**Organize your work**

1. Choose a text editor
2. Choose a command-line interpreter
3. Create a folder
4. Git a Unix basic command cheat sheet
5. Install necessary software

**Make tool**

What is make?

automation tool used for

* Running and compiling programs
* Aliasing commands that span over multiline

Why make is important?

Do I need to install make on my machine?

How does make work?

Make vs makefile

Makefile --> rules 🡪 target: dependencies

Actions

Whitespace sensitive

Demo:

1. Create Avg.py that includes the following code.

def avg(marks):

assert len(marks) != 0

return sum(marks)/len(marks)

print("The average of 1, 2 and 3 is: ", avg([1, 2, 3]))

1. Run some commands on Avg.py from the command line.

# display output to monitor

$ python Avg.py

# display output to a file, Output.txt

$ python Avg.py > Output.txt

# display contents of Output.txt on monitor

$ cat Output.txt

The average of 1, 2 and 3 is: 2.0

1. Use make and makefile to accomplish the same thing

3.1 create a makefile that has the following contents

Output.txt:

python Avg.py

cat Avg.py

python Avg.py > Output.txt

3.2 Run “make Output.txt”. You may receive a message “make: `Output.txt' is up to date.” Because the target, Output.txt, exists in the current folder. Delete the target “Output.txt” and re-execute the command “make Output.txt”.

Note: if you want to suppress a command in a makefile from being printed out when a make commands is executed, precede it with “@”.

3.3 Add a complete make rule to the make file. Recall a complete make rule is as follows.

target: dependencies

Actions

Semantics: Execute actions to generate target

Update the previous make file as follows.

Output.txt: Avg.py

python Avg.py

cat Avg.py

python Avg.py > Output.txt

The command “make Output.txt” will execute the actions if

* “Output.txt” does not exist in the current folder or
* When one of the dependencies, “Avg.py”, is updated.

If there is a file that does not have dependencies but you need to execute the actions even the target is present, you can use .PHONY as follows.

.PHONY: Output.txt

Output.txt:

python Avg.py

cat Avg.py

python Avg.py > Output.txt