Python Programming
Packages 1

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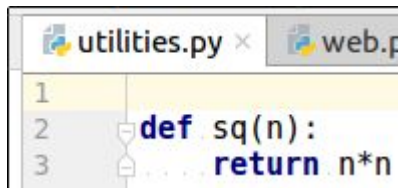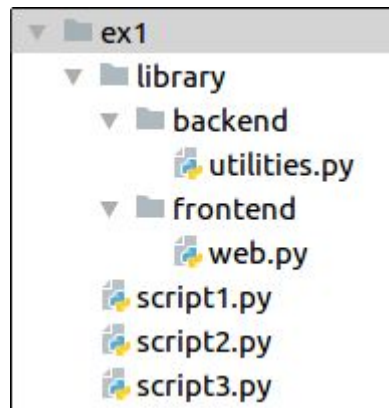*PhD* from Simon Fraser University - Canada
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Packages

- A group of modules structured in the hard disk
- Practically:
  - Big projects might be split to different packages
  - We download, install and import modules from 3rd party packages
- The example on right:
  - A package named library
    - 2 sub-packages: backend and frontend
      - Each package has some files
  - The scripts want to use the package
    - We can import modules from package to use
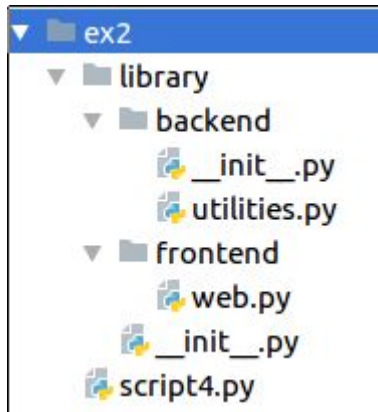
Importing from a package

```python
# script1.py
1  from library.backend import utilities
2
3  print(utilities.sq(10))
4
```

```python
# script2.py
1  from library.backend.utilities import sq
2
3
4  print(sq(10))
```

```python
# script3.py
1  # you should import module or something in a module
2  import library
3
4  # AttributeError: module 'library' has no attribute 'backend'
5  print(library.backend.utilities.sq(10))
```
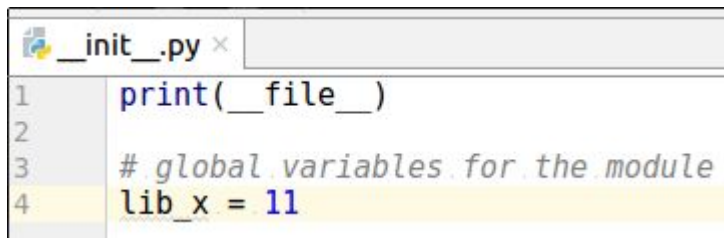
Package Initialization

- If you created **__init__**.py file, it will be called if
  - package or one of its modules is imported
- It can be used to
  - perform some intializations on the package level
  - assign global variables to be used by the modules
- This is an **optional** file:
  - **History**: Before python 3.3, this file was a must
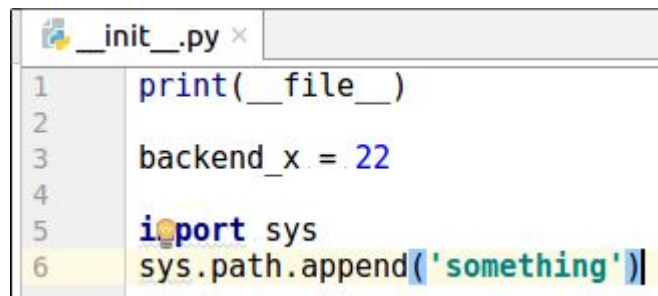   - It marks a directory as a package

Init content

- It can be empty file, global things or whatever initialization
- On left the library init, on right backend init

```
__init__.py ×
1  print(__file__)
2
3  # global variables for the module
4  lib_x = 11
```

```
__init__.py ×
1  print(__file__)
2
3  backend_x = 22
4
5  iport sys
6  sys.path.append('something')
```

Importing a package with init

```python
# Access package global vars
import library
print(library.lib_x)

from library.backend import backend_x
print(backend_x)
```

```
<>/20_module_package/code/10_packages/ex2/library/__init__.py
11
<>/20_module_package/code/10_packages/ex2/library/backend/__init__.py
22
```

"Acquire knowledge and impart it to the people."

"Seek knowledge from the Cradle to the Grave."