What This Environment Gives You

Languages & Compilers

- Python 3, pip, venv
- C++ (gcc, clang, cmake, ninja, gdb/lldb, ccache)
- Java (OpenJDK 17, Maven, Gradle, VS Code Java extensions)
- Node.js + npm + yarn

Finance & ML

- NumPy, Pandas, Matplotlib, SciPy, scikit-learn, Statsmodels
- PyTorch, TensorFlow (CPU builds)
- TA-Lib, pandas-ta, ccxt, Zipline
- JupyterLab, ipywidgets

Hardware / HDL

- Verilator (fast Verilog simulator)
- GTKWave (waveform viewer)
- Yosys (open-source synthesis)
- Icarus Verilog (iverilog)

DB / Backend

- PostgreSQL client + psycopg2
- SQLite
- Docker CLI (via Codespaces)

Visualization / Docs

- Graphviz
- Mermaid CLI
- Plotly, Seaborn

DevOps / Productivity

- GitHub CLI (gh) via container base
- htop, ncdu, iftop, tmux
- GitLens, Docker, CMake, Java packs (VS Code extensions)

Persistence

- Everything you install at runtime (outside `/workspaces`) will reset, but this **Dockerfile locks all tooling in**.

- Python deps & venvs inside `/workspaces` persist.

This setup is basically a **lab in a box**: C++ builds, Python quant analysis, trading libraries, HDL simulation, waveform visualization, Java development, diagrams, databases, even Jupyter notebooks.