

Why Assignments Are Too Easy?

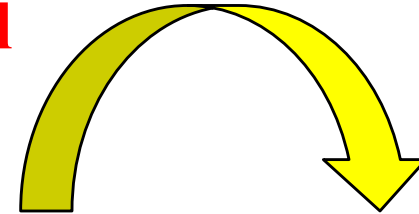
A: It's intentional. To provide hands-on seeds, so as to start using tools (MPI, OpenMP, CUDA, SYCL, *etc.*, or other mathematical & engineering tools at large) in a self-sustained use-learn cycle

Most effective way to learn a new tool

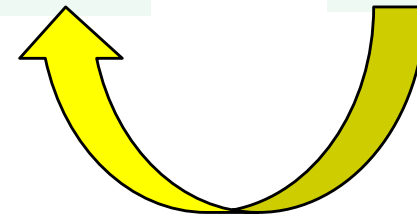
Understand the smallest set of essential mechanisms by reading a **minimalist program**



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

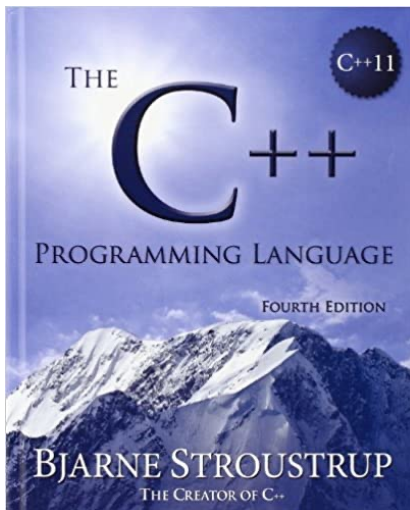


Expand the toolkit by adding



Self-sustained Use-learn cycle

Start the cycle in your final project

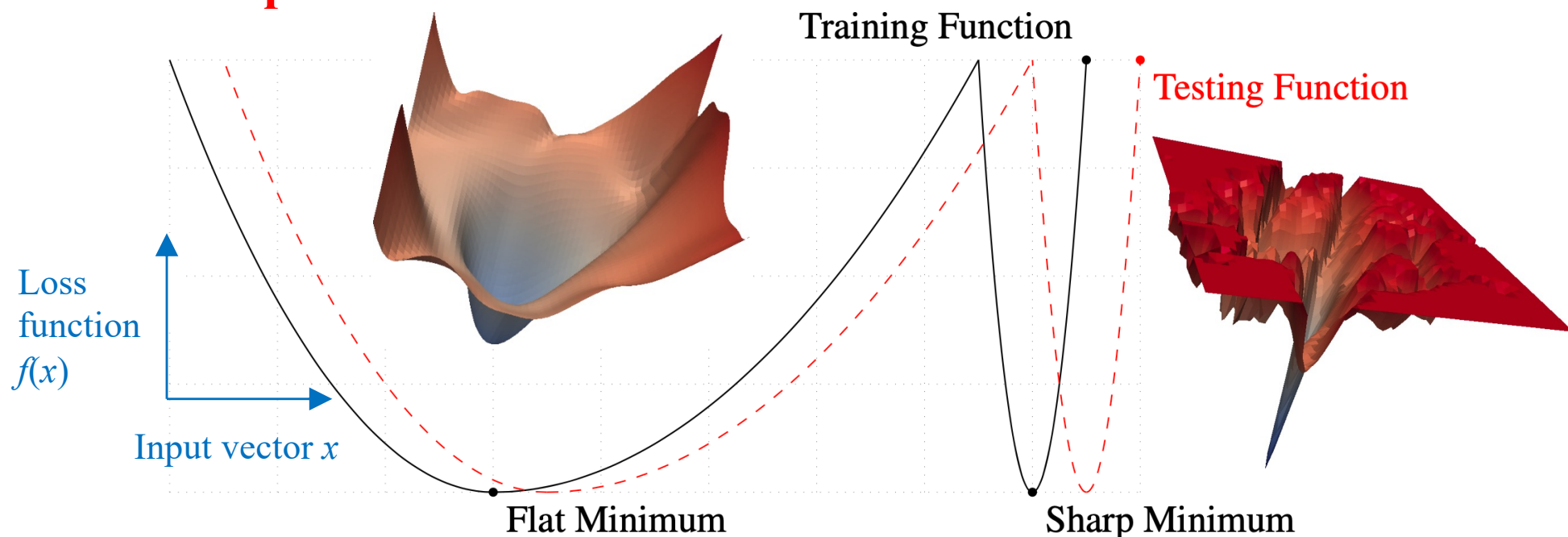


Alternative way

“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>]



Allegro-Legato

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

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