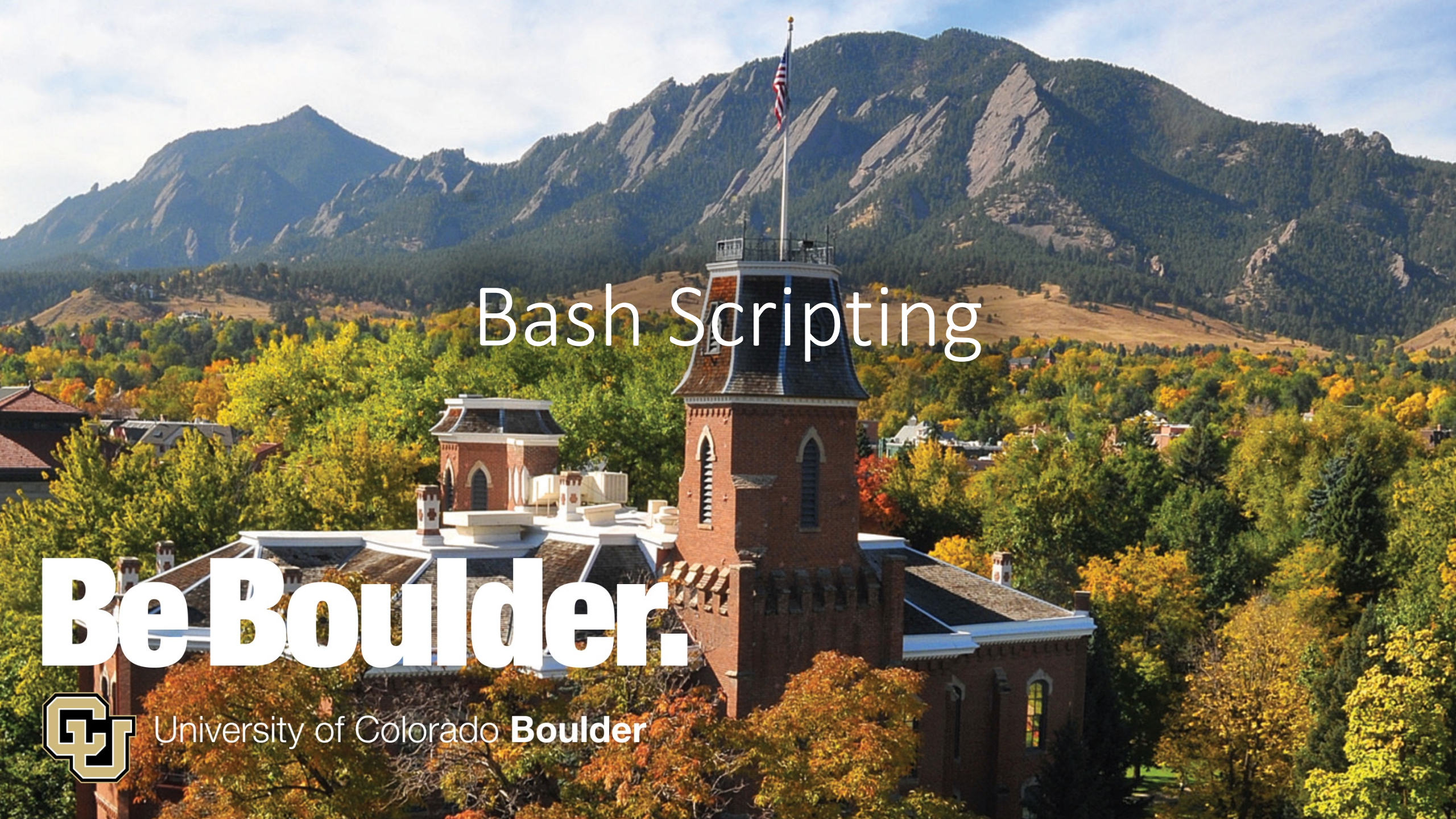

Bash Scripting
Be Boulder.
University of Colorado Boulder

What is a shell?

- A shell is the environment in which commands are interpreted in Linux
- GNU/Linux provides various shells; bash most popular
  - sh
  - csh
  - tcsh
  - ksh
- Shell scripts are files containing collections of commands for Linux systems that can be executed as programs

https://github.com/ResearchComputing/HPC_short_course_summer_2018/blob/master/Bash_HPC_summer_18.pdf
Courtesy of Andrew Monaghan, CU Boulder Research Computing

Bash Script

- To create a bash shell script file, the first line must contain
  - #!/bin/bash
- Program loader recognizes the #!, and the /bin/bash part tells the interpreter which shell should be run
- Example:

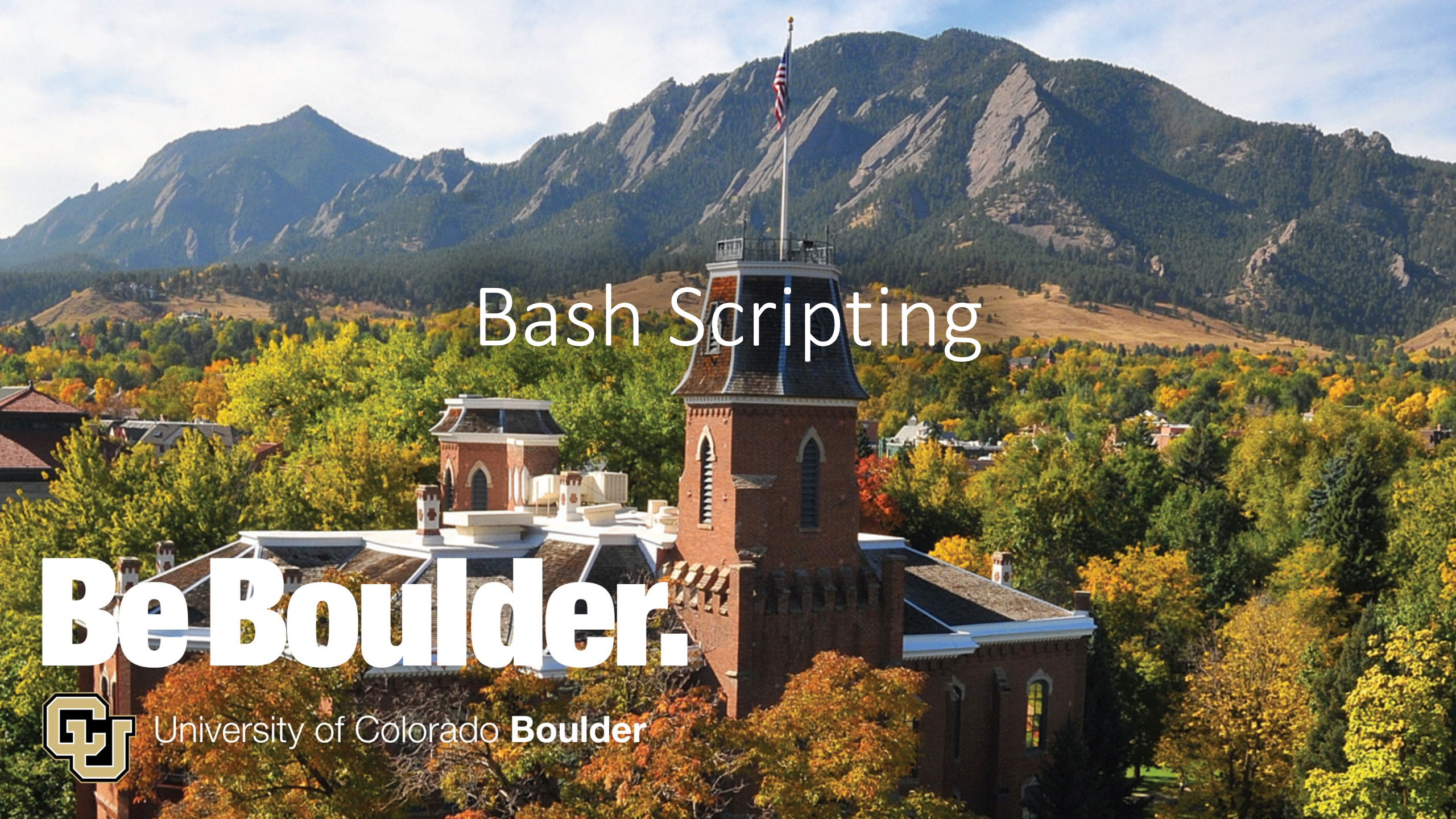
```
#!/bin/bash

cd /home/mooc
hostname

echo ”Hello!” > file.out
echo “Hello again!” >> file.out
```

https://github.com/ResearchComputing/HPC_short_course_summer_2018/blob/master/Bash_HPC_summer_18.pdf
Courtesy of Andrew Monaghan, CU Boulder Research Computing

Variables

- Shell variables are local
- Environment variables are global
  - Contain data that are used by one or more applications
- Several pre-defined environment variables in your container
  - Type “env” in the terminal window
- Examples
  - NAME=(CU Boulder)
    - echo ${NAME[0]}
  - $USER
    - echo $USER
  - VAR=$(pwd)
    - echo $VAR

https://github.com/ResearchComputing/HPC_short_course_summer_2018/blob/master/Bash_HPC_summer_18.pdf
Courtesy of Andrew Monaghan, CU Boulder Research Computing


Bash Scripting
Be Boulder.
University of Colorado Boulder

Loops

- Two types: while and for

```
x=0
while [ $x -lt 10 ]; do
    echo $x
    x=$(($x+1))
done
```

https://github.com/ResearchComputing/HPC_short_course_summer_2018/blob/master/Bash_HPC_summer_18.pdf
Courtesy of Andrew Monaghan, CU Boulder Research Computing

Loops

- Two types: while and for

```
list=(a b c)
for v in ${list[@]}; do
    echo $v
done
```

https://github.com/ResearchComputing/HPC_short_course_summer_2018/blob/master/Bash_HPC_summer_18.pdf
Courtesy of Andrew Monaghan, CU Boulder Research Computing

Permissions

- Before you can run a script you need to make sure the script has the appropriate permissions
- At the command line, type, "`ls -l`"
- Column 1: Permissions
  - d, r, w, x
  - Owner, group, global
- Chmod changes permissions
  - `chmod +x filename.sh`
  - Makes the file executable for everyone
- Run it, using `./filename.sh`
- Could also have done bash filename.sh and avoided permissions