IdeaWeaver

Building Small Language Model from Scratch

A 4-Week Hands-On Program

WEEK 1 – PyTorch & Neural Networks

Build a strong foundation in PyTorch and neural networks. Understand tensors, forward passes, backward passes, and training loops.

Hands-on: Implement and train a simple neural network using PyTorch.

WEEK 2 – Tokenizers & Positional Encoding

Learn how raw text is converted into tokens and why tokenization matters. Explore positional encoding techniques used in transformer models.

Hands-on: Experiment with different tokenizers and positional encodings.

WEEK 3 – Attention Mechanisms & KV Cache

Deep dive into attention, self-attention, and key-value caching. Understand how modern LLMs optimize inference performance.

Hands-on: Implement attention concepts and observe the impact of KV cache.

WEEK 4 – Building a Small Language Model (SLM) from Scratch

Bring everything together by building a small language model from scratch. Learn model architecture, training workflows, and real-world constraints.

Hands-on: Build, train, and evaluate a small language model end to end.