

## **Module 3 - Topic 1**

### **3.1.1 What is Finetuning?**



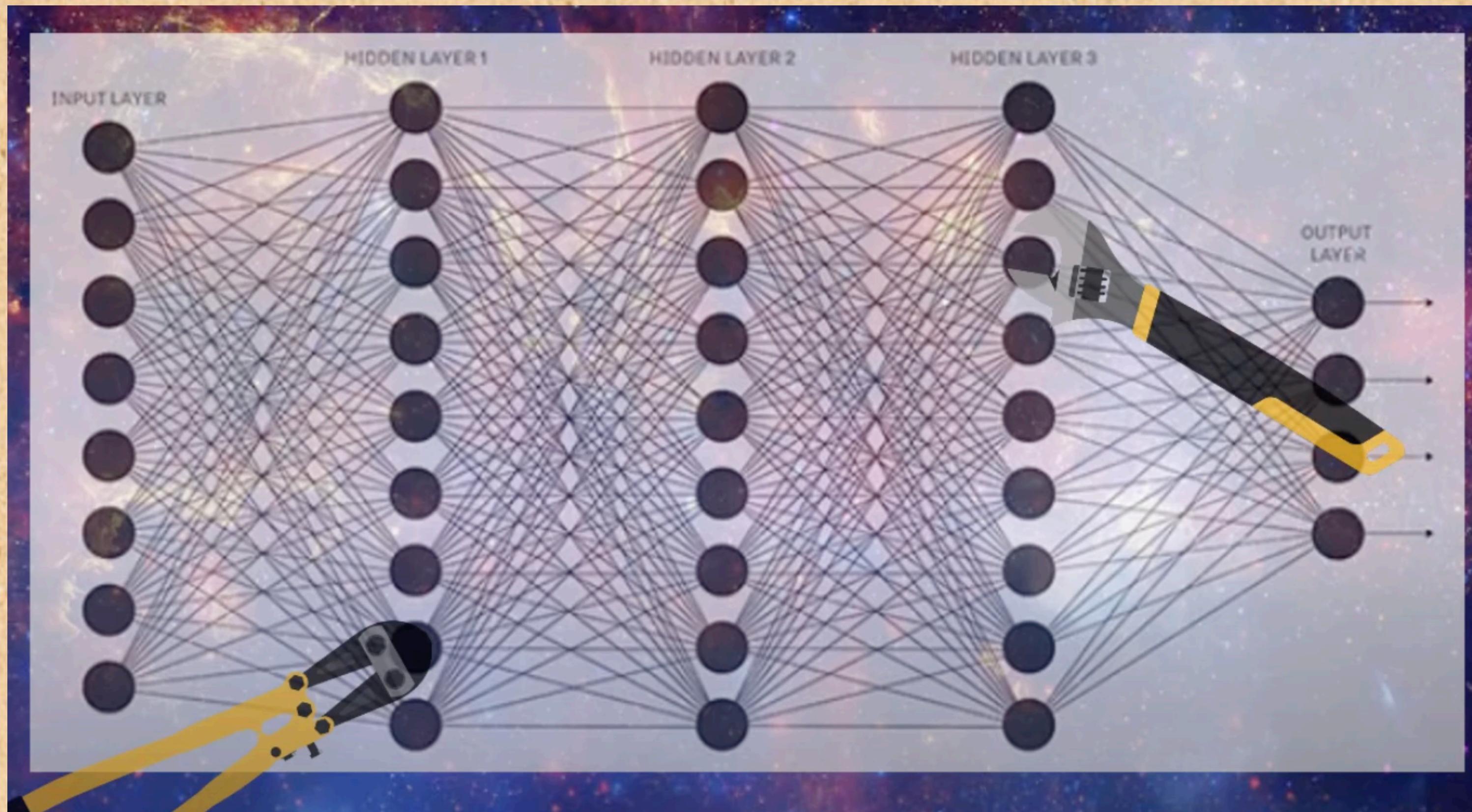
# What is fine-tuning?

Process of taking a pre-trained model and "fine-tuning" its parameters on a dataset relevant to the particular task.

- Uses task-specific data to adjust model parameters
- Builds upon existing knowledge and capabilities
- Aims to improve performance on targeted tasks

# What is fine-tuning?

Tweaking the LLM parameters to make to more suitable for the task!



# Why fine-tune?

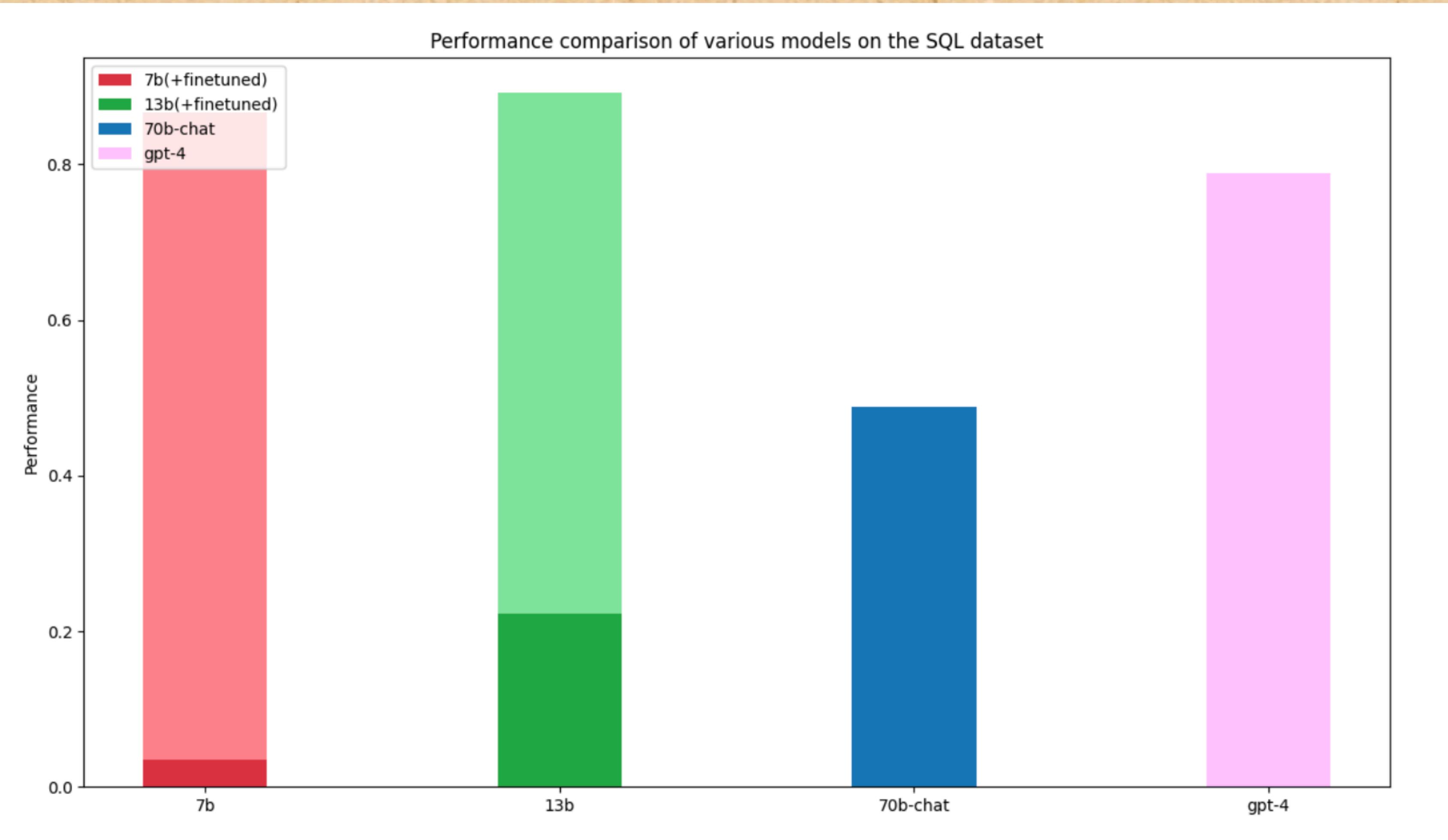
**Improved Performance:** Fine-tuned models often outperform general models on specific tasks.

**Reduced Training Time:** Significantly cuts down time and resources compared to training from scratch.

**Better Generalization:** Helps the model learn domain nuances, improving understanding and generation.

**Resource Efficiency:** Allows smaller entities to leverage powerful models without extensive resources.

# Why fine-tune?



# Benefits of Fine-tuning

## 9 Reasons to Train Your Own LLM



### 1. Data Privacy



Data stays inside VPC or on premise  
Stop data leaking to competitors  
No 3rd party data breaches

### 2. Ownership



Your engineering team builds it  
No recurring professional services  
Build AI moat & in-house know-how

### 3. Better Performance



Consistent outputs  
Stop hallucinating  
Stop suggesting your competitors

### 4. Flexibility



Control LLM providers  
Choice over open-source LLMs  
Adapt LLM stack to custom needs

### 5. Cost



Lower cost per API hit  
Control cost  
Cost transparency

### 6. Uptime



Control uptime  
Stop fighting for usage with others  
Avoid 3rd party outages

### 7. Latency



Lower latency  
Higher throughput  
Control over latency

### 8. Content Control



Stop inappropriate content  
Stop unlicensed content  
Your own data - data transparency

### 9. Bias



Control biases with your own data  
Unlearn biases with unbiased data



# With finetuning, you can do a lot more!

- Optimize for specific task
  - Implement guardrails
  - Maintain a certain character
  - Getting structured outputs
  - Embed domain knowledge
- .....

# With finetuning, you can do a lot more!

Use Case	Example
Optimize for specific tasks	Code generation; Text summarization
Maintain a certain character	Chatbot speaking like a friendly librarian; AI assistant with a YOUR tone
Guardrails	Refusing to generate harmful content; Ensuring privacy protection
Getting structured outputs	Generating slides in desired format; Producing responses in JSON format;
Embed domain knowledge	Discussing advanced medical terminology; Providing expert-level financial advice

**How do we do all these?**

**Instruction Tuning!**