MTS AI

Cotype Nano

A.- B. Gazzaev, NLP researcher

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Agenda

01 LLMs & SMLs

02 1 stage SFT

03 2 stage SFT

04 Datasets

05 Evaluation

06 Quantization

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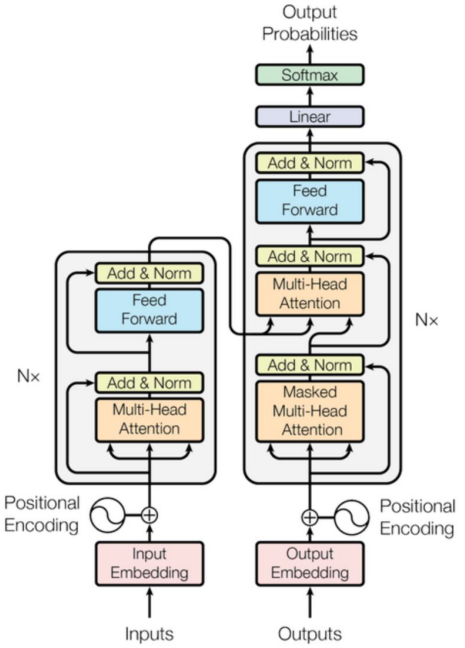
01

LLMs and SLMs

LLMs and SLMs

BERT

Encoder



GPT

Decoder

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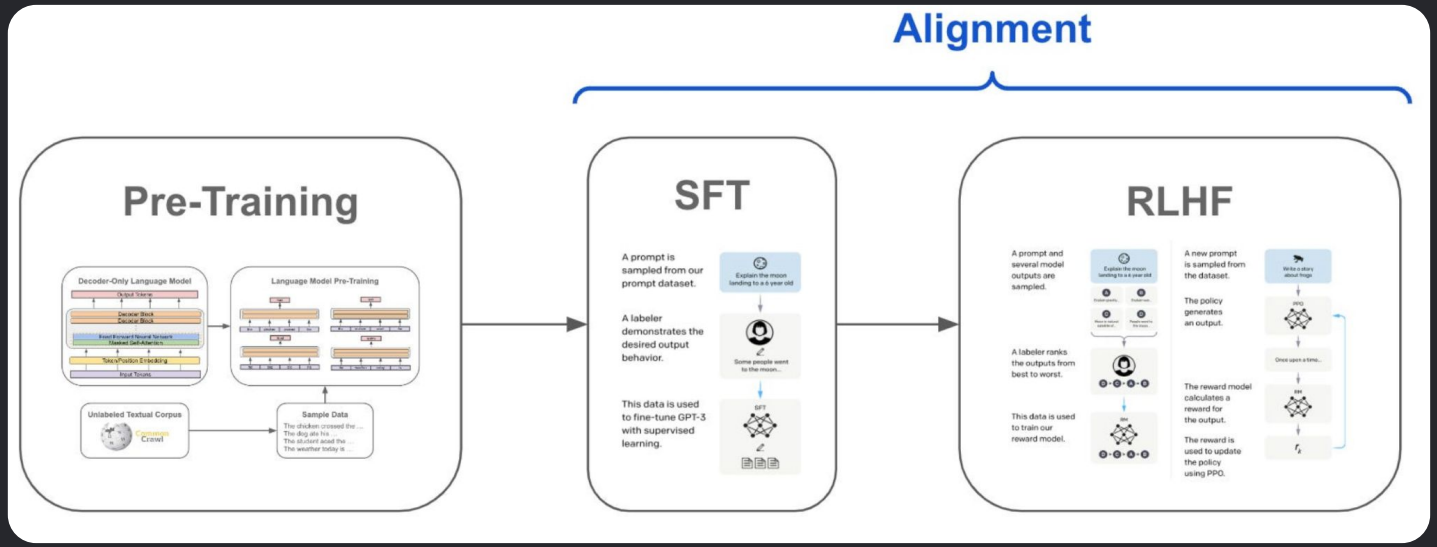
02

One-stage SFT🤗


Alignment
Pre-Training
Decoder-Only Language Model
Language Model Pre-Training
Unlabeled Textual Corpus
Sample Data
SFT
A prompt is sampled from our prompt dataset.
A labeler demonstrates the desired output behavior.
This data is used to fine-tune GPT-3 with supervised learning.
RLHF
A prompt and several model outputs are sampled.
A labeler ranks the outputs from best to worst.
This data is used to train our reward model.
A new prompt is sampled from the dataset.
The policy generates an output.
The reward model calculates a reward for the output.
The reward is used to update the policy using PPO.

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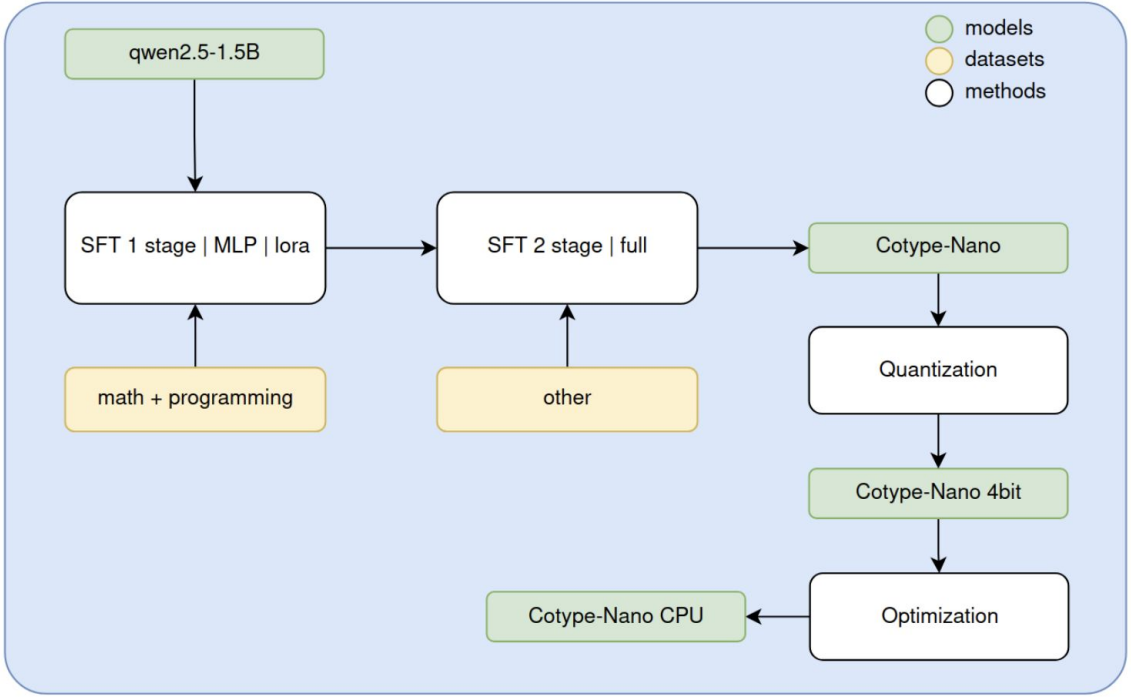
03

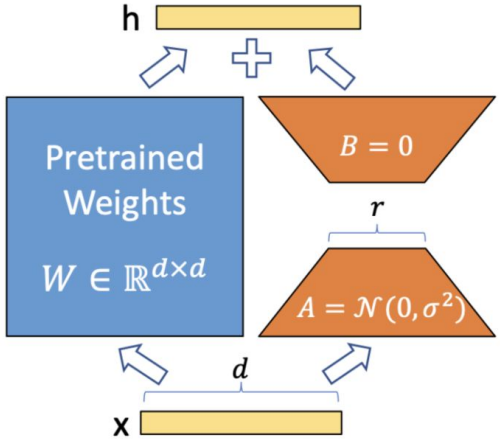
Two-stage SFT🤗

Two-stage SFT



Пайплайн обучения

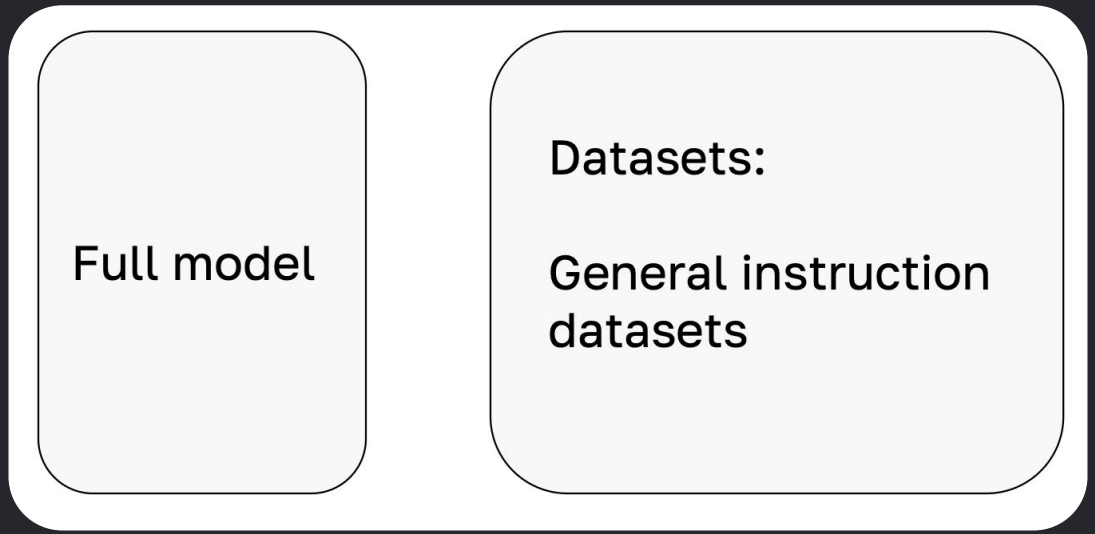
Two-stage SFT. Stage 1



Datasets:

Math (200k)
Programming (~50k)

Two-stage SFT. Stage 2



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Dataset

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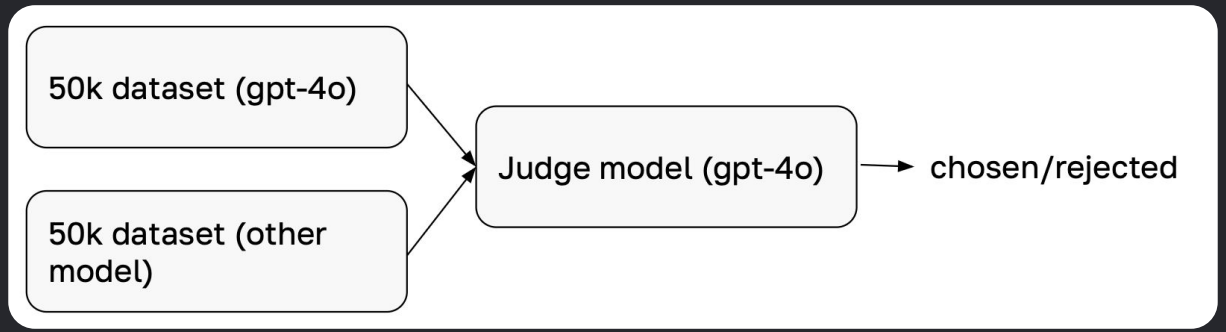
microsoft / orca-math-word-problems-200k

Internal programming dataset

Internal INST dataset + part of open source datasets


50k dataset (gpt-4o)
50k dataset (other model)
Judge model (gpt-4o)
chosen/rejected

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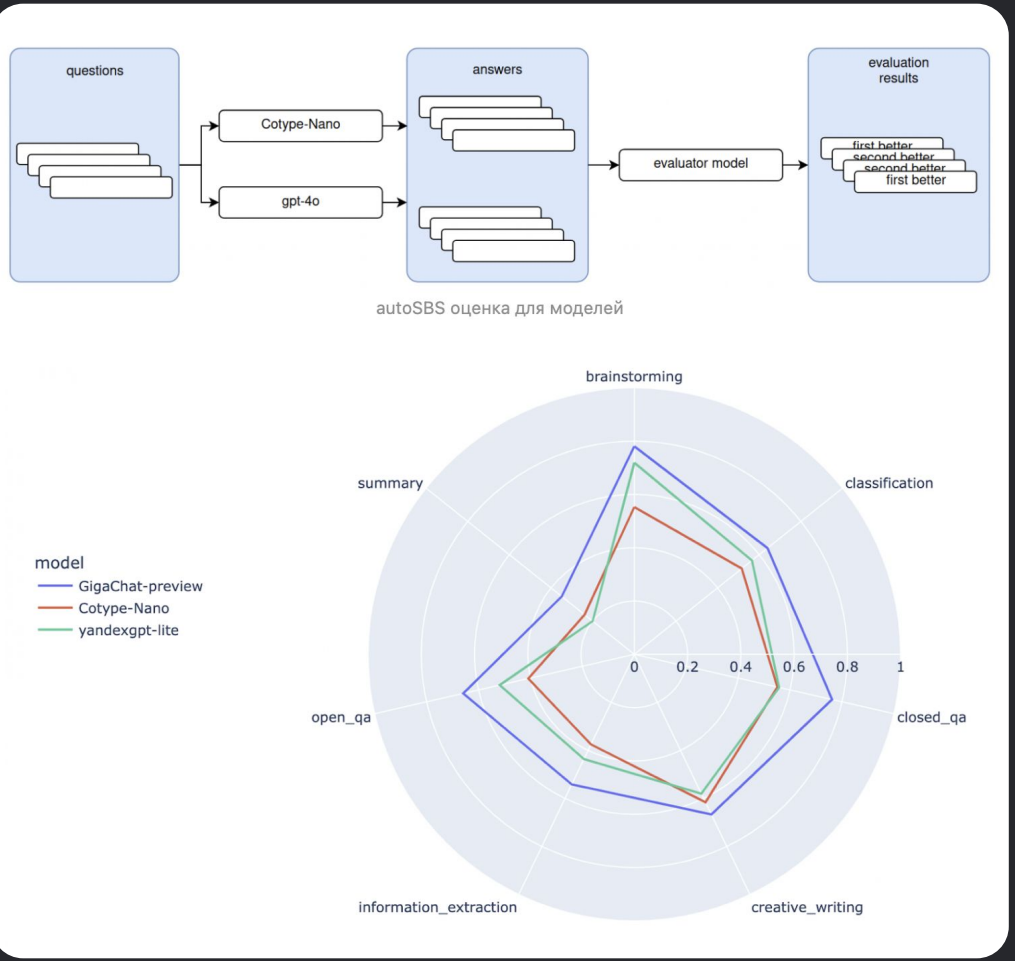
05

Evaluation 


questions
Cotype-Nano
gpt-4o
answers
evaluator model
evaluation results
first better
second better
second better
first better
autoSBS оценка для моделей
model
GigaChat-preview
Cotype-Nano
yandexgpt-lite
brainstorming
classification
closed_qa
creative_writing
information_extraction
open_qa
summary
0
0.2
0.4
0.6
0.8
1

Локальная автооценка с помощью gpt-4

Model	Score	95% CI	Avg. #Tokens
Cotype-Nano	**30.2**	**(-1.3, 2.2)**	**542**
vikhr-it-5.3-fp16-32k	27.8	(-2.1, 1.5)	519
vikhr-it-5.3-fp16	22.7	(-1.7, 1.8)	523
Cotype-Nano 4bit	**22.5**	**(-1.4, 2.1)**	**582**
storm-7b	20.6	(-1.6, 1.7)	419
Vikhrmodels-Vikhr-Llama-3.2-1B-instruct	19.4	(-1.6, 1.3)	958
neural-chat-7b-v3-3	19.0	(-1.6, 1.6)	927
gigachat_lite	17.2	(-1.4, 1.7)	276
Vikhrmodels-vikhr-qwen-1.5b-it	13.1	(-1.1, 1.1)	2495
meta-llama-Llama-3.2-1B-Instruct	4.0	(-0.6, 0.8)	1240

Ru llm arena

MTSAIR-Cotype-Nano-Uncensored	50.51
sfr-iterative-dpo-llama-3-8b-r	50.06
gpt-3.5-turbo-0125	50
glm-4-9b-chat	49.75
c4ai-command-r-v01	48.95
-ruadapt_llama3_extended_gm_ft_v5d1	48.16
-kolibri-mistral-0427-upd	47.91
-ruadapt_llama3_8b_instruct_extended_lep_ft-externa	47.81
MTSAIR-Cotype-Nano	47.74
llama-3-instruct-8b-sppo-iter3	47.45
-ruadapt_saiga_v7_lep_ft_external_infer	47.36
Vikhrmodels-Vikhr-Qwen-2.5-1.5b-Instruct	47.23

Ru llm arena

MTSAIR-Cotype-Nano-1B-v2	36.77
aya-23-8b	36.26
meta-llama-3-8b-instruct	35.07
openchat-3.5-0106	33.79
mistral-7b-instruct-v0.3	32.92
vikhr-it-5.2-fp16-cp	31.74
gigachat_pro	31.37
Vikhrmodels-Vikhr-Llama-3.2-1B-instruct	19.04
gigachat_lite	17.2
Vikhrmodels-Vikhr-Qwen-2.5-0.5b-Instruct	16.5

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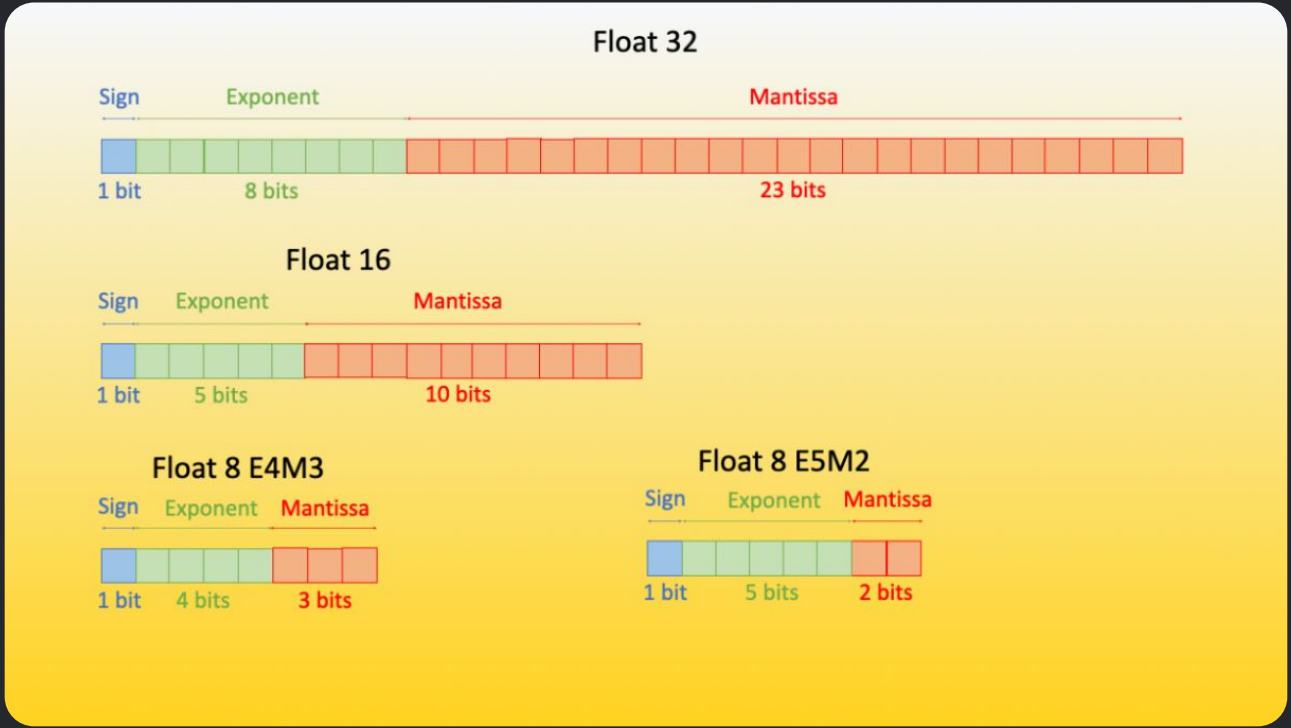
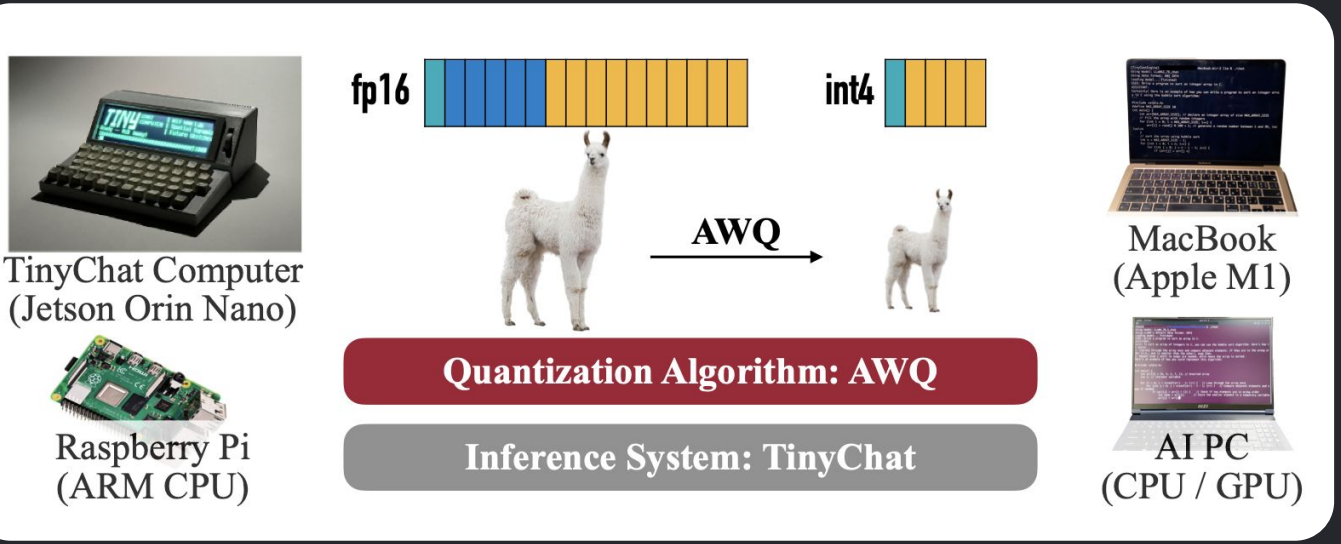
Quantization

Pre-training quantization



Post-training quantization



Post-training quantization

MTSAIR/MultiVerse_70B_AWQ

MTSAIR/multi_verse_model_GPTQ

Thank you for your attention