopping).
2. **Create a budget plan**: Based on your income and expenses, allocate funds to each category. A modified version of the 50/30/20 rule (50% on needs, 30% on wants, 20% on savings and debt repayment) can be practical, though you might need to adjust percentages depending on your situation.
3. **Minimize unnecessary expenses**: Look for ways to cut down on non-essential costs. This could include eating out less, opting for more affordable entertainment options, using public transportation, or shopping around for the best deals on textbooks and other school supplies.
4. **Prioritize student loan repayment**: Make sure to include regular payments toward your student loans in your budget plan. Even small, consistent payments can help reduce your overall debt burden over time. Consider exploring options like income-driven repayment plans or refinancing if you qualify.
5. **Set up a small emergency fund**: Life can be unpredictable, and having a small financial cushion can help you manage unexpected expenses. Aim to save even a small amount each month.
6. **Explore additional income sources**: Look for ways to earn extra money to accelerate your

Next steps

You successfully completed this notebook! You learned how to use watsonx.ai inferencing SDK to generate response from the foundation model based on the provided input, model id and model parameters. Check out the official watsonx.ai site for more samples, tutorials, documentation, how-tos, and blog posts.

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