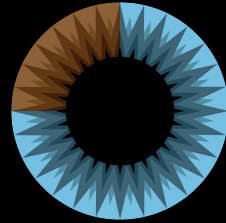


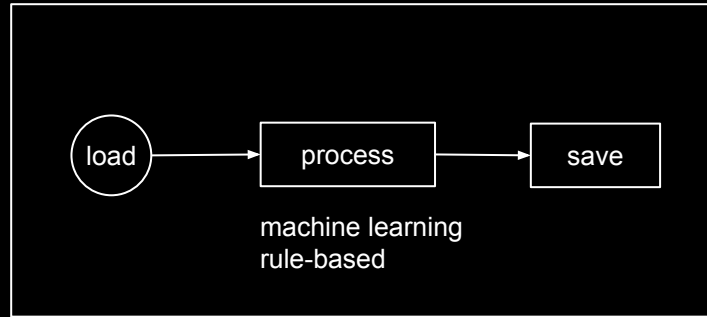
# MACHINE LEARNING

Highly recommended for  
background information



3Blue1Brown's YouTube Course on Neural  
Networks and Deep Learning

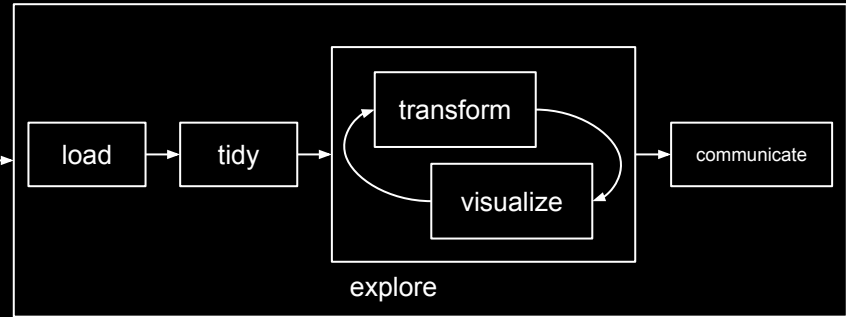
pre-process  
unstructured data



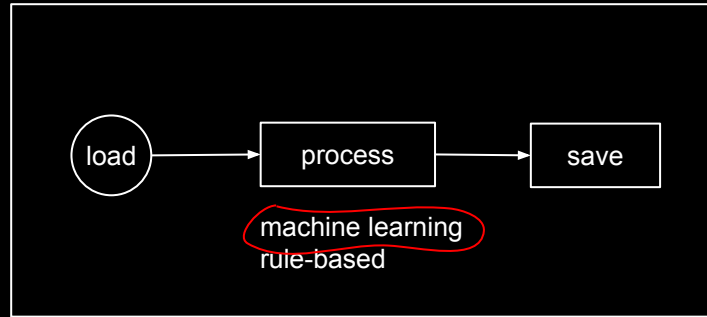
program



exploratory data  
analysis



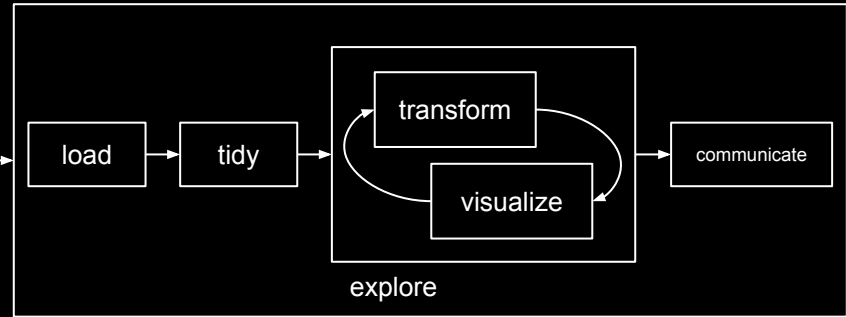
pre-process  
unstructured data



program



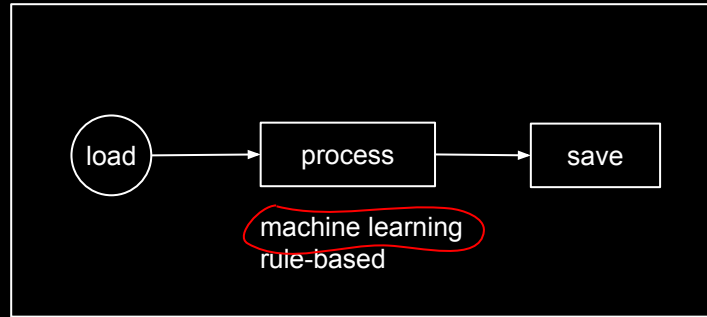
exploratory data  
analysis



program



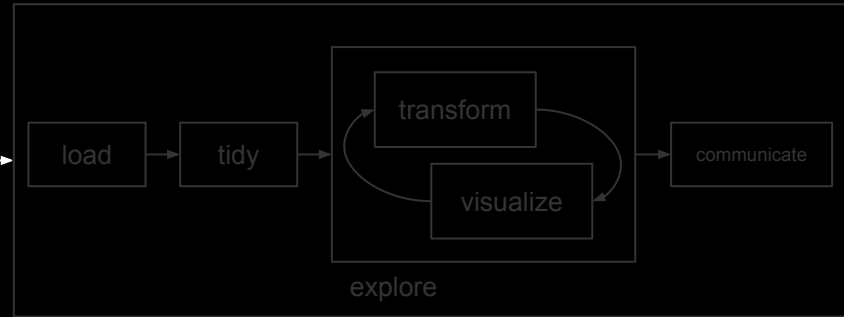
pre-process  
unstructured data



program



exploratory data  
analysis



program





machine learning

program



YouTube



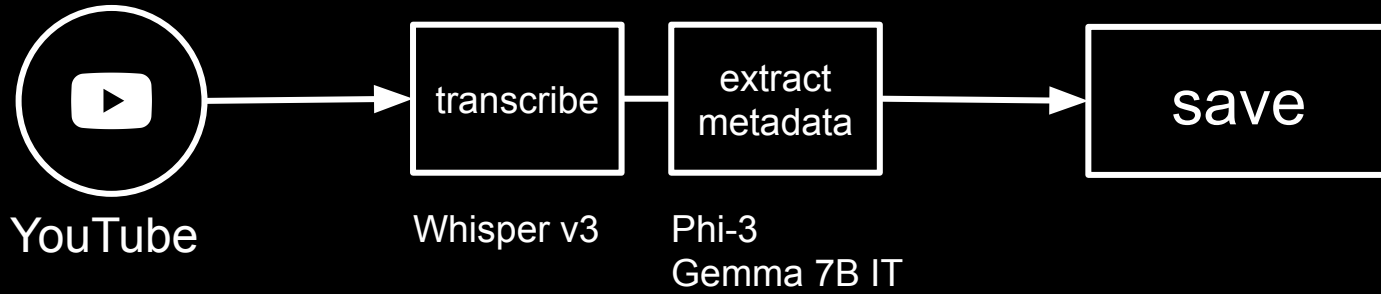
process

machine learning



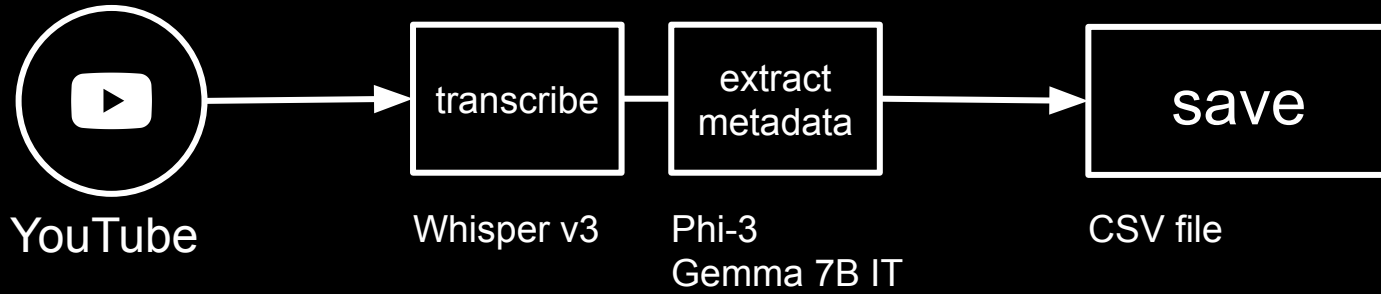
save

program



program





program

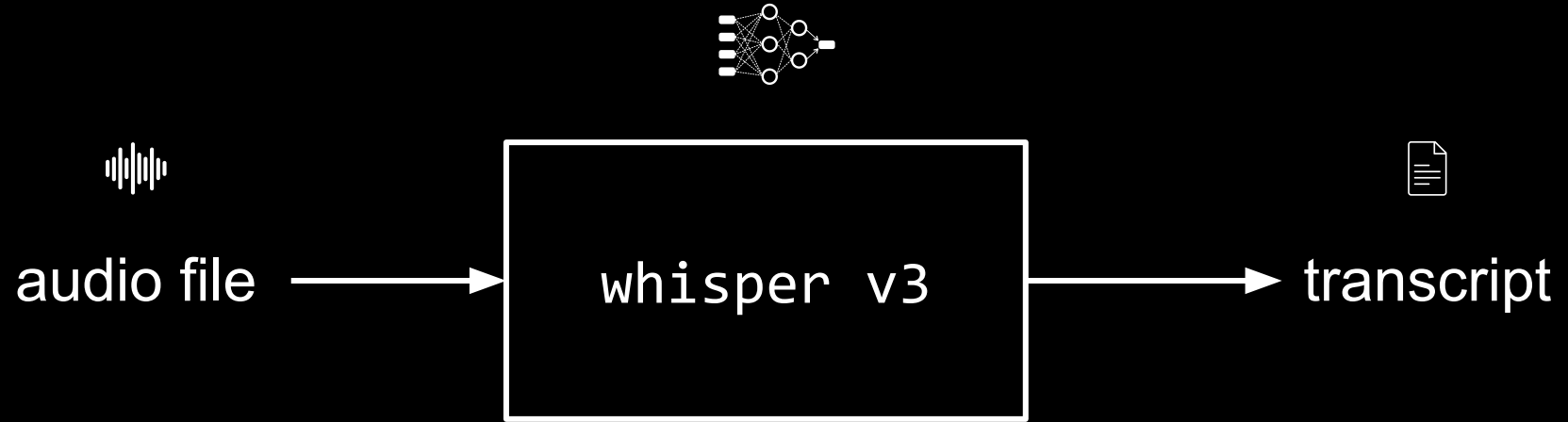
# YouTube API

# Whisper v3

<https://arxiv.org/abs/2212.04356>



<https://huggingface.co/openai/whisper-large-v3>



# Large Language Models (LLM)

what has been said so far?  
(*prompt / context*)

what has been said so far?  
(*prompt / context*)



prediction of next token based on  
learnt probability distribution



what has been said so far?  
(*prompt / context*)



prediction of next token based on  
learnt probability distribution

+

(randomness)

what has been said so far?  
(*prompt / context*)



prediction of next token based on  
learnt probability distribution

+

(randomness)

+

(filter)

(*discriminating, insulting content*)

what has been said so far?  
(*prompt / context*)



prediction of next token based on  
learnt probability distribution

+

(randomness)

+

(filter)

(*discriminating, insulting content*)

next word (*token*)



what has been said so far?  
(*prompt / context*)



prediction of next token based on  
learnt probability distribution

+

(randomness)

+

(filter)

(*discriminating, insulting content*)



next word (*token*)



# PROMPTING

<https://www.promptingguide.ai/>



elements of a prompt

<instruction>

<context>

<input data>

<output indicator>

elements of a prompt

<instruction>

<context>

<input data>

<output indicator>

example prompt

Explain the binary number system.



elements of a prompt

<instruction>

<context>

<input data>

<output indicator>

example prompt

Explain the binary number system.

start simple

## elements of a prompt

<instruction>

<context>

<input data>

<output indicator>

## example prompt

You are a friendly tutor and your task is to explain complex concepts as simple as possible.

Explain the binary number system.

## elements of a prompt

<instruction>

<context>

<input data>

<output indicator>

## example prompt

You are a friendly tutor and your task is to explain complex concepts as simple as possible.

Your answers are never longer than 10 sentences.

Explain the binary number system.

# ZERO-SHOT PROMPTING

## elements of a prompt

<instruction>

<context>

<input data>

<output indicator>

## example prompt

Classify the text into neutral,  
negative or positive.

Text: "What a great dinner!"

Sentiment:

## elements of a prompt

<instruction>

<context>

<input data>

<output indicator>

## example prompt

Classify the text into neutral,  
negative or positive.

Text: "What a great dinner!"

Sentiment:

this will be replaced with  
data later...

# FEW-SHOT PROMPTING

IN-CONTEXT LEARNING

## examples in the context to learn from

Extract all references to countries and their continent in the following text using the format from the examples below.

Example 1: "They played the team called 'Die Mannschaft' in the world cup final"

Correct answer: Germany, Europe

Example 2: "The Three Lions once again lost to Germany in a semi final"

Correct answer: England, Europe, Germany, Europe

Text: "The Selecao was destroyed 1:7 by the DFB selection in their home stadium."

Answer:



## examples in the context to learn from

Extract all references to countries and their continent in the following text using the format from the examples below.

Example 1: "They played the team called 'Die Mannschaft' in the world cup final"

Correct answer: Germany, Europe

Example 2: "The Three Lions once again lost to Germany in a semi final"

Correct answer: England, Europe, Germany, Europe

Text: "The Selecao was destroyed 1:7 by the DFB selection in their home stadium."

Answer:

more prompting strategies

chain-of-thought (CoT)

self-consistency

generate knowledge prompting

prompt chaining (subtasks)

tree-of-thoughts (ToT)

retrieval-augmented-generation (RAG)

...

# Phi-3

<https://arxiv.org/abs/2404.14219>



~~<https://huggingface.co/microsoft/Phi-3-mini-128k-instruct>~~

<https://huggingface.co/microsoft/Phi-3-medium-128k-instruct>

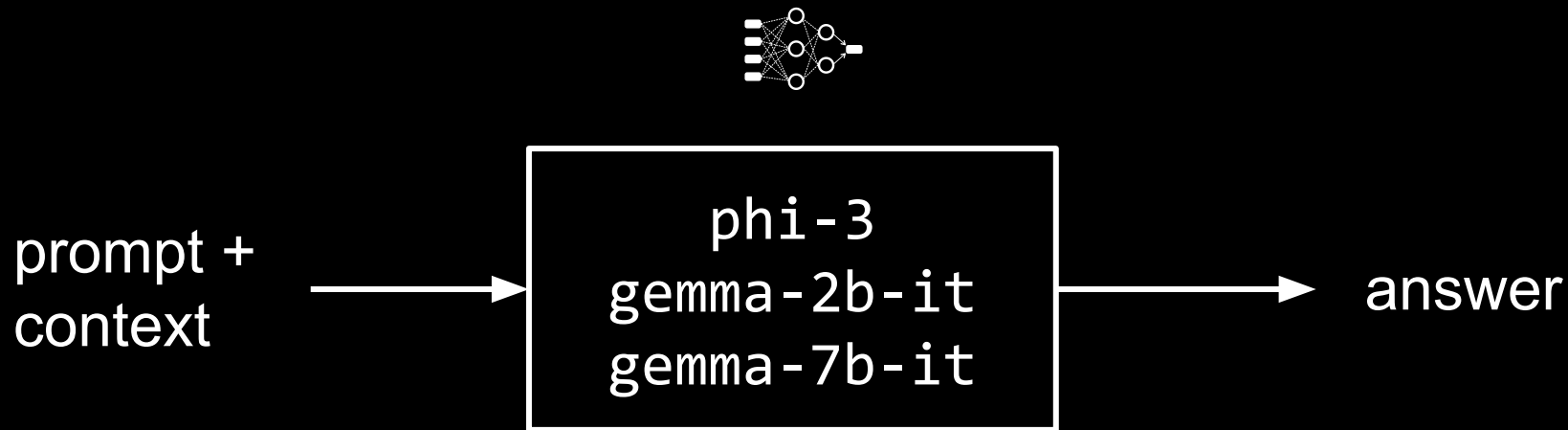
# Gemma 2B / 7B Instruct

<https://arxiv.org/abs/2403.08295>



<https://huggingface.co/google/gemma-2b-it>

<https://huggingface.co/google/gemma-7b-it>



OpenAI GPT-4o