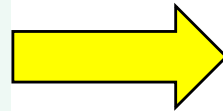# Why Assignments Are Too Easy?
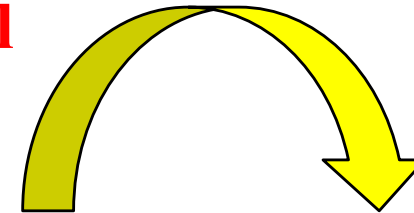
A: It's intentional. To provide hands-on seeds, so as to start using tools (MPI, OpenMP, CUDA, DPC++, *etc.*, or other mathematical & engineering tools at large) in a self-sustained use-learn cycle

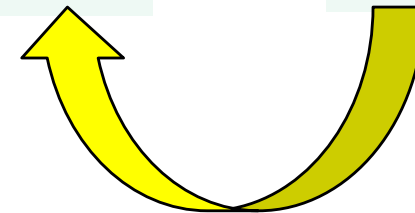### Most effective way to learn a new tool

Understand the smallest set of essential mechanisms by reading a **minimalist program**

→

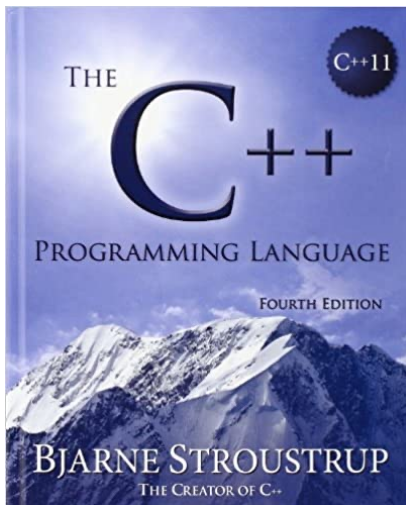Use the toolkit to solve **one's own problem**

Expand the toolkit by adding

Self-sustained Use-learn cycle
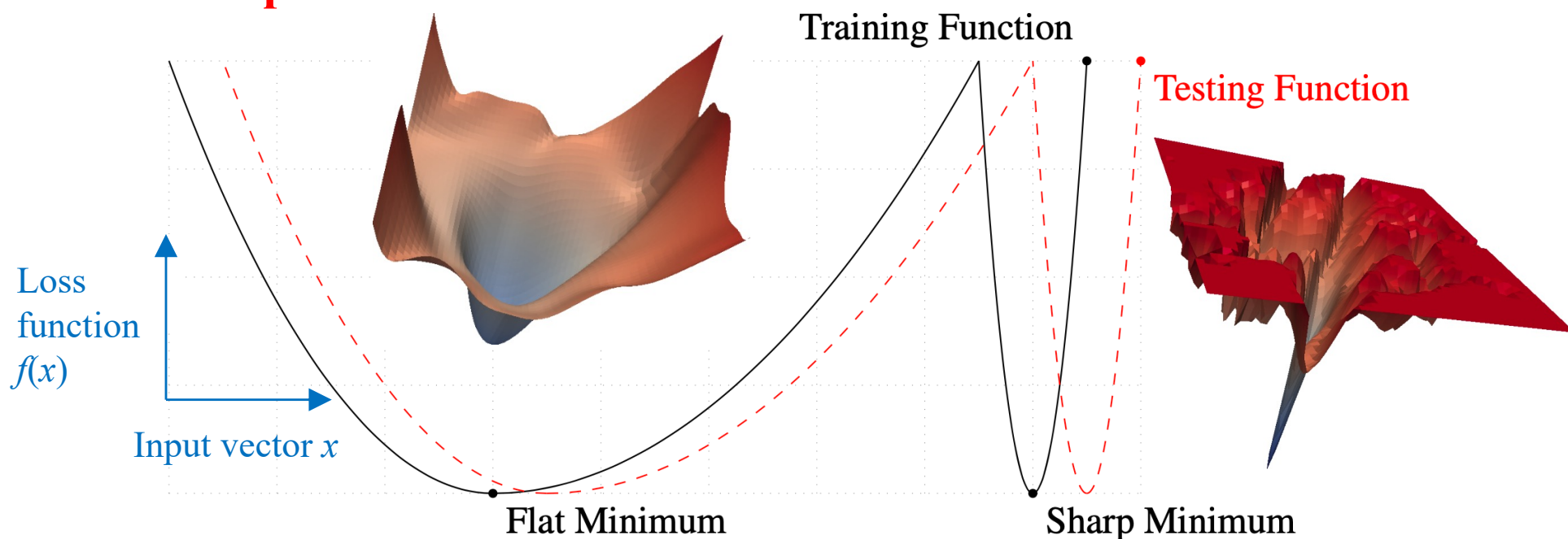
Start the cycle in your final project

Alternative way

"You bought a 1300+ page (480K+ word) book for $40 or $60, not a subscription service. How much support do you expect?"

Learning-Theory Foundation

- **Minimum description length (MDL) theory:** Models described by fewer bits (*i.e.*, low Kolmogorov complexity) are more generalizable

- **Spectral theory:** Low-bit (low-complexity) models have flatter loss landscape

Keskar *et al.*, ICLR 2017 [https://arxiv.org/abs/1609.04836]
Forest et al., ICLR 2021 [https://arxiv.org/abs/2010.01412]

H. Ibayashi *et al.*, *ISC23—LNCS* 13948, 223 ('23); *arXiv*: 2303.08169

https://github.com/mir-group/allegro