

# **Joint ICTP-IAEA School on Data for Modelling Atomic and Molecular Processes in Plasmas**

## **Technical Briefing and Introduction to Linux**

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**JupyterHub:** <https://jupyter.ictp.it/smr3924/>

**Login with the  
credentials that have  
been emailed to you**

# JupyterHub: <https://jupyter.ictp.it/smr3924/>

File Browser; Launcher; New Directory; Upload Files

The screenshot displays the JupyterHub interface. On the left is the File Browser, which includes a menu bar (File, Edit, View, Run, Kernel, Tabs, Settings, Help), a search bar for filtering files by name, and a table listing files. A red circle highlights the '+' icon in the top-left corner of the File Browser, which is used for creating new directories or files. The main area is the Launcher, which is divided into three sections: 'Notebook', 'Console', and 'Other'. Each section contains icons for different environments: Python 3 (ipykernel), Anaconda3 full, gnuplot, and R. The 'Other' section includes icons for Terminal, Text File, Markdown File, Python File, R File, and Show Contextual Help. On the right side, there is a panel with the text 'No properties to inspect.' and a 'Launcher' label at the bottom right.

| Name          | Last Modified |
|---------------|---------------|
| SDTrimSP_6.05 | 8 months ago  |

Launcher

No properties to inspect.

Launcher

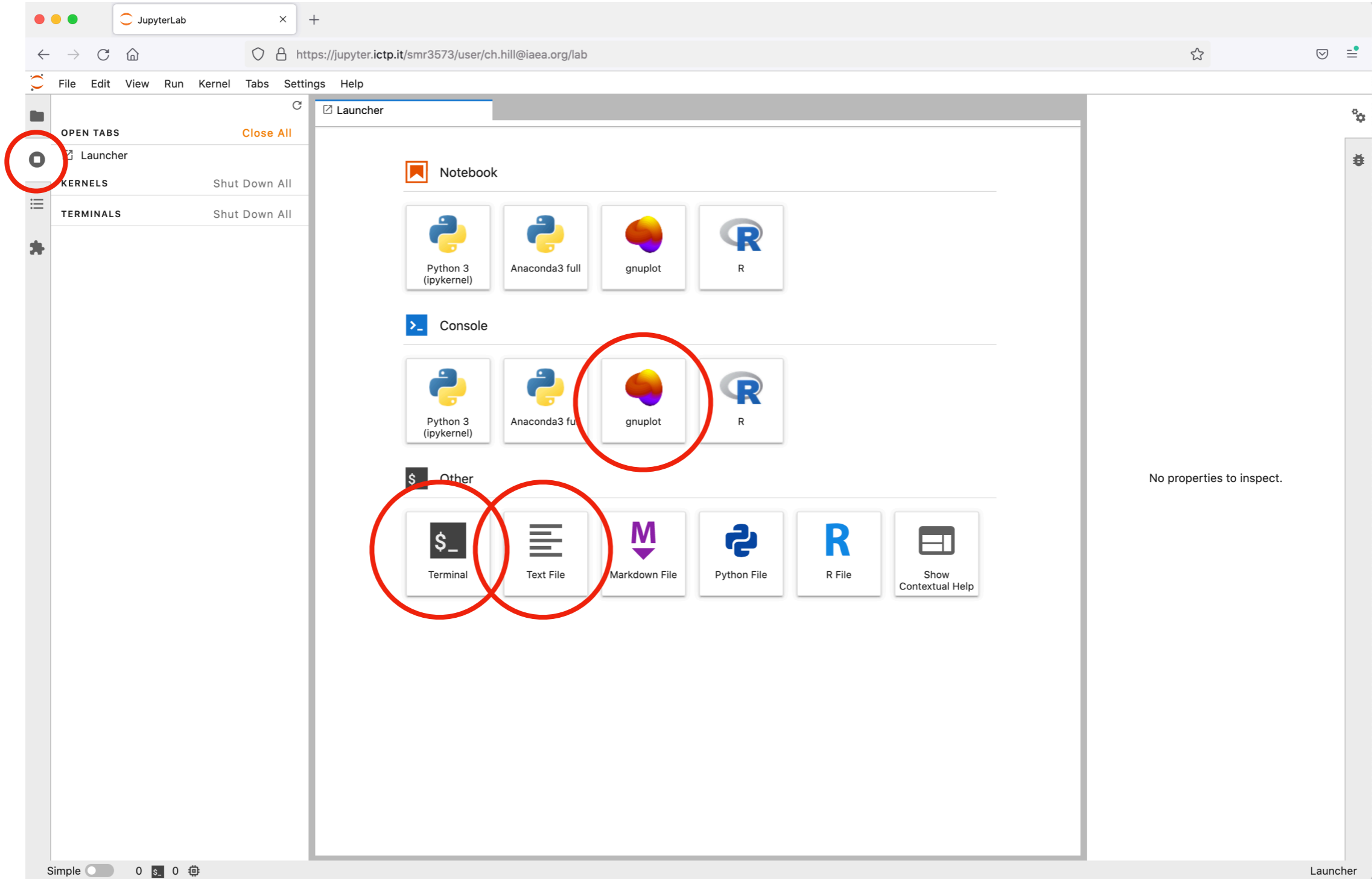
# JupyterHub: <https://jupyter.ictp.it/smr3924/>

## Launcher; Running Terminals and Kernels

The screenshot displays the JupyterLab Launcher interface within a web browser. The browser's address bar shows the URL `https://jupyter.ictp.it/smr3573/user/ch.hill@iaea.org/lab`. The interface includes a top menu bar with options: File, Edit, View, Run, Kernel, Tabs, Settings, and Help. On the left side, there is a sidebar with three main sections: 'OPEN TABS' (containing a 'Launcher' tab), 'KERNELS' (with a 'Shut Down All' button), and 'TERMINALS' (with a 'Shut Down All' button). A red circle highlights the 'Launcher' icon in the sidebar. The main content area is titled 'Launcher' and is organized into three categories: 'Notebook', 'Console', and 'Other'. Each category contains several icons representing different environments or file types. The 'Notebook' and 'Console' sections each feature icons for Python 3 (ipykernel), Anaconda3 full, gnuplot, and R. The 'Other' section includes icons for Terminal, Text File, Markdown File, Python File, R File, and Show Contextual Help. On the right side of the interface, there is a vertical toolbar with a gear icon and a 'No properties to inspect.' message. At the bottom left, there is a 'Simple' toggle switch and a status bar showing '0 \$ 0'. The bottom right corner of the interface is labeled 'Launcher'.

# JupyterHub: <https://jupyter.ictp.it/smr3924/>

## Launcher; Running Terminals and Kernels



# JupyterHub: <https://jupyter.ictp.it/smr3924/>

Download: Right-click (or CTRL-click) on filename

The screenshot displays the JupyterLab interface. The browser address bar at the top shows the URL: <https://jupyter.ictp.it/smr3573/user/ch.hill@iaea.org/lab/tree/LAM>. The main interface is divided into several panels. On the left is the file browser, which shows a search bar and a list of files in the directory `/ LAMMPS /`. The file `instructions.pdf` is selected, and a context menu is open over it. The menu items are: `Open`, `Open With`, `+ Open in New Browser Tab`, `Rename` (F2), `Delete` (Delete), `Cut` (⌘ X), `Copy` (⌘ C), `Duplicate` (⌘ D), `Download` (highlighted), `Shut Down Kernel`, `Copy Download Link`, `Copy Path`, `Copy Shareable Link`, `New Folder`, `New File`, `New Markdown File`, and `Paste` (⌘ V). At the bottom of the menu, it says "Shift+Right Click for Browser Menu". In the center, the "Launcher" panel shows a Python 3 (ipykernel) icon. On the right, the main workspace area displays the text "No properties to inspect." The bottom status bar shows "Simple" mode, a kernel indicator with "1" and "0", and the "Launcher" label.

# JupyterHub: <https://jupyter.ictp.it/smr3924/>

Upload: Click upload icon

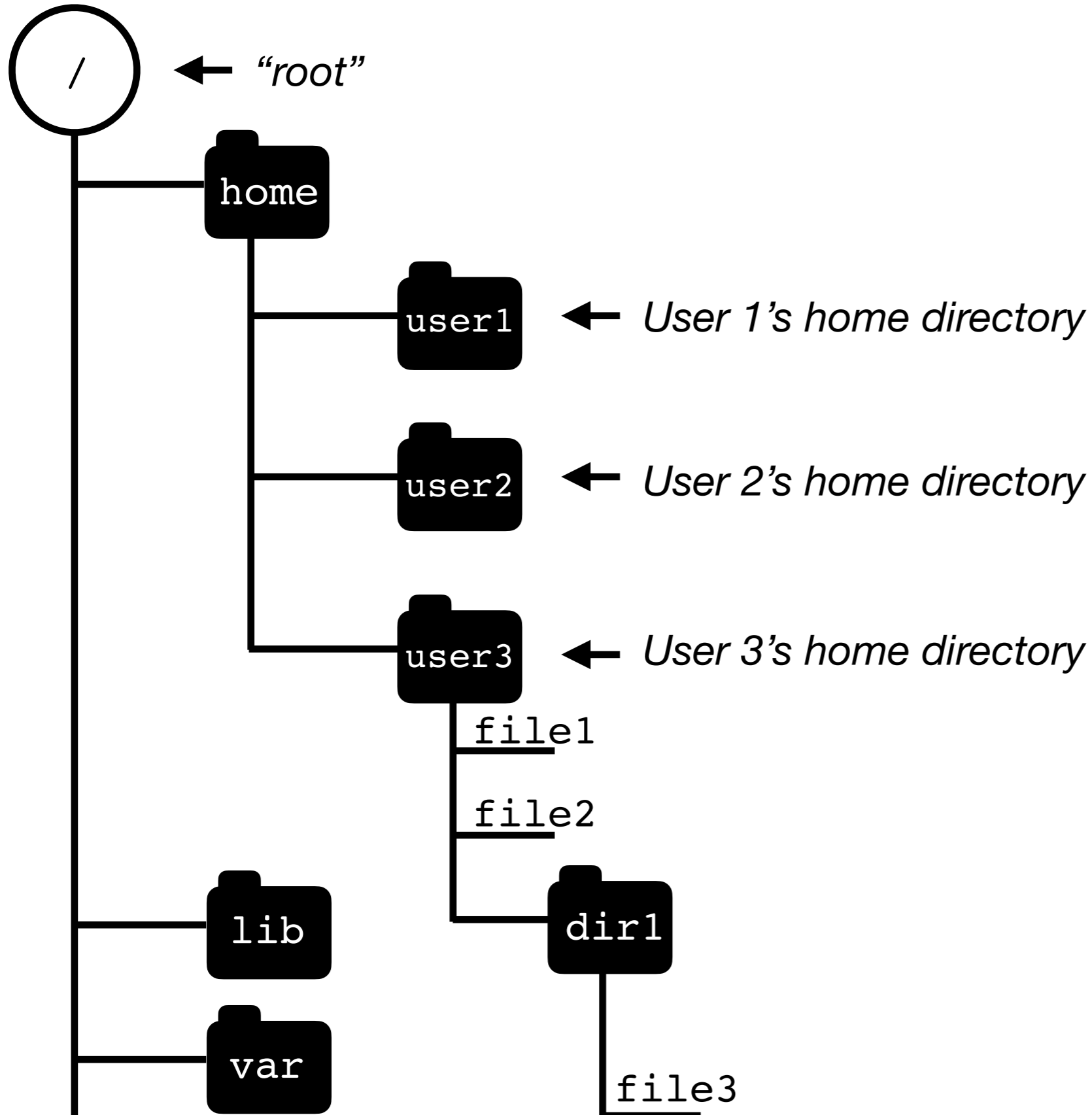
The screenshot displays the JupyterHub interface. At the top, a menu bar includes 'File', 'Edit', 'View', 'Kernel', 'Tabs', 'Settings', and 'Help'. Below the menu, a toolbar contains a plus sign, a refresh icon, and an upload icon (a square with an upward arrow) which is circled in red. A search bar labeled 'Filter files by name' is positioned below the toolbar. The file browser on the left shows a directory structure with a folder named 'SDTrimSP\_6.05' listed under the 'Name' column, with its 'Last Modified' date as '8 months ago'. The main area is the 'Launcher' tab, which is divided into three sections: 'Notebook', 'Console', and 'Other'. The 'Notebook' section contains four icons for 'Python 3 (ipykernel)', 'Anaconda3 full', 'gnuplot', and 'R'. The 'Console' section also contains four identical icons for the same environments. The 'Other' section includes icons for 'Terminal', 'Text File', 'Markdown File', 'Python File', 'R File', and 'Show Contextual Help'. On the right side of the interface, there is a panel with the text 'No properties to inspect.' and a gear icon for settings. At the bottom left, there is a status bar showing 'Simple' mode, a toggle switch, and the number '1'. At the bottom right, the word 'Launcher' is displayed.

# Basic Linux Terminal Commands

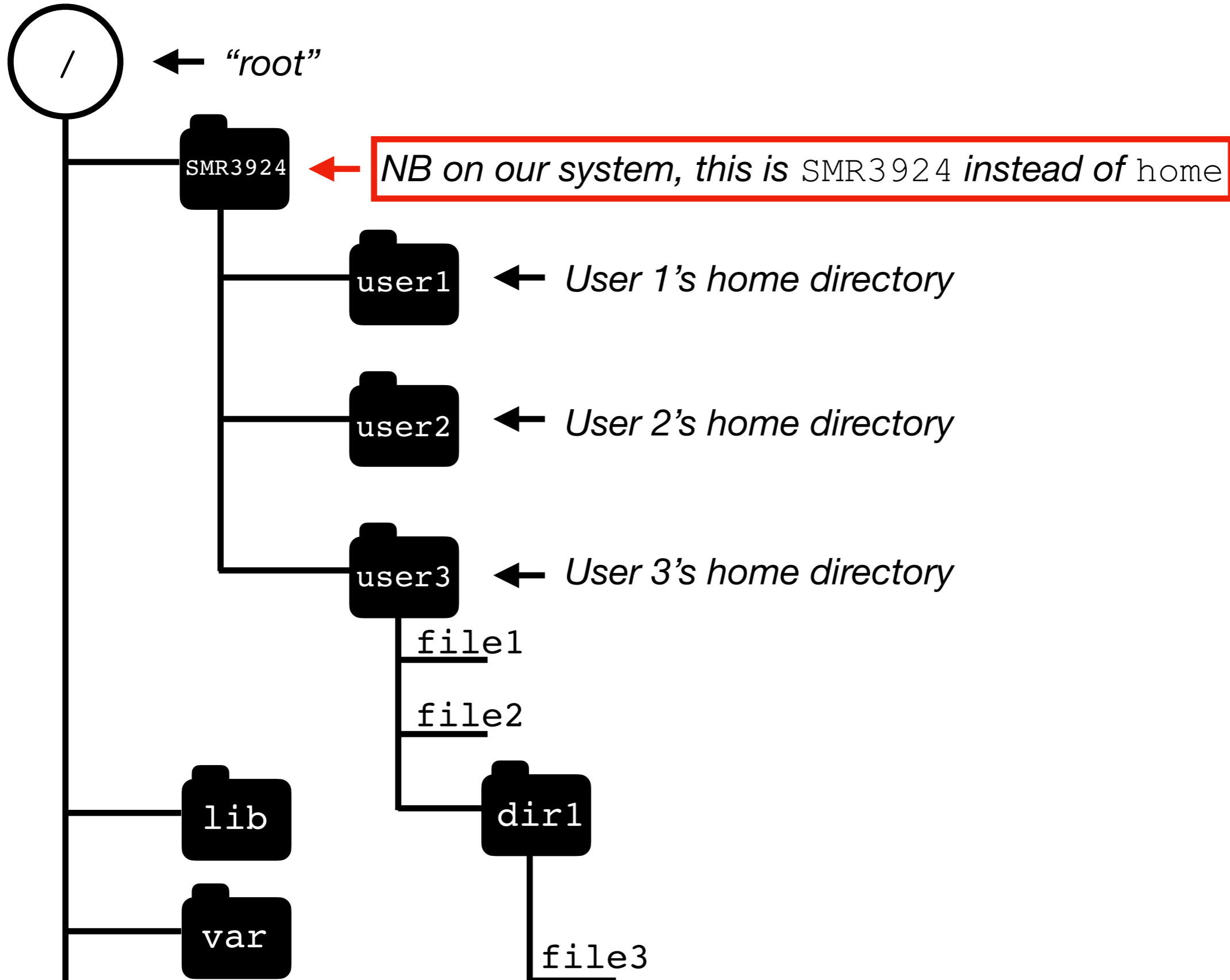
|   |   |
|---|---|
| <code>ls [dirname]</code>                                 | List contents of a directory                |
| <code>cd &lt;dirname&gt;</code>                           | Change directory                            |
| <code>pwd</code>  | Where (in which directory) am I?            |
| <code>mkdir &lt;dirname&gt;</code>                        | Create a directory                          |
| <code>cat &lt;filename&gt;</code>                         | Show the contents of <filename>             |
| <code>head &lt;filename&gt;</code>                        | First 10 lines of <filename>                |
| <code>tail &lt;filename&gt;</code>                        | Last 10 lines of <filename>                 |
| <code>rm &lt;filename&gt;</code>                          | Delete file <filename>                      |
| <code>rmdir &lt;dirname&gt;</code>                        | Delete directory <dirname>                  |
| <code>cp &lt;old_filename&gt; &lt;new_filename&gt;</code> | Copy a file                                 |
| <code>mv &lt;old_filename&gt; &lt;new_filename&gt;</code> | Move (rename) a file                        |
| <code>touch &lt;filename&gt;</code>                       | Update accessed/modified time of <filename> |



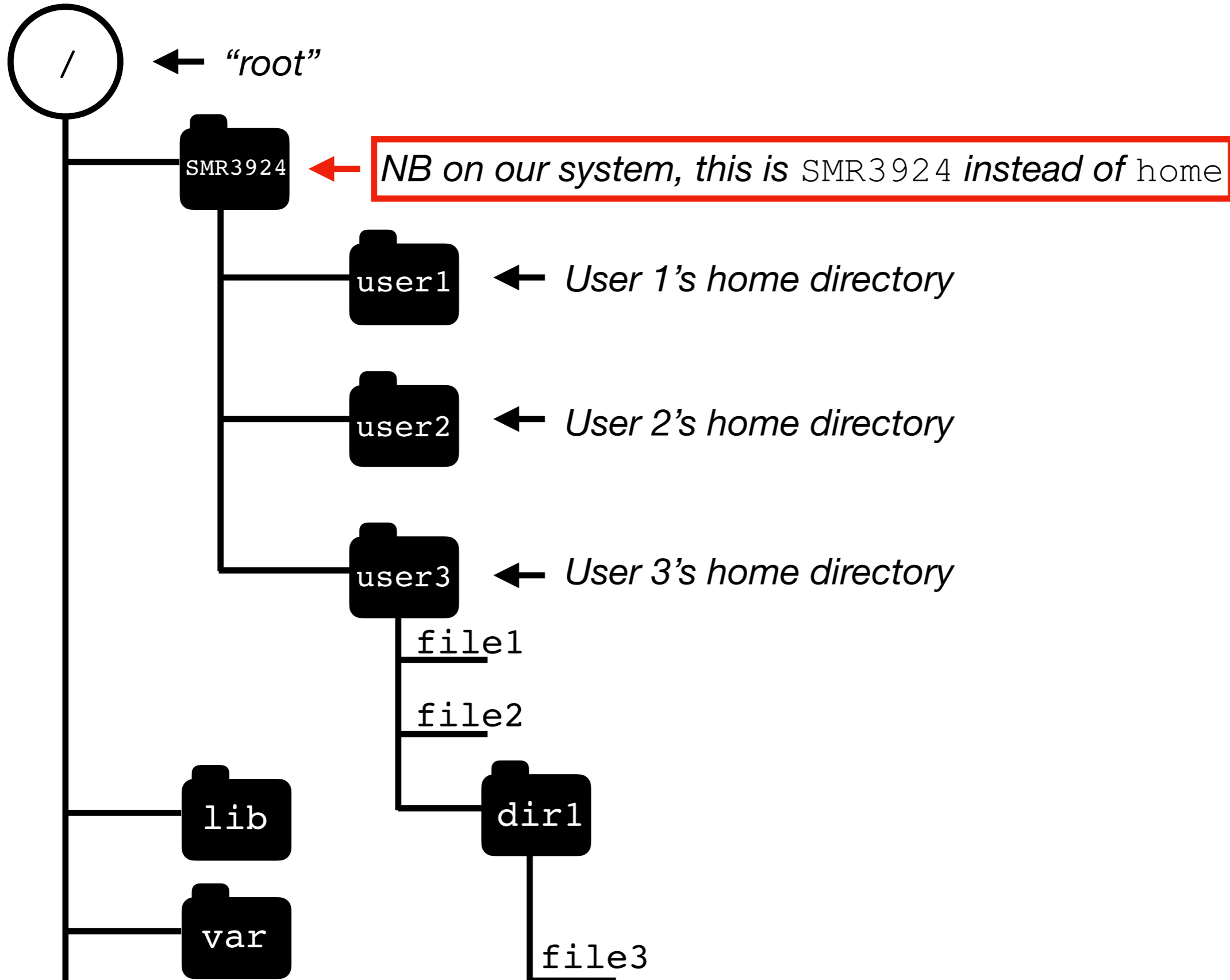
# Navigating the File System



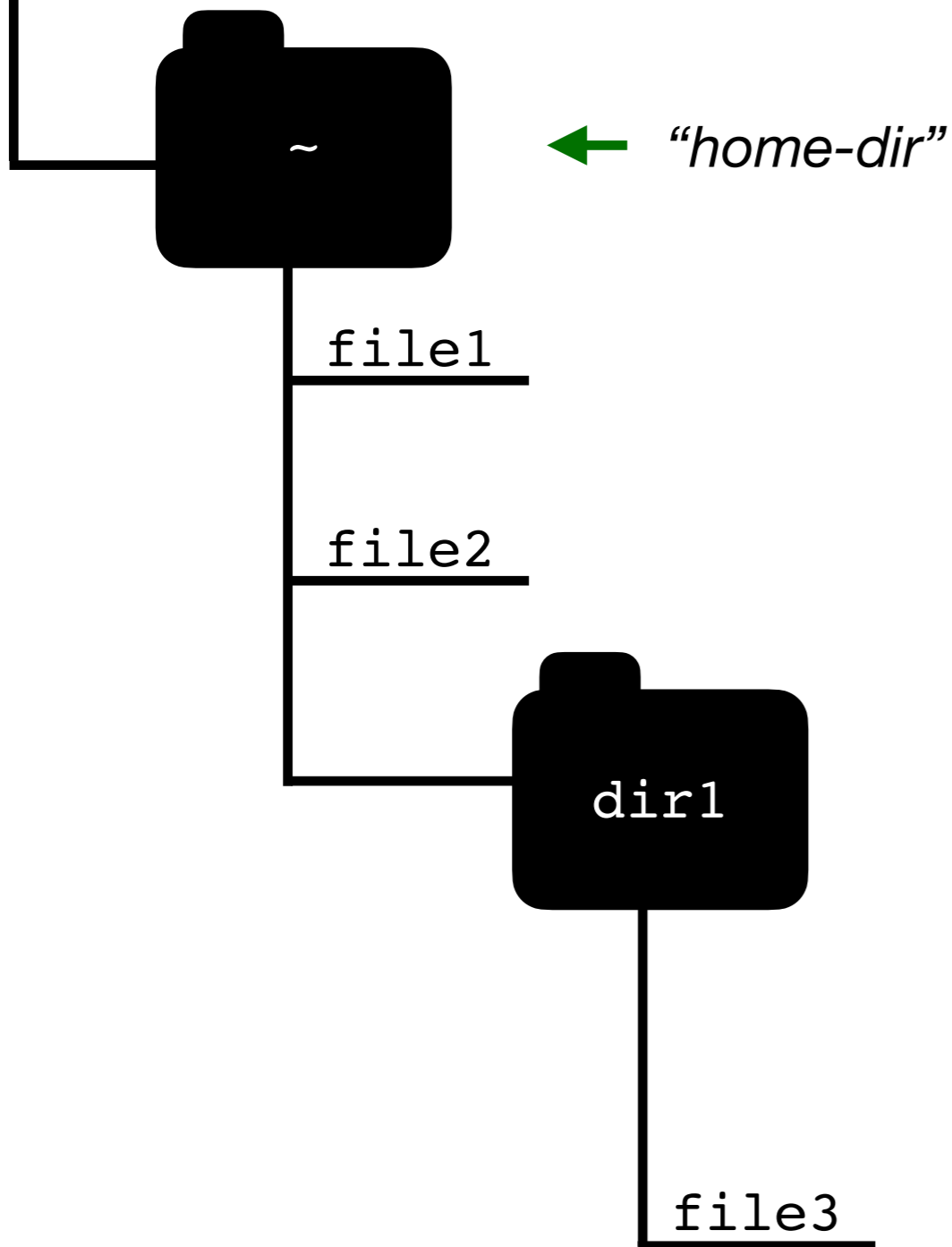
# Navigating the File System



# Navigating the File System

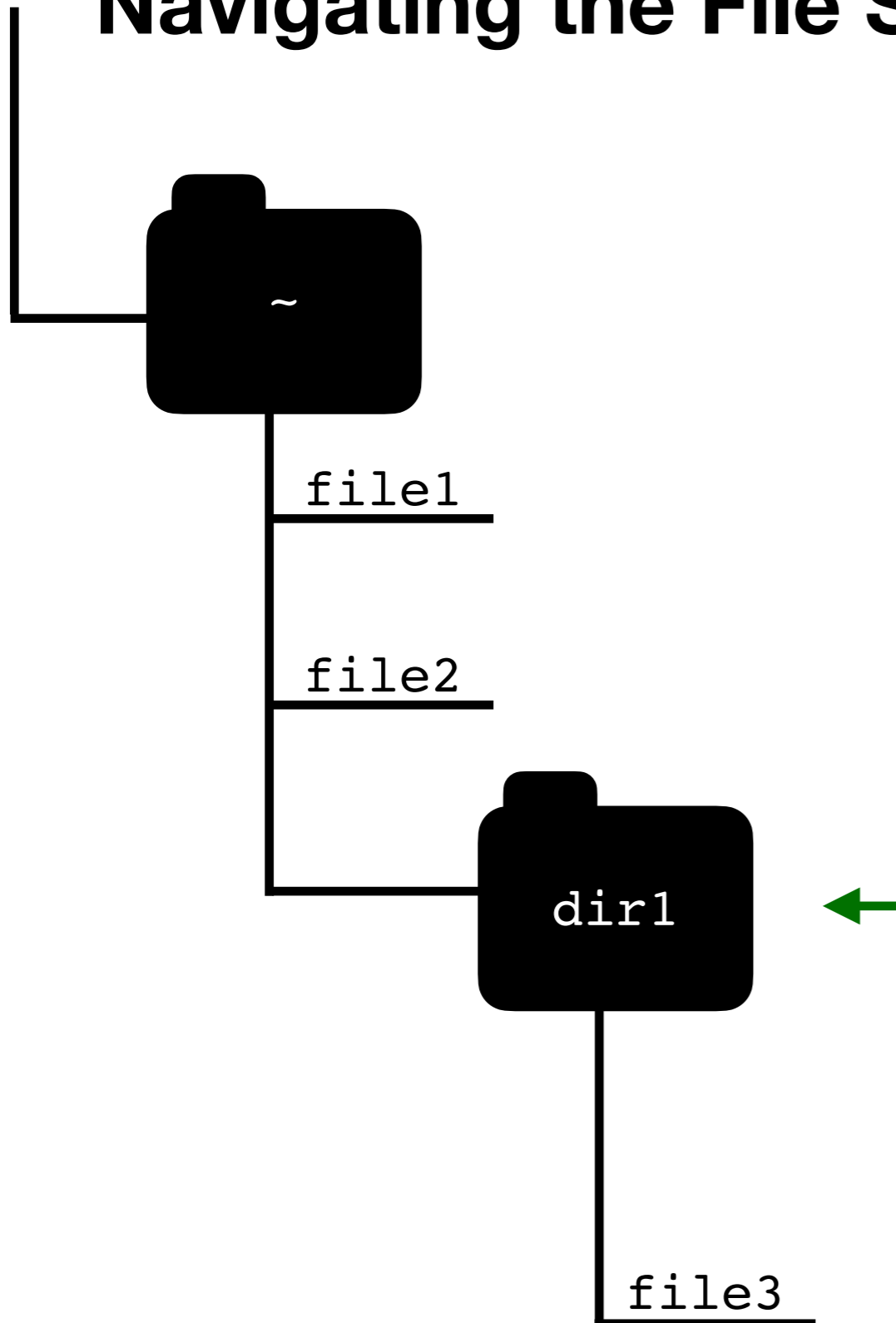


# Navigating the File System



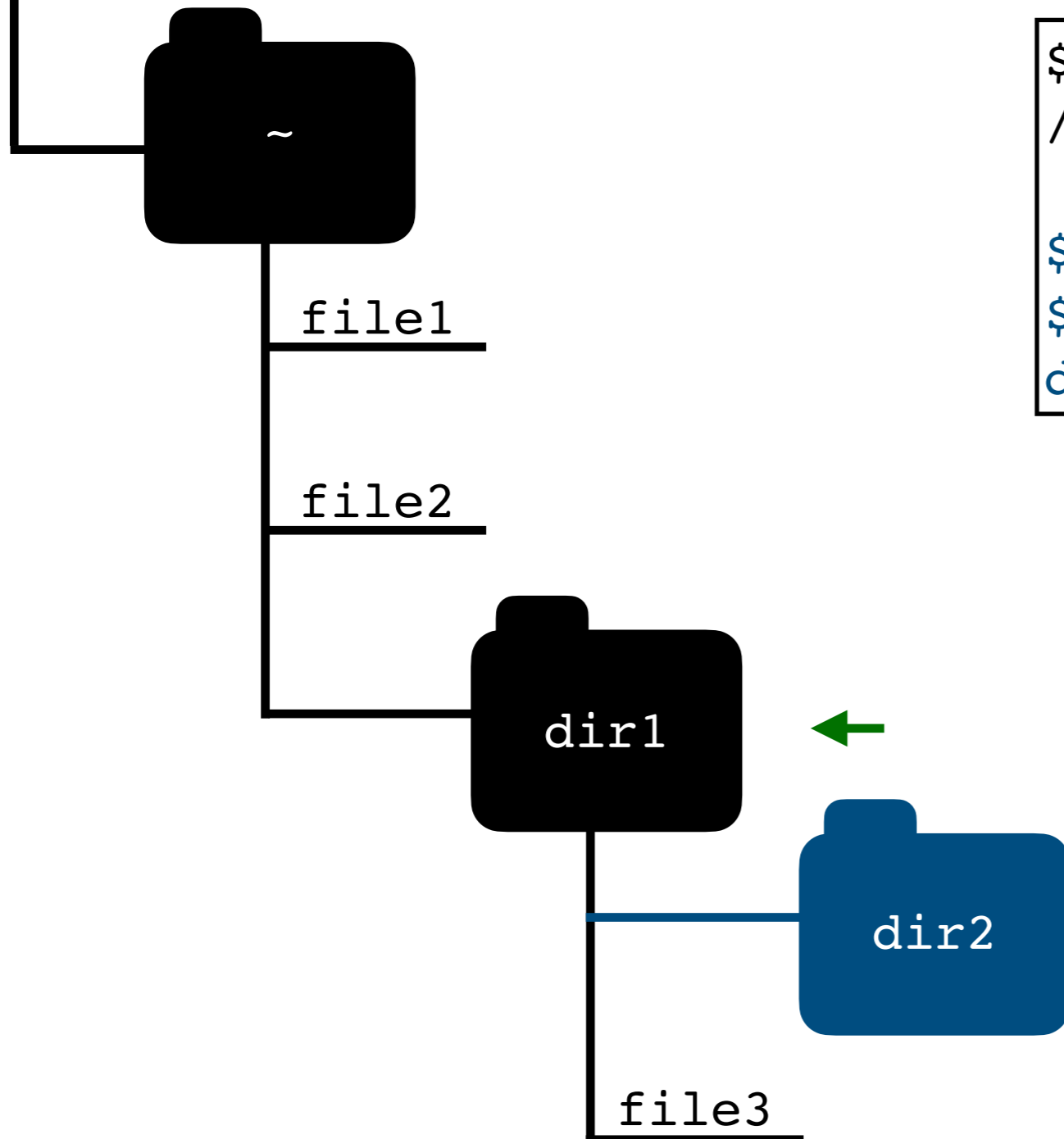
```
$ cd ~ ←  
$ ls  
dir1  file1  file2
```

# Navigating the File System



```
$ cd ~  
$ ls  
dir1  file1  file2  
  
$ cd dir1 ←  
$ ls  
file3  
  
$ pwd  
/SMR3924/ch.hill@iaea.org/dir1
```

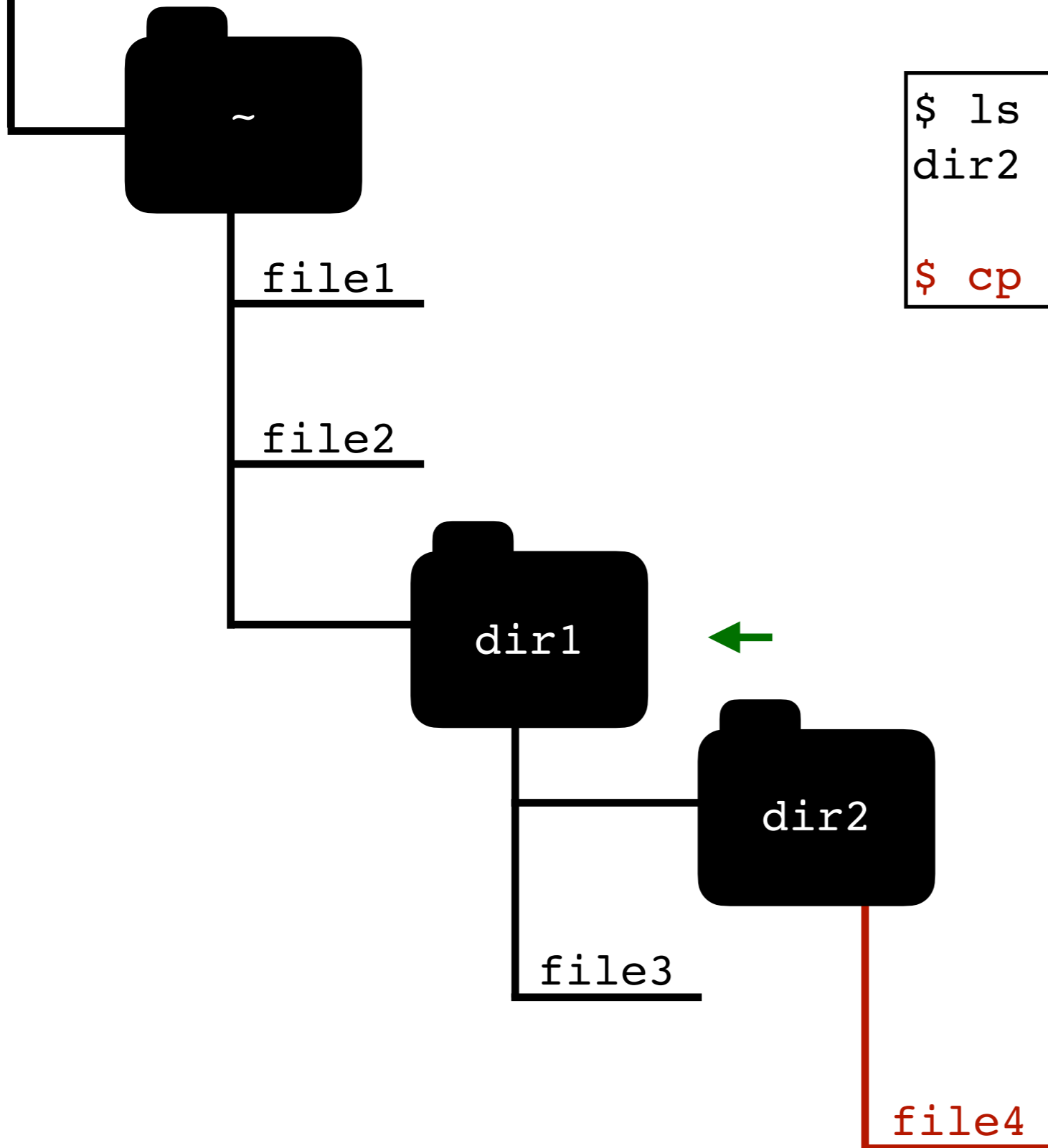
# Navigating the File System



```
$ pwd
/SMR3924/ch.hill@iaea.org/dir1

$ mkdir dir2
$ ls
dir2  file3
```

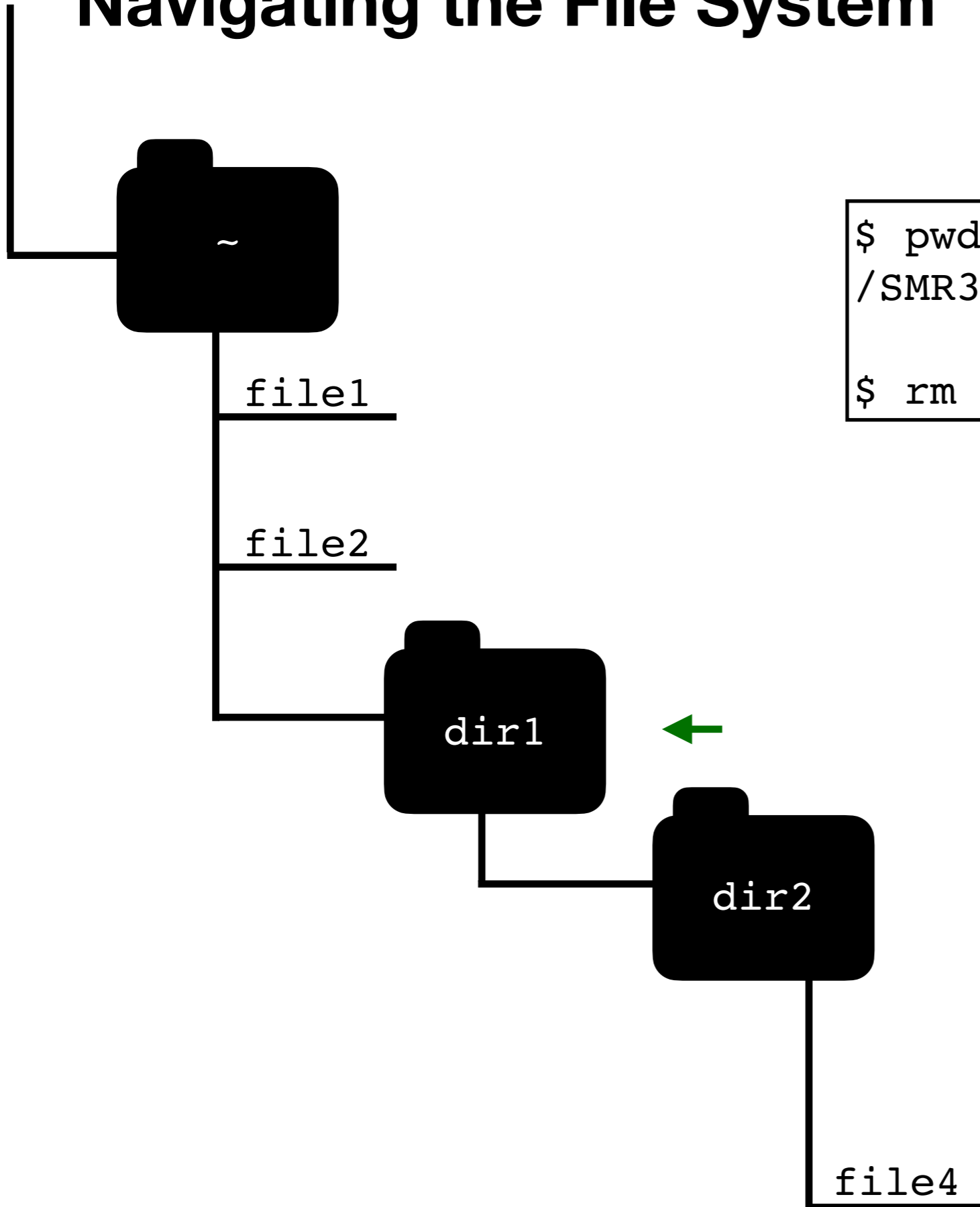
# Navigating the File System



```
$ ls  
dir2 file3
```

```
$ cp file3 dir2/file4
```

# Navigating the File System

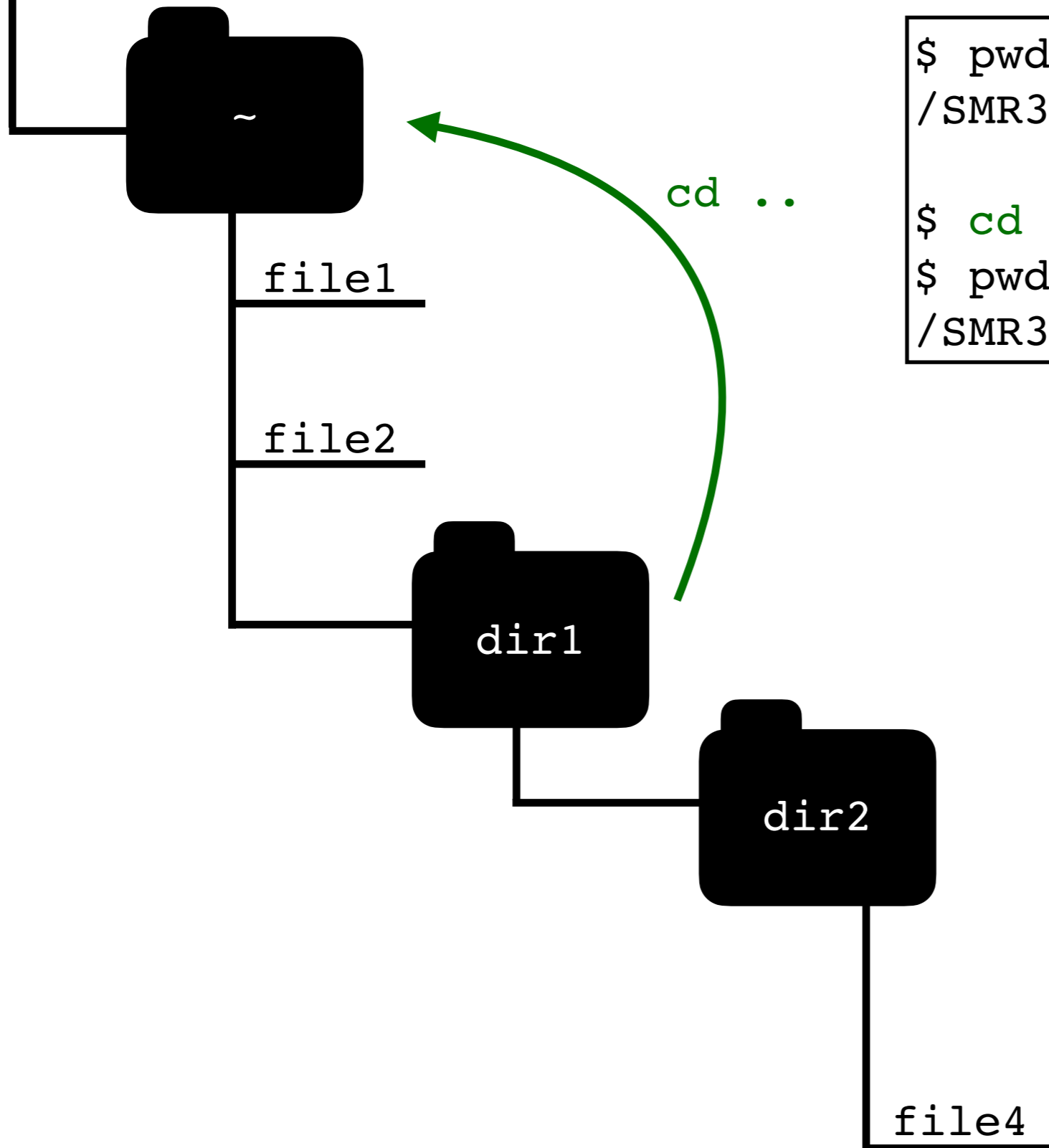


```
$ pwd
/SMR3924/ch.hill@iaea.org/dir1

$ rm file3
```



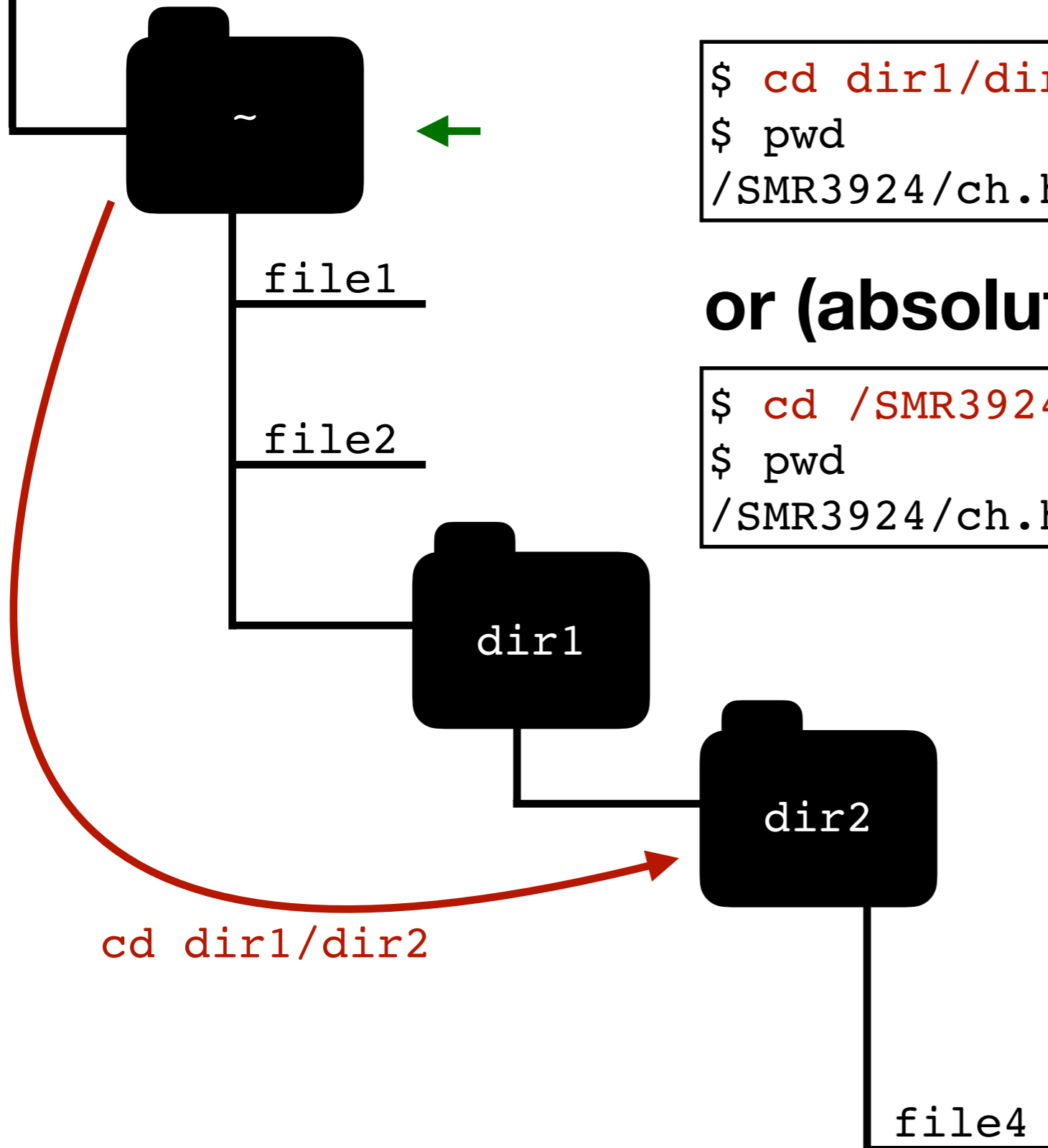
# Navigating the File System



```
$ pwd
/SMR3924/ch.hill@iaea.org/dir1

$ cd .. ←
$ pwd
/SMR3924/ch.hill@iaea.org/
```

# Navigating the File System



```
$ cd dir1/dir2  
$ pwd  
/SMR3924/ch.hill@iaea.org/dir1/dir2
```

**or (absolute path)**

```
$ cd /SMR3924/ch.hill@iaea.org/dir1/dir2  
$ pwd  
/SMR3924/ch.hill@iaea.org/dir1/dir2
```

# Command options: `ls`

|                 |   |
|-----------------|---|
| <code>-a</code> | Even list “hidden” files starting with <code>.</code> |
| <code>-d</code> | List directory entries, not contents                  |
| <code>-h</code> | Human-readable file sizes                             |
| <code>-r</code> | Reverse order when sorting                            |
| <code>-t</code> | Sort by modification time                             |
| <code>-R</code> | List subdirectories recursively                       |

“man[ual]” page: <https://linux.die.net/man/1/ls>

# The cd command

|                        |  |
|------------------------|--|
| <code>cd ..</code>     | Navigate “up” to parent directory                |
| <code>cd</code>        | Navigate to home directory                       |
| <code>cd -</code>      | Navigate to previous directory                   |
| <code>cd ~/dir1</code> | Navigate to <code>dir1/</code> in home directory |

# The `mkdir` command

```
mkdir -p dir1/dir2/dir3
```

Make parent directories `dir1/dir2/` as needed

# The `cat` command

```
-n
```

Number lines

```
-E, --show-ends
```

Print \$ and line endings

```
-T, --show-tabs
```

Display tab characters as `^I`

```
-v, --show-nonprinting
```

Display non-printing characters using `^` and `M-^` notation

# Exercises

1. Find the absolute path of your home directory
2. Copy the file `/SMR3924/PUBLIC/lorem-ipsum.txt to your home directory.`
3. When was this file last modified? How large is it (exactly in bytes, and approximately, in kB)?
4. Remove the file `lorem-ipsum.txt from your home directory.`
5. Create a directory within your home directory called `molspec` and two more within that one called `CO-fit` and `kB-fit`.
6. Copy the files `NH3-line.csv` and `fit-kB.ipynb` from `/SMR3924/PUBLIC/` to the directory `molspec/kB-fit/` you created.