CSCA08F18

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Basic Types

- int
- float
- bool
- NoneTypes

Object Types

- str
- function / method
- Other objects types

Operator & Operands

Arithmetic Operators

- **
- *, /, //, %
- +, -

Boolean Operators

- ()
- >, <, >=, <=, ==, !=, in
- not
- and, or

evaluate (not 4 / 2 > 3 + 5 ** 2) == (not (3+ 5) ** 2 / 4 + 54 / 3 - 10 < 2)

Strings

- Single quotes (‘)
- double quotes(“ not 2 single quotes)
- triple quotes (three of only single or double quotes)

Strings

- a = ‘01234’
- a[0]
- a[-1]
- a[:3]
- a[1:]
- a[:-1]

Operators on Strings

- Compare with <, <=, >, >=, ==, !=
- *

Functions & Methods

- Like a short hand name for a bunch of code
  - may or may not use input
  - may or may not have output
- Function: standalone object
- Method: function part of an object

Function Design Recipe

- Examples
- Header with Type Annotation
- Description
- Body
- Test

Docstring

- Description
- Precondition
- Examples

Type Annotations

- Include type of each parameter
- Annotate return type
- def summation(first: int, second: int) -> int:

```
def area(width: float, length: float) -> float:

 “““Return the product of width and length, and print the string ‘Hi’

 Examples:

   >>> area(3.0, 2.0)

  Hi

 6.0

 >>> area(0.1, 2.0)

 Hi

 0.2

 ”””

 print(‘Hi’)

 return width * length
```

Nested Functions Calls

- Can call a function in a function
- Can call a function as an argument

Rules of Evaluation

- Left to right
- Variables and literals
- Operands then operators
- Arguments
- [Nested] functions / method calls

```
x = 24

min(max(x, 15 + 2), 44, 32 / 3) / 4 + 2
```

```
max(44, sqrt(144) / 2 + 5) * min(15, 5**2)
```

Range Function

- Used in for loops (usually)
- range([start,] stop [, step])

For Loops

- for i in range(start, stop, step)
- Includes start but excludes end
- Changes i by step for each iteration
- Can be negative!

if

- Give you an option to run or not run the code
- if boolean expression

elif

- Requires an if statement to be used
- Only executed if preceding if statement is false
- elif boolean expression:

else

- Must be used in conjunction with an if statement
- Code ran only if all if and elif statements are false
- else:

Memory Model