Modules and testing

Computing & Information Sciences

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Python modules

Python modules

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- Import classes or functions from modules.
  - A Python file as a module.
  - A directory of Python files as a module.
- Better program structure with several files.
  - Group the files into modules.

Modules: single file

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my_code.py

```
def my_function(x):
    return x*2
```

modules.py

```
import my_code

result = my_code.my_function(1.3)
print(result)
```

Main entry point

```
print("Hello") # Run on import and execution.

if __name__ == "__main__":
    print("Main") # Run on execution.
```

```
python3 main.py
```

Output

```
Hello
Main
```

```
>>> import main
```

Output

```
Hello
```

Modules: directory


```
./my_module/functions.py
./my_module/more_functions.py
./my_module/__init__.py
./my_module/__main__.py
./run.py
```

```python
from my_module import functions
from my_module import more_functions
import my_module

functions.fun1()  # From my_module/functions.py
more_functions.fun2()  # From my_module/more_functions.py
my_module.fun3()  # From my_module/__init__.py
```

Unit tests

Purpose of unit tests

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- Validate functions behave as expected.
- Run unit tests to verify that software is stable.
  - Automatically run unit tests before repository branch merge.

Implementing unit tests

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- Write unit tests in separate files.
  - Unit tests are not normally distributed with the software.
  - Same software repository, but not within distributed package.
- Unit test names should match function or functionality.
- Configure software before test.
- Define expected results.

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