PHOT 110: Introduction to programming

Lecture 14: exercises on modules

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Exercises on modules

Modules are separate python script files which contain functions and variables to be imported in other scripts.

Exercise 1: A module for light at an interface

Create a module to calculate the reflected light rays and refracted light rays at a vertical interface. You can use the following example code:

Listing 1 `themodule.py`

```python
def calc_reflection_angle(angle_inc):
    # ...
    # code to calculate the reflection at an interface
    # ...
    #
    return angle_reflection

def calc_refraction_angle(angle_inc, n1, n2):
    # ...
    # code to calculate the refraction at an interface
    # ...
    #
    return angle_refraction
```

Listing 2 `thescript.py`

```python
# Import your module
import themodule as lm

# Parameters
angle_inc = 45

# Calculate the angle of reflection at a vertical interface
angle_reflection = lm.calc_reflection_angle(angle_inc)
print(angle_reflection)

# Calculate the angle of refraction at a vertical interface
# with media n1 = 1, and n2 = 1.5
angle_refraction = lm.calc_refraction_angle(angle_inc, 1, 1.5)
print(angle_refraction)
```