Onboarding

Julia on HLRS Cluster/Laptops

HLRS Laptops

Most of the course can be completed on the laptops.

Equipped with NVIDIA GPU

Jupyter + VS Code

```
jupyter lab
code
```

Course materials

```
$HOME/JuliaHLRS24
```

Let's get started!

→ cd JuliaHLRS24

→ git pull

→ jupyter lab

HLRS Training Cluster

The cluster has two types of nodes.

CPU nodes

"skl"

2 CPUs (skylake)

40 cores total

GPU nodes

"clx-ai"

2 CPUs (cascade lake)

36 cores total

8x NVIDIA V100

Jobs are scheduled with PBS Pro.

Submit a job:

```
qsub job_script.sh
```

Check on your queued/running jobs:

```
qstat -nw
```

VS Code → HLRS Cluster

VS Code → Cluster via SSH

Login node

Works fine, just connect to

`accountname@training.hlrs.de`

Compute node

At HLRS, possible but inconvenient

```
SetEnv PBS_JOBID=…
SSH ProxyJump
```

To get Julia, load the necessary system modules.

Modules on the HLRS training cluster

```
module use julia
module use nvidia/nvhpc     # MPI+CUDA
module use compiler/nvidia # CUDA
```

Outside of the course: If there is no (working) system module, use standard binaries provided by `juliaup`.

Comment: Julia depot is on the parallel file system.

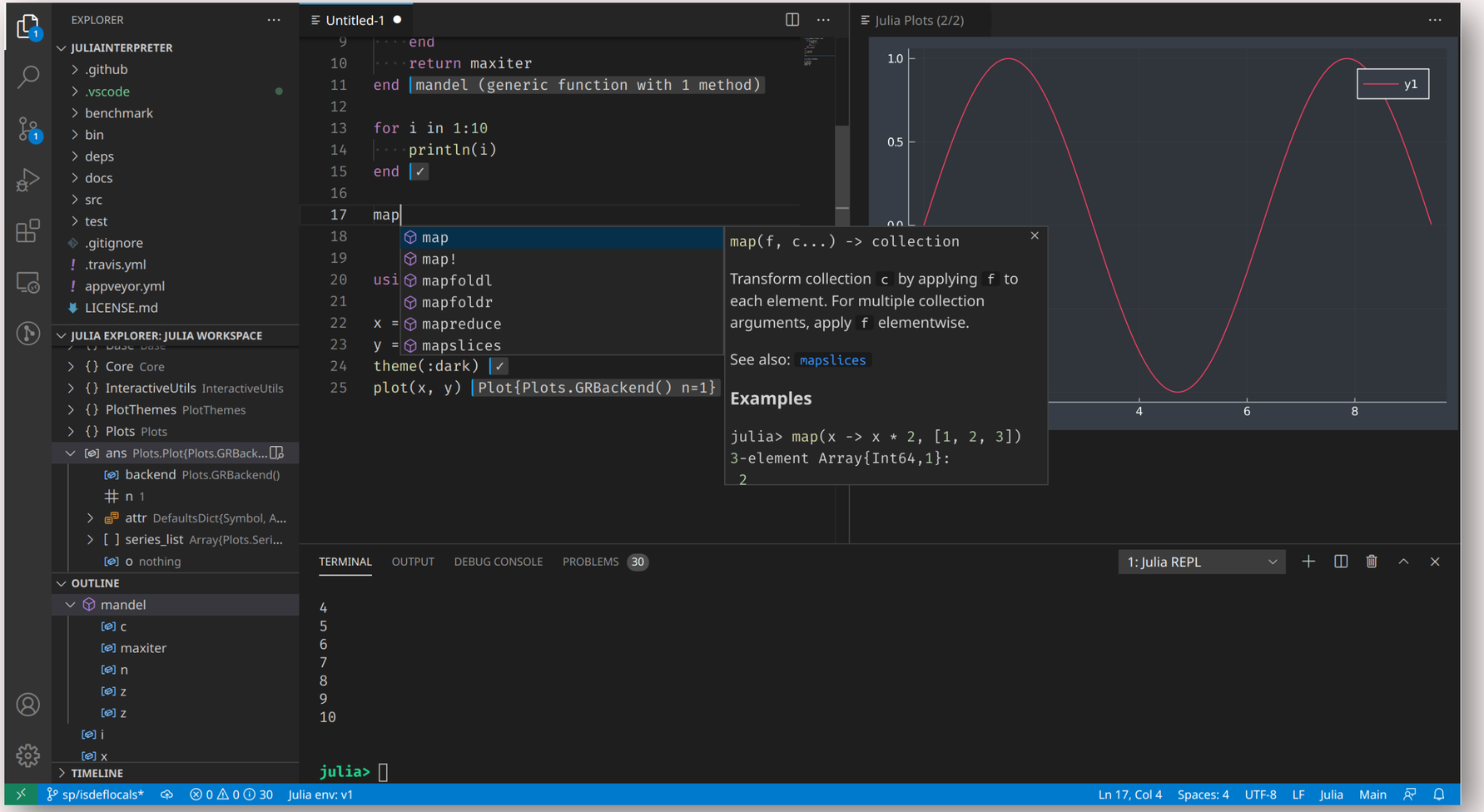
`JULIA_DEPOT_PATH` = where Julia stores stuff

- packages
- binary dependencies
- ...

Why not `$HOME`?

- Quotas
- Can be read-only for compute jobs

Julia VS Code integration via extension.



On the cluster, the extension requires a wrapper.

```
[...]

# Load modules
module load julia
module load nvidia/nvhpc
module load compiler/nvidia

# Pass on all arguments
exec julia "${@}"
```

Let’s do it!

→ exercises/Day1/1_cluster_onboarding