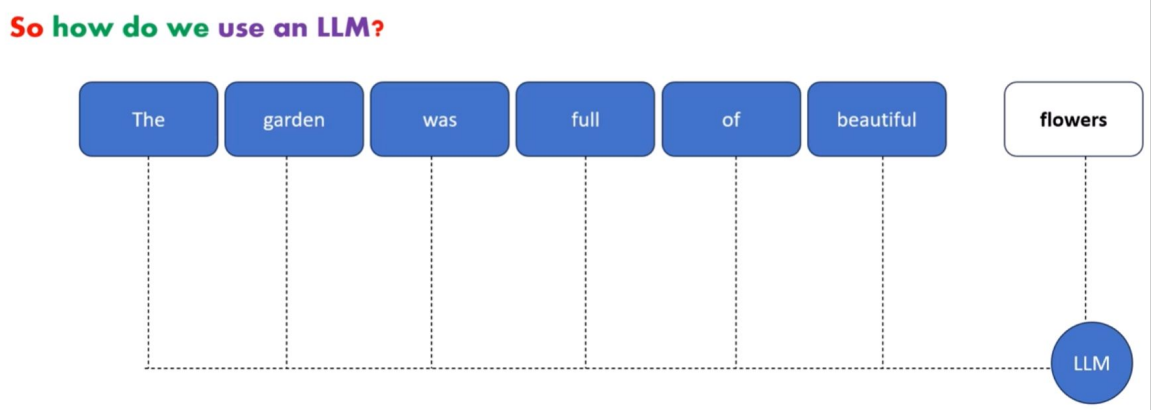
LLMs

What is LLMs?

A large Language model is a trained deep learning model that understands and generate text in a human like fashion.

LLMs are good at Understanding and generating human language



Why we call it Large Language Model?

Because of the size and complexity of the Neural Network as well as the size of the dataset that it was trained on.

Researchers started to make these models large and trained on huge datasets

That they started showing impressive results like understanding complex Natural Language and generating language more eloquently than ever.

What makes LLM so Powerful?

- In case of LLM, one model can be used for a whole variety of tasks like:-

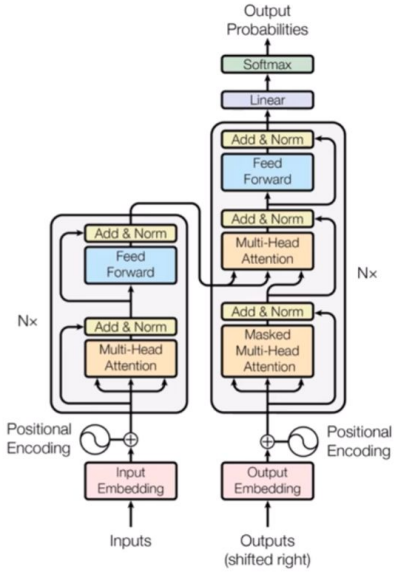
Text generation, Chatbot, summarizer, translation, code generation

& so on ...

So, LLM is subset of Deep Learning & it has some properties merge with Generative AI

LLMs Model Architecture

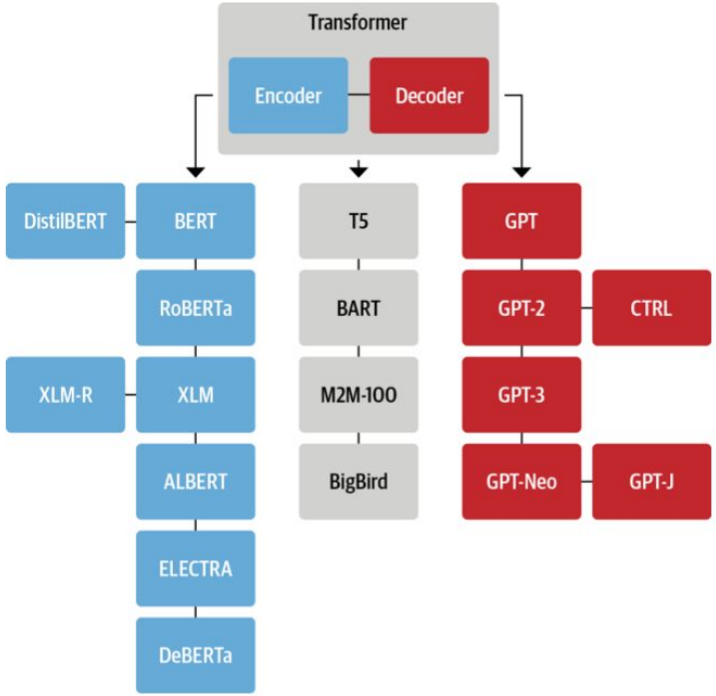
Large Language models are based on transformer a type of Neural Network Architecture invented by Google.



Few milestone in large language model

- **BERT:** Bidirectional Encoder Representations from Transformers (BERT) was developed by Google
- **GPT:** GPT stands for "Generative Pre-trained Transformer".The model was developed by OpenAI
- **XLM:** Cross-lingual Language Model Pretraining by Guillaume Lample, Alexis Conneau.
- **T5:** The Text-to-Text Transfer Transformer It was created by Google AI
- **Megatron:** Megatron is a large, powerful transformer developed by the Applied Deep Learning Research team at NVIDIA
- **M2M-**100: multilingual encoder-decoder (seq-to-seq) model researchers at Facebook

Transformer Tree



OpenAI Based LLM models

MODELS	DESCRIPTION
GPT-4	A set of models that improve on GPT-3.5 and can understand as well as generate natural language or code
GPT-3.5	A set of models that improve on GPT-3 and can understand as well as generate natural language or code
GPT base	A set of models without instruction following that can understand as well as generate natural language or code
DALL·E	A model that can generate and edit images given a natural language prompt
Whisper	A model that can convert audio into text
Embeddings	A set of models that can convert text into a numerical form
Moderation	A fine-tuned model that can detect whether text may be sensitive or unsafe
GPT-3 Legacy	A set of models that can understand and generate natural language

Other Open Source Models

- BLOOM
- Llama 2
- PaLM
- Falcon
- Claude
- MPT-30B
- Stablelm

So on ....

What can LLMs be used for?

- Text Classification
- Text Generation
- Text Summarization
- Conversation AI like chatbot, Question Answering
- Speech recognition and Speech identification
- Spelling Corrector

So on……

Prompt Designing

All the text that we feed into an LLM as input is called a prompt and this whole art is known as prompt design, which is about figuring out how to write and format prompt text to get LLMs to do what you want

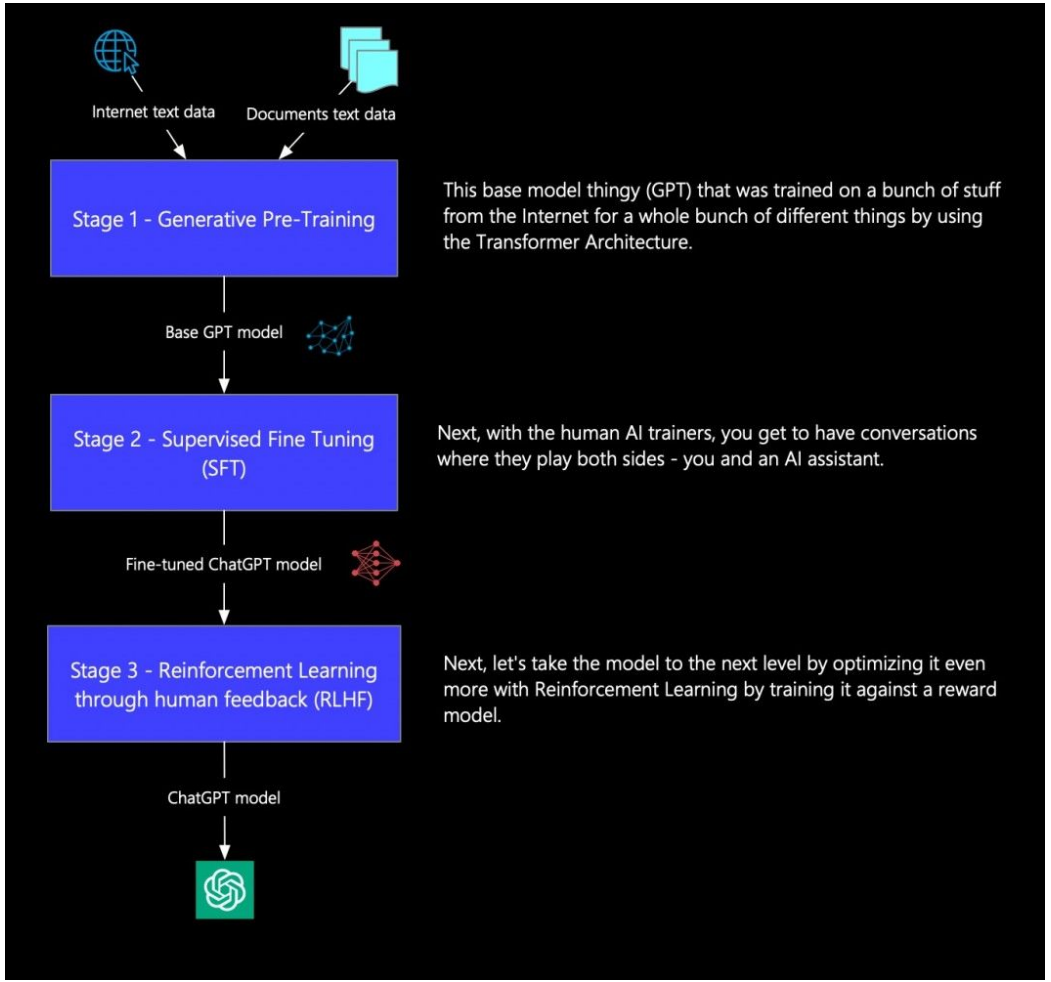
It’s raining cats and

I have two apples and I eat one, I’, left with

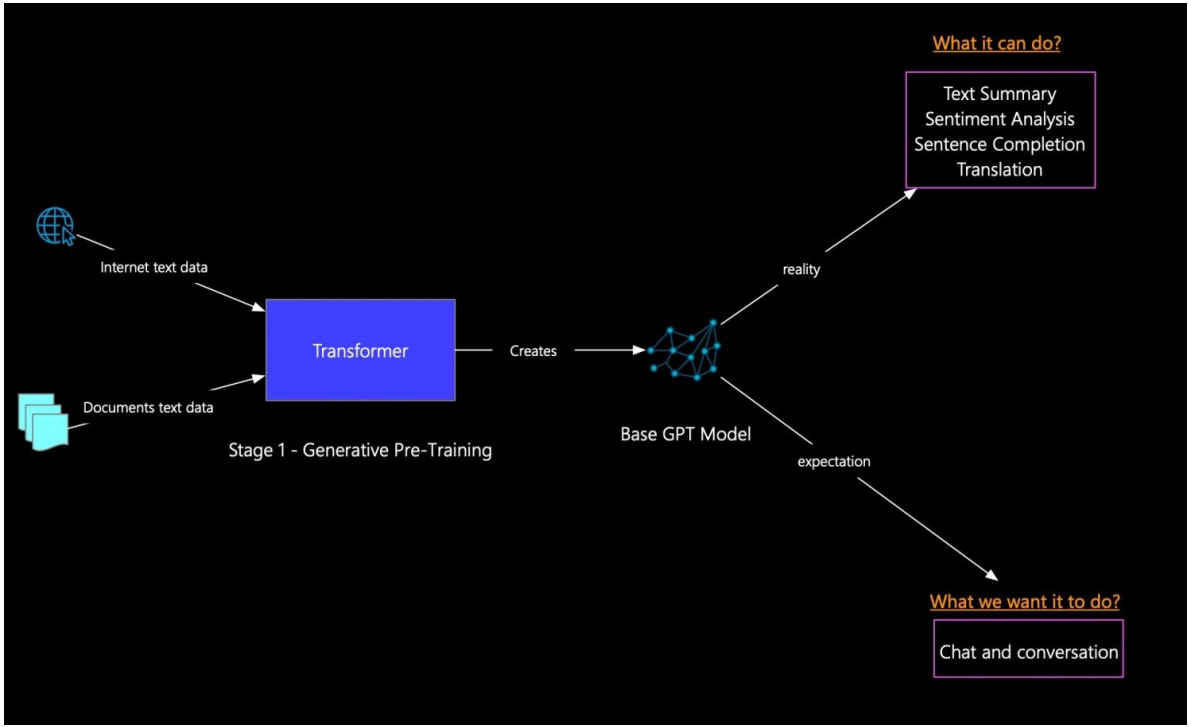
How ChatGPT was trained?

Internally using a LLM which is gpt-3.5 or gpt-4
It has trained on a large amount of data which is available all over the internet.

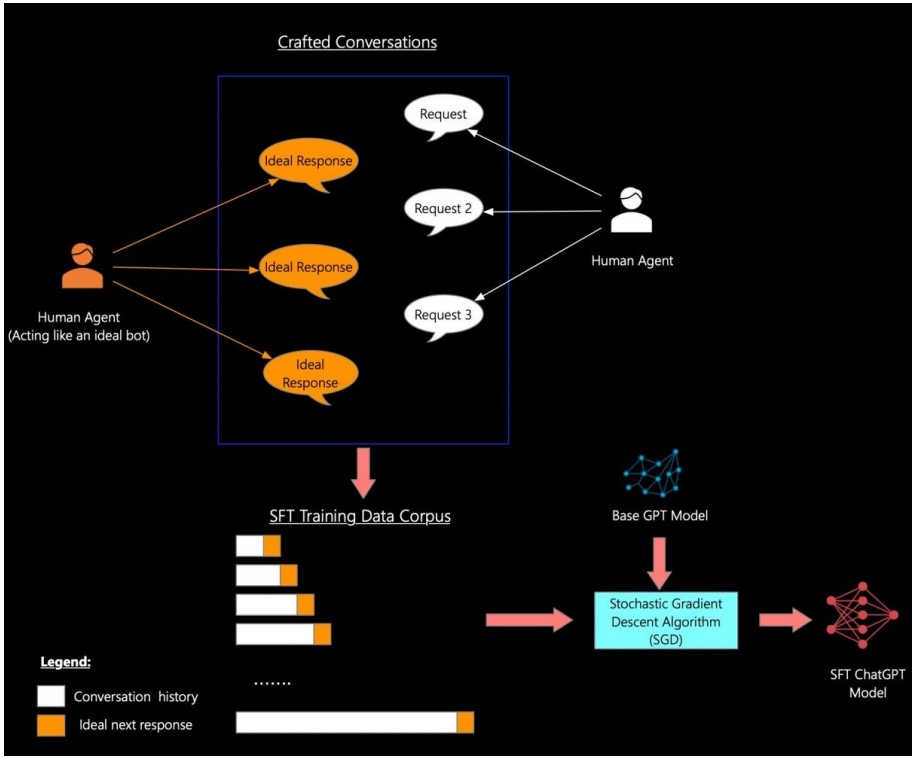
1. Generative pre-training
2. Supervised fine-tuning
3. Reinforcement learning


Internet text data
Documents text data
Stage 1 - Generative Pre-Training
This base model thingy (GPT) that was trained on a bunch of stuff from the Internet for a whole bunch of different things by using the Transformer Architecture.
Base GPT model
Stage 2 - Supervised Fine Tuning (SFT)
Next, with the human AI trainers, you get to have conversations where they play both sides - you and an AI assistant.
Fine-tuned ChatGPT model
Stage 3 - Reinforcement Learning through human feedback (RLHF)
Next, let's take the model to the next level by optimizing it even more with Reinforcement Learning by training it against a reward model.
ChatGPT model

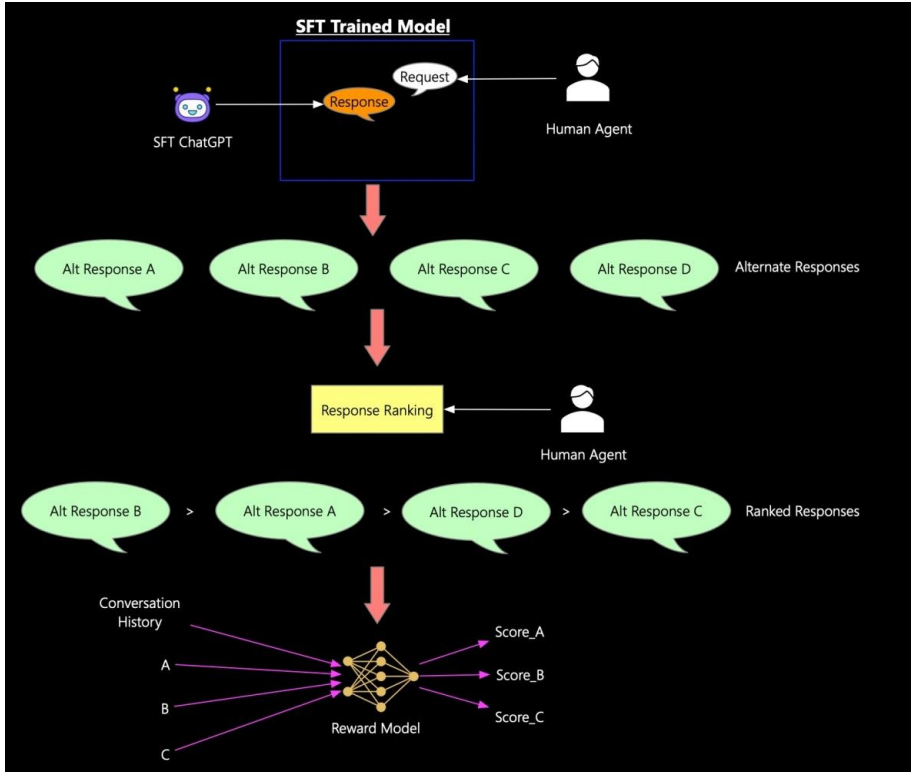
Generative Pre-Training



Supervised Fine-Tuning (SFT)



Reinforcement Learning through Human Feedback (RLHF)



Reference i used:
https://www.linkedin.com/pulse/discover-how-chatgpt-istrained-pradeep-menon/