How to use the Julia programming language on the HPC Prince cluster

How to start using Julia on NYU HPC clusters:

- **Step 1:** Login to prince

  From your terminal on your desktop/laptop, run:

  ```
  ssh <your net id>@prince.hpc.nyu.edu
  ```

  output:

  ![](image)

  Last login: Wed Aug 21 12:00:16 on ttys001
  [10-17-42-57:~]~$ ssh 1@prince.hpc.nyu.edu
  [ ~ @prince.hpc.nyu.edu's password: ]
  [ ~ @log-0 ~]$ 

  For more extensive instructions on how to login on the HPC Prince cluster, read the following wiki page.

- **Step 2:** Check for julia modules

  Once you are logged on the Prince cluster, find out what versions of Julia are installed, by get a listed of all Julia software modules that are installed.

  ```
  log-1 ~]$ module spider julia
  ```

  output:
Step 3: Load the version of Julia that you want to use

Select the version of Julia you would like to use. Usually the latest version (in our case 1.1.0) is the one most users pick:

```
log-1 ~]$ module load julia/1.1.0
```

Step 4-1: Run Julia in julia terminal

```
log-1 ~]$ julia
```

output:

```
    _  _  _ _  _  _  _  _  _  _  _  _  _  _  _  _  _  _  _  _  _  _  _
(._)  (._)   (._)   (._) (._)
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```

you can exit julia terminal by running the following code:
• **step 4-2: use julia command to run code**

    ```
    # copy julia sample code to current directory
    log-1 ~]$ cp /share/apps/examples/julia/test.jl .
    # run julia code
    log-1 ~]$ julia ./test.jl
    ```

    ```
    sample_code.jl
    log-1 ~]$ cat /share/apps/examples/julia/test.jl
    n = 10000
    a = SharedArray(Float64, n, n);
    @sync @parallel for j in 1:size(a,2)
        for i in 1:size(a,1)
            a[i,j] = min(i,j)
        end
    end
    b = SharedArray(Float64, n);
    @sync @parallel for i in 1:n;
        b[i] = sum(a[i, :])
    end
    for i in 1:2000:n;
        @printf "%d %f\n" i b[i]
    end
    ```

• **step 4-3 using julia with slurm**

    ```
    copying batch files from shared folders
    log-1 ~]$ cp /share/apps/examples/julia/ ./
    ```
```
log-1 ~]$ cat julia.sbatch

#!/bin/sh
#SBATCH --time=00:15:00
#SBATCH --nodes=4
#SBATCH --ntasks-per-node=1
# the resources requested above must be within the allocation
# we need to load the julia module so that the paths are set up right.
module load julia

# this starts the julia script which will srun its own processes
julia test.jl
```

```
log-1 ~]$ sbatch julia.sbatch
```