Llama 3.2 Multimodal Prompting

> ⌛ **Note** `(Kernel Starting)` **:** This notebook takes about 30 seconds to be ready to use. You may start and watch the video while you wait.

```
In [1]:  import warnings
         warnings.filterwarnings('ignore')
```

```
In [2]:  from utils import load_env
         load_env()
```

Text input only question

```
In [3]:  from utils import llama32
         from utils import llama31
```

> 💻 **Access** `requirements.txt` **and** `utils.py` **files:** 1) click on the *"File"* option on the top menu of the notebook and then 2) click on *"Open"*. For more help, please see the *"Appendix - Tips and Help"* Lesson.

```
In [4]:  messages = [
           {"role": "user",
             "content": "Who wrote the book Charlotte's Web?"}
         ]
```

```
In [5]:  response_32 = llama32(messages, 90)
         print(response_32)
```

```
The book "Charlotte's Web" was written by E.B. White.
```

```
In [6]:  response_31 = llama31(messages,70)
         print(response_31)
```

```
The book "Charlotte's Web" was written by E.B. White.
```

Reprompting with new question

```
In [7]:  messages = [
           {"role": "user",
             "content": "Who wrote the book Charlotte's Web?"},
               {"role": "assistant",
             "content": response_32},
               {"role": "user",
             "content": "3 of the best quotes"}
         ]
```

In [8]:
```python
response_32 = llama32(messages,90)
print(response_32)
```

Here are three of the most famous and beloved quotes from "Charlotte's Web":

1. **"You have been my friend," replied Charlotte. "That in itself is a tremendous thing. I wove my webs for you because I liked you. After all, what's a life anyway? We're born, we live a little while, we die. A spider's life can't help being something of a mess, with all this hustling and bustling about, trying to find something to eat and a place to sleep, and then, of course, there's the web. But I wouldn't trade it. It's a pretty good life, if you ask me."**

— Charlotte (Chapter 21)

2. **"It is not often that someone comes along who is a true friend and a good writer. Charlotte was both."**

— Narrator (Chapter 22)

3. **"You've got a friend in me, Wilbur."**

— Charlotte (Chapter 9)

These quotes capture the essence of the story, highlighting the themes of friendship, loyalty, and the fleeting nature of life.

In [9]:
```python
response_31 = llama31(messages,70)
print(response_31)
```

Here are three famous quotes from "Charlotte's Web" by E.B. White:

1. "You have been my friend," replied Charlotte. "That in itself is a tremendous thing. I wove my webs for you because I liked you. After all, what's a life anyway? We're born, we live a little while, we die. A spider's life can't help being something of a mess, with all this hurrying backward and forward, this scurrying around from one place to another, this scrounging for food; but I wouldn't want to live anywhere else."

2. "It is not often that someone comes along who is a true friend and a good writer. Charlotte was both."

3. "You've got a friend in me."

Question about an image

In [10]:
```python
from utils import disp_image
```

In [11]:
```python
disp_image("images/Llama_Repo.jpeg") # Example usage for local image
```

Image from a URL

```
In [12]: image_url = ("https://raw.githubusercontent.com/meta-llama/"
                       "llama-models/refs/heads/main/Llama_Repo.jpeg")
         messages = [
           {"role": "user",
             "content": [
               {"type": "text",
                 "text": "describe the image in one sentence"
               },
               {"type": "image_url",
                 "image_url": {"url": image_url}
               }
             ]
           },
         ]
```

```
In [13]: disp_image(image_url)
         result = llama32(messages,90)
         print(result)
```

The image depicts three llamas, one of which is purple and wearing a party hat, standing behind a table with a glass of beer on it.

Using a local image

In [14]:
```python
import base64

def encode_image(image_path):
  with open(image_path, "rb") as image_file:
    return base64.b64encode(image_file.read()).decode('utf-8')
base64_image = encode_image("images/Llama_Repo.jpeg")
```

In [15]:
```python
messages = [
  {"role": "user",
    "content": [
      {"type": "text",
        "text": "describe the image in one sentence"
      },
      {"type": "image_url",
        "image_url": {"url": f"data:image/jpeg;base64,{base64_image}"}
      }
    ]
  },
]
```

In [16]:
```python
disp_image(image_url)
result = llama32(messages,90)
print(result)
```

The image depicts three llamas, one of which is wearing a party hat, sitting at a table with a glass of orange liquid.

Follow up question about an image

```
In [17]:  messages = [
            {"role": "user",
              "content": [
                {"type": "text",
                  "text": "describe the image in one sentence"
                },
                {"type": "image_url",
                  "image_url": {"url": f"data:image/jpeg;base64,{base64_image}"}
                }
              ]
            },
            {"role": "assistant", "content": result},
            {"role": "user", "content": "how many of them are purple?"}
          ]
```

```
In [18]:  result = llama32(messages)
          print(result)
```

One of the llamas is purple.

Define llama32pi() helper

```
In [19]:  def llama32pi(prompt, image_url, model_size=90):
            messages = [
              {
                "role": "user",
                "content": [
                  {"type": "text",
                    "text": prompt},
                  {"type": "image_url",
```

```
            "image_url": {
              "url": image_url}
          }
        ]
      },
    ]
  result = llama32(messages, model_size)
  return result
```

In [20]:
```
print(llama32pi("describe the image in one sentence",
                "https://raw.githubusercontent.com/meta-llama/"
                "llama-models/refs/heads/main/Llama_Repo.jpeg"))
```

The image depicts three llamas, one of which is purple and wearing a party hat, standing behind a table with a glass of beer on it.

In [21]:
```
print(llama32pi("describe the image in one sentence",
                f"data:image/jpeg;base64,{base64_image}"))
```

The image depicts three llamas, one of which is wearing a party hat, sitting at a table with a glass of orange liquid.

Plant recognition

In [22]:
```
disp_image("images/tree.jpg")
```


In [23]:
```
question = ("What kind of plant is this in my garden?"
            "Describe it in a short paragraph.")
```

In [24]:
```
base64_image = encode_image("images/tree.jpg")
result = llama32pi(question, f"data:image/jpg;base64,{base64_image}")
print(result)
```

The plant in your garden is a pomegranate tree, scientifically known as Pu nica granatum. It is a deciduous shrub or small tree that can grow up to 1 2 feet tall. The leaves are dark green, glossy, and oval-shaped, with a po inted tip. The flowers are red and bell-shaped, and they bloom in the spri ng. The fruit is a large, leathery berry with a hard, woody rind that cont ains hundreds of juicy arils, which are the edible seeds surrounded by a f leshy pulp. Pomegranate trees prefer full sun and well-drained soil, and t hey are relatively low-maintenance. They are also drought-tolerant, but th ey will produce more fruit if they receive regular watering.

Dog breed recognition

In [25]:
```python
disp_image("images/ww1.jpg")
```


In [26]:
```python
question = (("What dog breed is this? Describe in one paragraph,"
            "and 3-5 short bullet points"))
base64_image = encode_image("images/ww1.jpg")
result = llama32pi(question, f"data:image/jpg;base64,{base64_image}")
print(result)
```

The dog breed depicted in the image is a Labrador Retriever, specifically a yellow Labrador puppy. The image showcases the puppy's distinctive featu res, including its short, dense coat and broad head with a well-defined st op (the area where the muzzle meets the forehead). The puppy's ears are ha nging down to the side of its head, and its eyes are dark brown. Its tongu e is pink and slightly protruding from its mouth.

Here are some key characteristics of the Labrador Retriever breed:

* **Coat:** Short, dense, and straight
* **Color:** Yellow, black, or chocolate
* **Size:** Medium to large (55-80 pounds)
* **Temperament:** Friendly, outgoing, and energetic
* **Intelligence:** Highly intelligent and easily trainable

In [27]:
```python
disp_image("images/ww2.png")
```


In [28]:
```python
base64_image = encode_image("images/ww2.png")
result = llama32pi(question, f"data:image/png;base64,{base64_image}")
print(result)
```

The dog breed depicted in the image is a Labrador Retriever. This conclusion can be drawn from several key characteristics:

*   **Physical Appearance:** The dog has a short, dense coat that is yellow in color, which is one of the three main colors for Labradors (the others being black and chocolate). Its ears are floppy, and its tail is long and straight, both typical features of the breed.
*   **Size and Build:** Although the dog appears to be a puppy, its size and build suggest it will grow into a medium to large-sized dog, consistent with the Labrador breed's adult size range.
*   **Facial Features:** The dog's face, with its broad head, friendly eyes, and black nose, aligns with the classic appearance of a Labrador Retriever.

Key Characteristics of Labrador Retrievers:

*   **Coat Color:** Yellow, black, or chocolate.
*   **Size:** Medium to large.
*   **Temperament:** Friendly, outgoing, and highly intelligent.
*   **Purpose:** Originally bred for retrieving game, now often kept as family pets and used in various roles such as guide dogs, search and rescue dogs, and therapy dogs.

Tire pressure warning

In [29]:
```python
disp_image("images/tire_pressure.png")
```

```
In [30]: question = (("What's the problem this is about?"
                      " What should be good numbers?"))
```

```
In [31]: base64_image = encode_image("images/tire_pressure.png")
         result = llama32pi(question, f"data:image/png;base64,{base64_image}")
         print(result)
```

The image shows a dashboard warning light for low tire pressure. The recom
mended tire pressure is 33 psi, but the current pressure is 31 psi. This i
ndicates that the tire pressure is slightly below the recommended level.

To resolve this issue, you should check the tire pressure and inflate it t
o the recommended level of 33 psi. It's important to note that underinflat
ed tires can lead to reduced fuel efficiency, uneven tire wear, and increa
sed risk of a blowout. Therefore, it's essential to address this issue pro
mptly to ensure safe and efficient driving.

```
In [ ]:
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