TULU

Research They provided large set of
instruction tuned Models from **6.7B** to
65B parameter in size. **12 datasets**
and systematically evaluate

TULU — 87% of ChatGPT Performance
73% of GPT 4 Performance.

Instruction tuning - Training in supervised
Input / output pairs!

TULU — [a suite of 7B to 65B Llama
Models]
fine tuned on combination of data source.
& 7 popular available datasets

Instruction
& Datasets
(TULU)
① Created by researchers from existing
NLP Datasets

② Written by Humans from Scratch.
③ Generated by Proprietary Model

& Pretrained Models :

& Llama suite - a series of 6.7B to
65B Parameter
& OPT and Pythia Models hov.

Format of Datasets :-
Share that GPT format

Instruction Datasets:

$$\left\{ \left(x_1^j, y_1^j, x_2^j, y_2^j, \ldots x_i^j, y_i^j \right) \right\}_{j=1}^{N}$$

Comprising $\mp$ N tuples

x_i ~ user prompt

y_i — desired output

For most of the instances $\exists$ $i = 1$
train x^j to give y^j

But in case of conversation Datasets
to predict $\boxed{y_i^{\,j}}$ given some
conversation history

$$\left\{ x_1^j, y_1^j, x_2^j, y_2^j, x_3^j, y_3^j \ldots \right.$$
$$\left. x_i^j \right\}$$

✗ Only Decoder only Models

✗ Use teacher forcing with loss
     masking to mask all the
tokens belonging to the input sequence x_i

Given X $\longrightarrow$ tokens belonging to input

Y $\longrightarrow$ target tokens.

Loss function:

$$L = -\sum_{j} \log P_\theta \left(t_j \mid t_{<j} \right) \times$$

$$\begin{cases} 1 & \text{if } t_j \in \\ 0 & \text{otherwise} \end{cases}$$

$\boxed{t_j}$ $\longrightarrow$ j^{th} input token [belonging to
      X or Y]

Resources Combined: * Human Data Mixture
                    * Human + GPT Data
                                  Mixture.

LLama Models + { Human & GPT
                  Data Mixture } =

(TULU) => Hybrid Camel resulting

from inter breeding between different
        species.

Evaluation of TULU :

① Factual knowledge   ② Reasoning
③ Multi linguality   ④ Coding
⑤ Oper ended Instruction following

Limitations:
TULU - does not evaluate n
    Multi turn dialogue aboilities
    nor their summarization aboilities.