

# Phi-3 model

## Phi-3 model

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## Demonstration environment

**Development Board:** Raspberry Pi 500

**SD(TF)card:** 32G (Above 16G, the larger the capacity, the more models can be experienced)

Raspberry Pi 500 (8G RAM): Run 8B and below parameter models

Phi-3 is a powerful and cost-effective Small Language Model (SLM) launched by Microsoft, which outperforms models of the same size and higher in various language, inference, coding, and mathematical benchmarks.

## Model scale

Model	Parameter
Phi-3 (Mini)	3.8B
Phi-3 (Medium)	14B

Raspberry Pi 500 (8G RAM): Test Phi-3 model with 3.8B parameters!

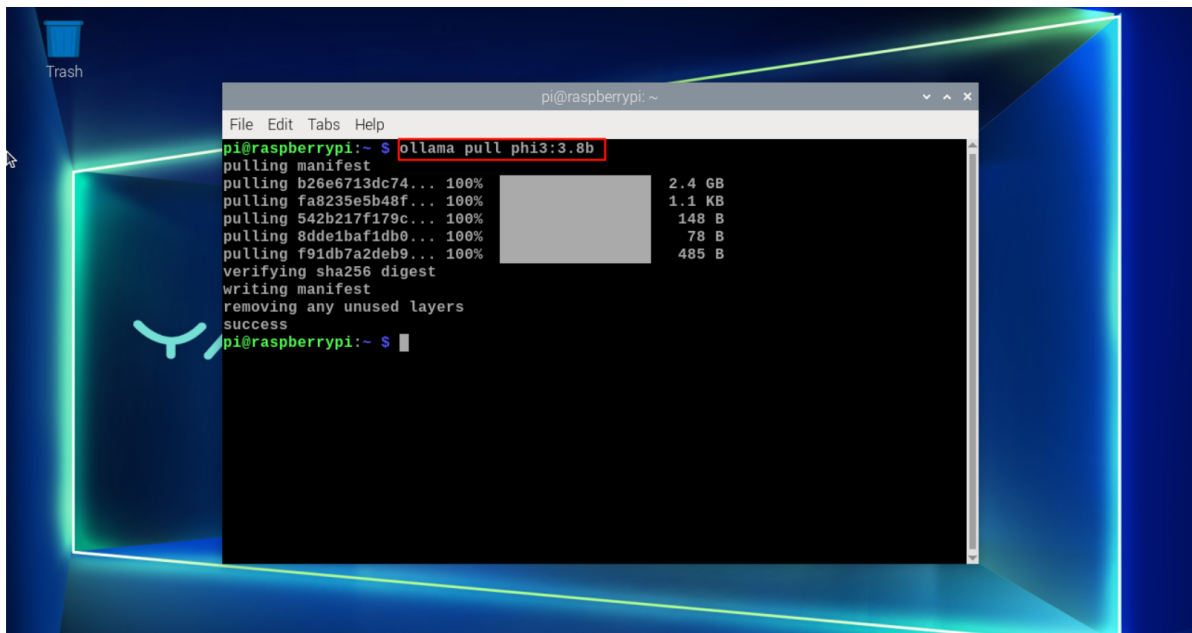
## Performance performance

Category	Benchmark	Phi-3				Gemma-7b	Mistral-7b	Mixtral-8x7b	Llama-3-8B-In	GPT3.5-Turbo-1106	Claude-3 Sonnet
		Phi-3-Mini-4K-In	Phi-3-Mini-128K-In	Phi-3-Small (Preview)	Phi-3-Medium (Preview)						
Popular Aggregate Benchmarks	AGI Eval (0-shot)	37.5	36.9	45	48.4	42.1	35.1	45.2	42	48.4	48.4
	MMLU (5-shot)	68.8	68.1	75.6	78.2	63.6	61.7	70.5	66.5	71.4	73.9
	BigBench Hard (0-shot)	71.7	71.5	74.9	81.3	59.6	57.3	69.7	51.5	68.3	--
Language Understanding	ANLI (7-shot)	52.8	52.8	55	58.7	48.7	47.1	55.2	57.3	58.1	68.6
	HellaSwag (5-shot)	76.7	74.5	78.7	83	49.8	58.5	70.4	71.1	78.8	79.2
Reasoning	ARC Challenge (10-shot)	84.9	84	90.7	91	78.3	78.6	87.3	82.8	87.4	91.6
	ARC Easy (10-shot)	94.6	95.2	97.1	97.8	91.4	90.6	95.6	93.4	96.3	97.7
	BoolQ (0-shot)	77.6	78.7	82.9	86.6	66	72.2	76.6	80.9	79.1	87.1
	CommonsenseQA (10-shot)	80.2	78	80.3	82.6	76.2	72.6	78.1	79	79.6	82.6
	MedQA (2-shot)	53.8	55.3	58.2	69.4	49.6	50	62.2	60.5	63.4	67.9
	OpenBookQA (10-shot)	83.2	80.6	88.4	87.2	78.6	79.8	85.8	82.6	86	90.8
	PIQA (5-shot)	84.2	83.6	87.8	87.7	78.1	77.7	86	75.7	86.6	87.8
	Social IQA (5-shot)	76.6	76.1	79	80.2	65.5	74.6	75.9	73.9	68.3	80.2
	TruthfulQA (MC2) (10-shot)	65	63.2	68.7	75.7	52.1	53	60.1	63.2	67.7	77.8
	WinoGrande (5-shot)	70.8	72.5	82.5	81.4	55.6	54.2	62	65	68.8	81.4
Factual Knowledge	TriviaQA (5-shot)	64	57.1	59.1	75.6	72.3	75.2	82.2	67.7	85.8	65.7
Math	GSM8K Chain of Thought (0-shot)	82.5	83.6	88.9	90.3	59.8	46.4	64.7	77.4	78.1	79.1
Code generation	HumanEval (0-shot)	59.1	57.9	59.1	55.5	34.1	28	37.8	60.4	62.2	65.9
	MBPP (3-shot)	53.8	62.5	71.4	74.5	51.5	50.8	60.2	67.7	77.8	79.4

## Got Phi-3

Using the pull command will automatically pull the models from the Ollama model library.

```
ollama pull phi3:3.8b
```



## Use Phi-3

## Run Phi-3

If the system does not have a running model, the system will automatically obtain the Phi-3 3.8B model and run it: **The Pi500\_AI\_Pure image does not provide this model!**

```
ollama run phi3:3.8b
```

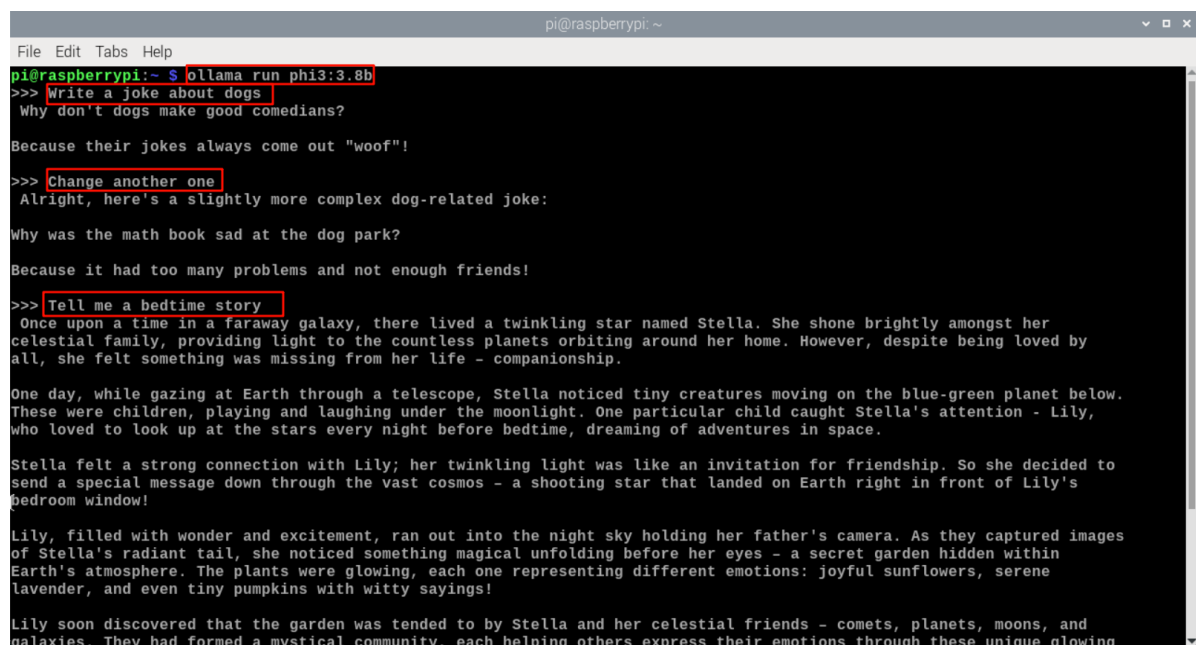
## Dialogue

write a joke about dogs

Change another one

Tell me a bedtime story

The time to reply to the question is related to the hardware configuration, please be patient.



```
pi@raspberrypi: ~  
File Edit Tabs Help  
pi@raspberrypi:~$ ollama run phi3:3.8b  
>>> Write a joke about dogs  
Why don't dogs make good comedians?  
Because their jokes always come out "woof!"  
>>> Change another one  
Alright, here's a slightly more complex dog-related joke:  
Why was the math book sad at the dog park?  
Because it had too many problems and not enough friends!  
>>> Tell me a bedtime story  
Once upon a time in a faraway galaxy, there lived a twinkling star named Stella. She shone brightly amongst her celestial family, providing light to the countless planets orbiting around her home. However, despite being loved by all, she felt something was missing from her life - companionship.  
One day, while gazing at Earth through a telescope, Stella noticed tiny creatures moving on the blue-green planet below. These were children, playing and laughing under the moonlight. One particular child caught Stella's attention - Lily, who loved to look up at the stars every night before bedtime, dreaming of adventures in space.  
Stella felt a strong connection with Lily; her twinkling light was like an invitation for friendship. So she decided to send a special message down through the vast cosmos - a shooting star that landed on Earth right in front of Lily's bedroom window!  
Lily, filled with wonder and excitement, ran out into the night sky holding her father's camera. As they captured images of Stella's radiant tail, she noticed something magical unfolding before her eyes - a secret garden hidden within Earth's atmosphere. The plants were glowing, each one representing different emotions: joyful sunflowers, serene lavender, and even tiny pumpkins with witty sayings!  
Lily soon discovered that the garden was tended to by Stella and her celestial friends - comets, planets, moons, and galaxies. They had formed a mystical community, each helping others express their emotions through these unique glowing
```

## End conversation

You can end the conversation by using the shortcut key 'Ctrl+d' or '/bye'.

```
pi@raspberrypi: ~  
File Edit Tabs Help  
celestial family, providing light to the countless planets orbiting around her home. However, despite being loved by  
all, she felt something was missing from her life - companionship.  
  
One day, while gazing at Earth through a telescope, Stella noticed tiny creatures moving on the blue-green planet below.  
These were children, playing and laughing under the moonlight. One particular child caught Stella's attention - Lily,  
who loved to look up at the stars every night before bedtime. dreaming of adventures in space  
  
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of Stella's radiant tail, she noticed somethin  
Earth's atmosphere. The plants were glowing, e  
lavender, and even tiny pumpkins with witty sa  
  
Lily soon discovered that the garden was tende  
galaxies. They had formed a mystical community  
plants. The garden provided not only a beautifi  
  
Thrilled with the discovery, Lily spent her ni  
friends. As she grew older, Stella's light bec  
friendships, and nurture compassion towards al  
  
And so, the bond between Earth and Stella cont  
mission to spread kindness throughout the gala  
stars.  
  
The End.  
  
>>> /bye  
pi@raspberrypi:~ $
```

```
pi@raspberrypi: ~  
File Edit Tabs Help  
pi@raspberrypi:~ $ ollama run phi3:3.8b  
>>>  
Use Ctrl + d or /bye to exit.  
>>>  
pi@raspberrypi:~ $
```

## Reference material

### Ollama

Website: <https://ollama.com/>

GitHub: <https://github.com/ollama/ollama>

### Phi-3

Ollama corresponding model: <https://ollama.com/library/phi3>