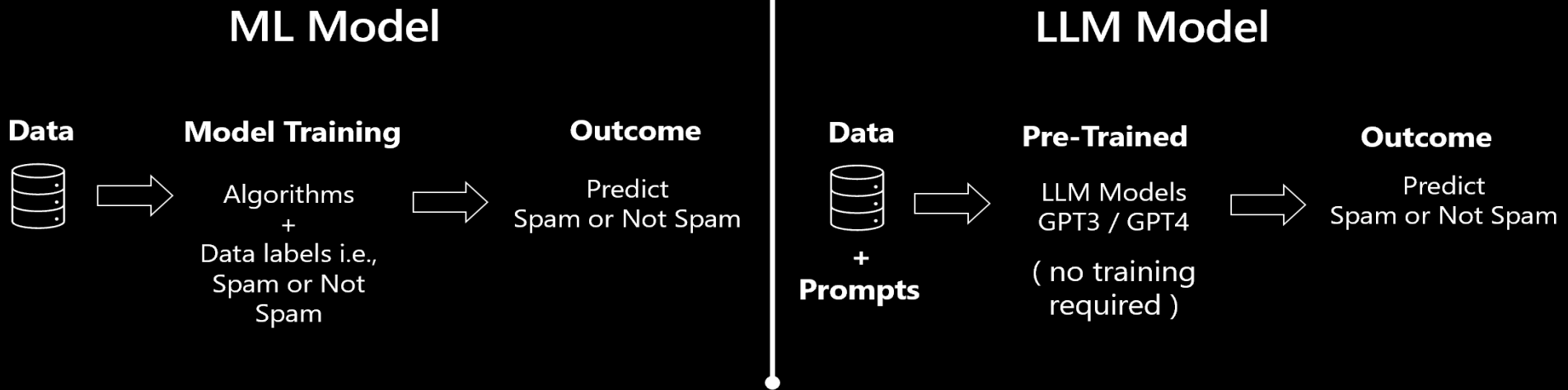LARGE LANGUAGE MODEL

LLM:

- A Large Language Model (LLM) is a type of artificial intelligence model that has been trained on vast amounts of text data to understand and generate human-like language. These models, such as OpenAI's GPT (Generative Pre-trained Transformer) series, are capable of performing a wide range of natural language processing (NLP) tasks, including text generation, translation, summarization, question answering, and more.

How its work

1. **Training Data**: LLMs are trained on large datasets containing text from various sources such as books, articles, websites, and more. The model learns patterns, associations, and semantics from this data.

2. **Transformer Architecture**: Most modern LLMs, including GPT, are based on the Transformer architecture. Transformers excel at capturing long-range dependencies in text, making them well-suited for NLP tasks.

3. **Pre-training and Fine-tuning**: LLMs undergo two stages: pre-training and fine-tuning. During pre-training, the model learns general language representations. In fine-tuning, the model is further trained on specific tasks with labeled data to adapt its knowledge.
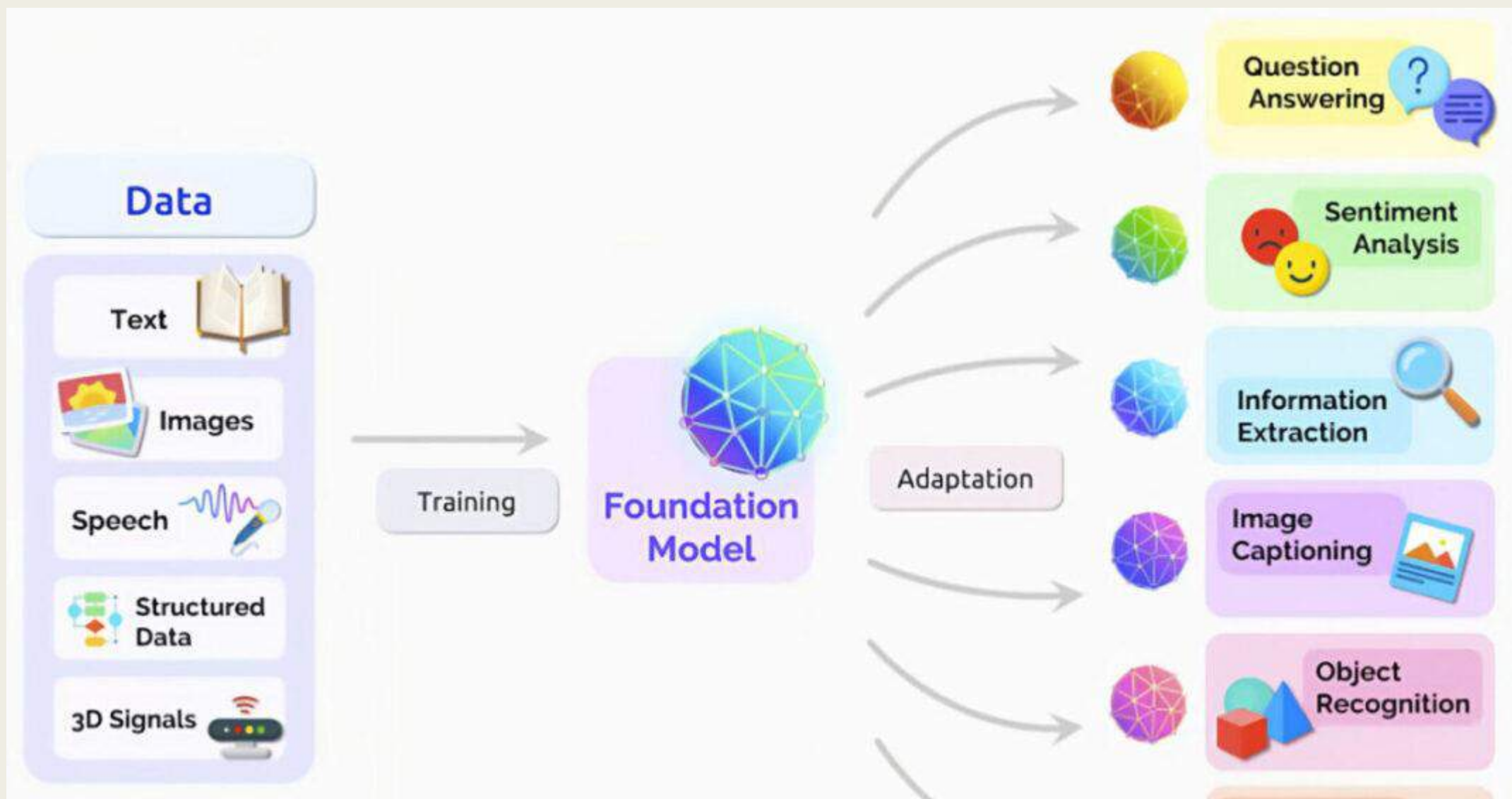
Applications of Large Language Models:

1. **Text Generation**: LLMs can generate human-like text based on a given prompt. This capability has applications in content creation, dialogue generation, storytelling, and more.

2. **Translation**: LLMs can translate text between languages, enabling cross-lingual communication and localization of content.

3. **Summarization**: LLMs can generate summaries of long documents or articles, helping users quickly grasp the main points without reading the entire text.

4. **Question Answering**: LLMs can answer questions based on context, either from a given passage or general knowledge.

5. **Sentiment Analysis**: LLMs can analyze the sentiment of text, determining whether it expresses positive, negative, or neutral emotions. This has applications in social media monitoring, customer feedback analysis, and brand reputation management.

6. **Chatbots and Conversational Agents**: LLMs can power chatbots and conversational agents that engage in natural language conversations with users, providing customer support, information retrieval, or entertainment.

Implementation:

➤ The "GPT" stands for "Generative Pre-trained Transformer," which indicates that its based on the transformer architecture, commonly used for large language models.

➤ Creating the OpenAI API key

➤ Importing the required libraries

➤ Using the models for the required following method

Examples:

1. **Chatbot**

2. **Image Generation**
   1. Text to Image
   2. Image Variation
   3. Edit an image

Chatbot:

model:Gpt-3.5-turbo

```python
import openai

openai.api_key="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"

messages=[{"role":"system","content":"You are a kind of Assistant"}]

while True:
    message = input("User: ")
    if not message:
        break
    messages.append(
            {"role": "user", "content": message},
        )
    chat = openai.ChatCompletion.create(
            model="gpt-3.5-turbo", messages=messages
        )

    reply = chat.choices[0].message.content
    print(f"ChatGPT: {reply}")
    messages.append({"role": "assistant", "content": reply})
```

User: [   ]

■ OUTPUT

```
User: who is the prime minister of india?
ChatGPT: As of September 2021, the Prime Minister of India is Narendra Modi.
User: what is the capital of india?
ChatGPT: The capital of India is New Delhi.
User: how many states are there in india?
ChatGPT: As of 2021, there are 28 states and 8 Union Territories in India.
User: what are the famous places in india?
ChatGPT: India is a country with rich cultural heritage and diverse landscapes, offering a wide range of famous places for tour
ists to visit. Some of the most popular tourist destinations in India include:

1. Taj Mahal in Agra
2. Jaipur - known for its historical forts and palaces
3. Goa - famous for its beaches and vibrant nightlife
4. Kerala - known for its backwaters, lush greenery, and Ayurvedic treatments
5. Varanasi - one of the oldest cities in the world, known for its spiritual significance
6. Mumbai - India's vibrant city with a blend of modernity and tradition
7. Udaipur - known for its lakes and palaces
8. Darjeeling - famous for its tea gardens and stunning views of the Himalayas
9. Hampi - a UNESCO World Heritage Site known for its ancient ruins
10. Rishikesh - a spiritual hub and popular destination for yoga and meditation

These are just a few of the many famous places in India that attract visitors from around the world. India's diverse culture, h
istory, and natural beauty offer a unique travel experience for those looking to explore the country.

User: [                                        ]
```

APPLYING GRADIO INTERFACE

```
Running on local URL:  http://127.0.0.1:7860

To create a public link, set `share=True` in `launch()`.
```

Chat with OpenAI

message	output
machine learning?	

Clear	Flag

Submit

Out[2]:

ChatGPT:Narendra Modi is the current Prime Minister of India.
ChatGPT:Machine learning is a subset of artificial intelligence that focuses on the development of computer programs that can learn and improve from experience without being explicitly programmed. It involves the use of algorithms and statistical models to enable computers to perform specific tasks without being programmed to do so. Machine learning is used in various fields such as image and speech recognition, medical diagnosis, financial forecasting, and many more.
ChatGPT:The top 10 cars in India in terms of popularity and sales may vary over time, but as of now, some of the top-selling car models in India include:

1. Maruti Suzuki Swift
2. Maruti Suzuki Baleno
3. Hyundai Creta
4. Hyundai Venue
5. Kia Seltos
6. Maruti Suzuki Dzire
7. Tata Nexon
8. Hyundai i20
9. Maruti Suzuki Wagon R
10. Mahindra Thar

Please note that the rankings may change based on sales data and consumer preferences.

Image Generation

model:dall-e-2

1.Text to Image generation

```python
[9]: import openai

     openai.api_key ="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"
     response = openai.Image.create(
         model="dall-e-2",
         prompt="Childrens playing with balls",
         quality="standard",
          n=1,
          size="512x512"
     )


     image_url = response["data"][0]["url"]
     print("Generated Image URL:", image_url)

     Generated Image URL: https://oaidalleapiprodscus.blob.core.windows.net/private/org-BJGRzrAimefYB7NEbmZoRuY9/user-y9Se4cbUkgWALA
     EDM5ZHBmMY/img-9wbRUA0g0gusx4uatoPYlgkz.png?st=2024-03-28T05%3A47%3A41Z&se=2024-03-28T07%3A47%3A41Z&sp=r&sv=2021-08-06&sr=b&rsc
     d=inline&rsct=image/png&skoid=6aaadede-4fb3-4698-a8f6-684d7786b067&sktid=a48cca56-e6da-484e-a814-9c849652bcb3&skt=2024-03-27T1
     7%3A44%3A27Z&ske=2024-03-28T17%3A44%3A27Z&sks=b&skv=2021-08-06&sig=Mr44KQVaTRTGt0KgvPqpsqj0gpYW3CN90IRvLjUwQds%3D
```

- OUTPUT:

2.Image variation

```
|: import openai
   openai.api_key = "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"

   response = openai.Image.create_variation(
       model="dall-e-2",
       image=open(r"C:\Users\RAHUL\Downloads\flower (1).png", "rb"),
       n=1,
       size="512x512"
   )

   image_url = response.data[0].url
   print("Generated Image URL:", image_url)
```

Generated Image URL: https://oaidalleapiprodscus.blob.core.windows.net/private/org-BJGRzrAimefYB7NEbmZoRuY9/user-y9Se4cbUkgWALA
EDM5ZHBmMY/img-QrAa3iEq7GGvlOj0UcwBgA25.png?st=2024-03-28T06%3A00%3A40Z&se=2024-03-28T08%3A00%3A40Z&sp=r&sv=2021-08-06&sr=b&rsc
d=inline&rsct=image/png&skoid=6aaadede-4fb3-4698-a8f6-684d7786b067&sktid=a48cca56-e6da-484e-a814-9c849652bcb3&skt=2024-03-27T1
7%3A45%3A29Z&ske=2024-03-28T17%3A45%3A29Z&sks=b&skv=2021-08-06&sig=I18XNzDiizs4fsl4teE/16vPdgXCZ2BmQb01uXVVEYM%3D

Input

Output

3.Edit an Image

```python
In [26]: import openai
openai.api_key="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"
from PIL import Image

# Open the mask image
mask_image = Image.open(r"C:\Users\RAHUL\Downloads\bird.png")

# Resize the mask image to match the size of the original image (1920x1200 in this case)
mask_image_resized = mask_image.resize((1920,1200))

# Save the resized mask image
mask_image_resized.save("resized_mask.png")


response = openai.Image.create_edit(
    model="dall-e-2",
            image=open(r"C:\Users\RAHUL\Downloads\nature-grass-14.png","rb"),
             mask=open("resized_mask.png","rb"),
             prompt="A birds flying in the sky",
             n=1,
             size="512x512",
                )
image_url=response.data[0].url
print("Generated Image URL:", image_url)
```

Generated Image URL: https://oaidalleapiprodscus.blob.core.windows.net/private/org-JoxSwXIUeLJzpJLDDazDrZWn/user-eIuFL4TK4ANzW6FQqjenNpXB/img-4WFHdrbXeOsr1MGI9ZdaFhaV.png?st=2024-03-28T06%3A33%3A36Z&se=2024-03-28T08%3A33%3A36Z&sp=r&sv=2021-08-06&sr=b&rscd=inline&rsct=image/png&skoid=6aaadede-4fb3-4698-a8f6-684d7786b067&sktid=a48cca56-e6da-484e-a814-9c849652bcb3&skt=2024-03-27T17%3A41%3A06Z&ske=2024-03-28T17%3A41%3A06Z&sks=b&skv=2021-08-06&sig=GoyR/XdnUaVu4ndPHrpCJE//SLeodEYhGA5cWoVQwmk%3D

Thank you....