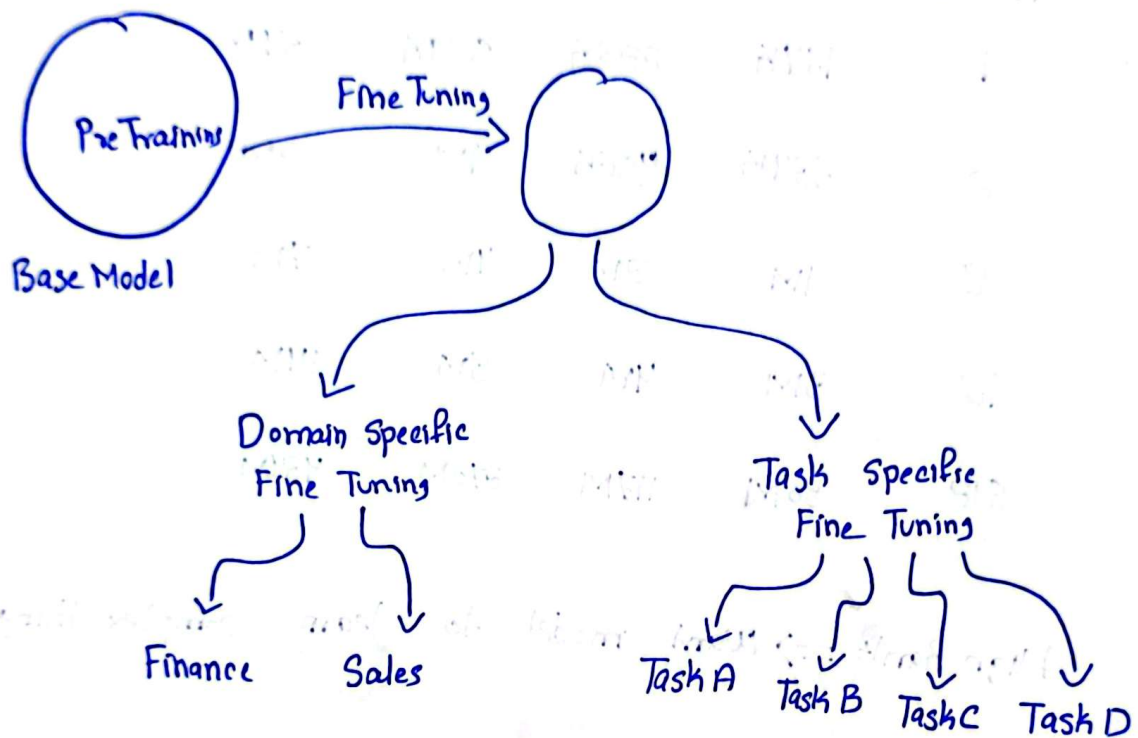


LoRA and QLoRA

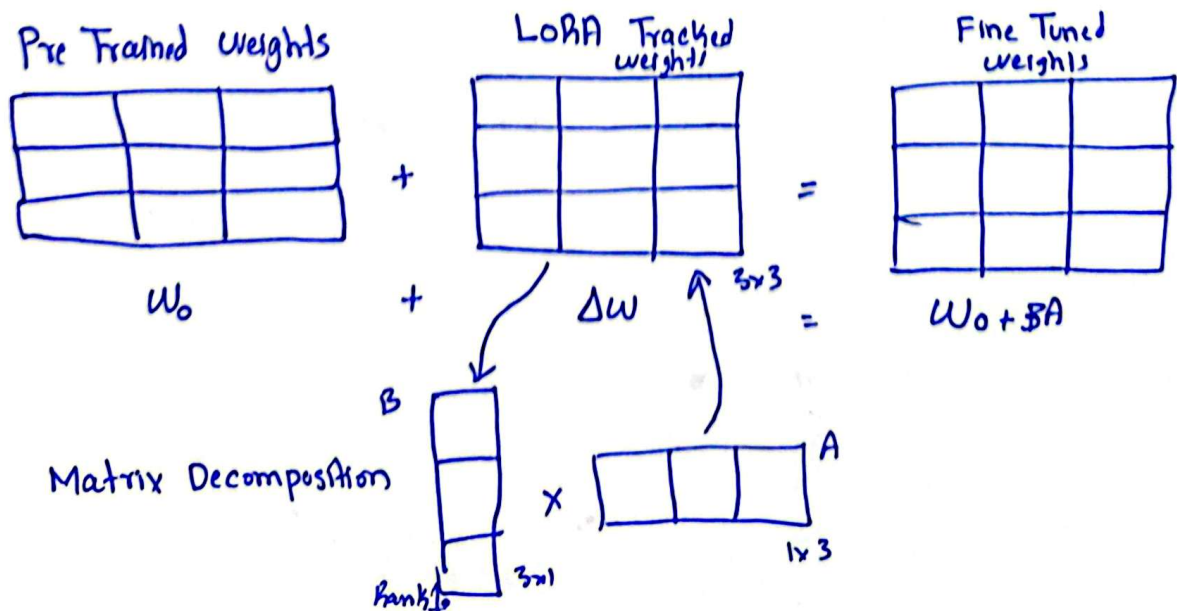


Full Parameter Fine Tuning

- ① Update all model weights (175 B)
 - ② Hardware Resource Constraints
- } challenges

→ LoRA

Instead of updating weights, it track changes



> No. of Trainable Parameters

Rank	7B	13B	70B	180B
1	167K	228K	529K	849K
2	334K	456K	1M	2M
8	1M	2M	4M	7M
16	3M	4M	8M	14M
512	86M	117M	270M	434M

High Rank \Rightarrow Want model to learn complex things