ch_6_assignment

March 21, 2023

Ch_6_assignment

[ ]:
```
from IPython.core.interactiveshell import InteractiveShell
InteractiveShell.ast_node_interactivity = 'all'
```

1 A modular Approach to Program Organization

1.1 Importing Modules

[ ]:
```
# A module is a collection of variables and functions that are grouped together␣
 ↪in a single file.
import math # To gain access to the variables and functions from a module, you␣
 ↪have to import it.

type(math) # Importing a module creates a new variable with that name. That␣
 ↪variable refers to an object whose type is module.
```

[ ]:
```
module
```

[ ]:
```
# When we try to calculate a square root, though, we get an error telling us␣
 ↪that Python is still unable to find function sqrt.
sqrt(9)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[3], line 2
      1 # When we try to calculate a square root, though, we get an error␣
 ↪telling us that Python is still unable to find function sqrt.
----> 2 sqrt(9)

NameError: name 'sqrt' is not defined
```

[ ]:
```
math.sqrt(9)
math.pi
radius = 5
```

```
print('area is ', math.pi * radius ** 2)
```

[ ]: 3.0

[ ]: 3.141592653589793

```
area is  78.53981633974483
```

[ ]:
```
# ombining the module's name with the names of the things it contains is safe, but it isn't always convenient.
# For this reason, Python lets you specify exactly what you want to import from a module.
from math import sqrt, pi
sqrt(9)
radius = 5
print('circumference is', 2 * pi * radius)
```

[ ]: 3.0

```
circumference is 31.41592653589793
```

1.2 Defining your own modules

[ ]:
```
import temperature
celsius = temperature.convert_to_celsius(33.3)
temperature.above_freezing(celsius)
```

[ ]: True

1.2.1 What Happens During Import

[ ]:
```
import experiment
```

```
The panda's scientific name is 'Ailuropada melanocleuca'
```

[ ]:
```
import experiment
```

we'll change the file contents

[ ]:
```
import imp
imp.reload(experiment)
```

```
The koala's scientific name is 'Phascolarctos cinereus'
```

```
/var/folders/r1/8vnnkyjn3h3b_tnp2010w6nm0000gn/T/ipykernel_7211/7133015.py:1:
DeprecationWarning: the imp module is deprecated in favour of importlib; see the
module's documentation for alternative uses
  import imp
```

[ ]:
```
<module 'experiment' from '/Users/Kim_Tein/INU/inu_data/physics_programming/assignment/Ch_6/experiment.py'>
```

1.2.2 Selecting Which Code Gets Run on Import: main

[ ]:
```
import echo
print("After import, __name__ is", __name__,
      "and echo.__name__ is", echo.__name__)
```

```
__name__ is echo
After import, __name__ is __main__ and echo.__name__ is echo
```

[ ]:
```
if __name__ == "__main__":
    print("I am the main program.")
else:
    print("Another module is importing me.")
```

```
I am the main program.
```

[ ]:
```
# Enter the degrees in Fahrenheit : 35
import temperature_program
```

```
It is above freezing.
```

[ ]:
```
# Enter the temperture in degrees Fahrenheit : 15
# Enter the bakin temperature in degrees Fahrenheit : 500
import temperature_program
import baking
```

```
It is below freezing.
Preheat oven to 500.0 degrees F( 260.0 degrees C).
```

[ ]:
```
# Enter the baking temperature in degrees Fahrenheit : 500
import imp
imp.reload(baking)
```

```
Preheat oven to 500.0 degrees F( 260.0 degrees C).
```

[ ]:
```
<module 'baking' from
'/Users/Kim_Tein/INU/inu_data/physics_programming/assignment/Ch_6/baking.py'>
```

[ ]:
```
import temperature_program
import doctest
doctest.testmod(temperature_program)
```

[ ]:
```
TestResults(failed=0, attempted=3)
```

[ ]:
```
import imp
imp.reload(temperature_program)
doctest.testmod(temperature_program)
```

```
**********************************************************************
File "/Users/Kim_Tein/INU/inu_data/physics_programming/assignment/Ch_6/temperatu
re_program.py", line 5, in temperature_program.convert_to_celsius
Failed example:
    convert_to_celsius(75)
Expected:
    23.88888888888889
Got:
    57.22222222222222
**********************************************************************
1 items had failures:
   1 of   1 in temperature_program.convert_to_celsius
***Test Failed*** 1 failures.
```

```
/var/folders/r1/8vnnkyjn3h3b_tnp2010w6nm0000gn/T/ipykernel_13756/1575060112.py:1
: DeprecationWarning: the imp module is deprecated in favour of importlib; see
the module's documentation for alternative uses
  import imp
```

[ ]:
```
TestResults(failed=1, attempted=3)
```

Reference * Title: Physics Programming Lecture Note (INU) * Author: Jeongwoo Kim, Ph.D. * Availability: https://sites.google.com/view/jeongwookim

---