THE UNIVERSITY OF MELBOURNE

COMP10001

Foundations of Computing

Semester 1, 2021

Tutorial 2

Andrew Naughton

andrew.naughton@unimelb.edu.au

THE UNIVERSITY OF MELBOURNE

Outline

- Data Types
- Operators
- Variables
- Exercises
- Problems (time permitting)

THE UNIVERSITY OF MELBOURNE

Data Types

- What is a data type?
  - Classification of data, e.g. str, int, float, bool
  - Defines:
    - How Python stores and processes it
    - What programmers can do with it
- Can the data type of an object change?
  - Yes – if you can convert/cast the object to another data type

THE UNIVERSITY OF MELBOURNE

str

- Example: “Check out this string”
- Stores: A sequence of characters
- Scope of use:
  - Handy functions: len, print, input
  - Handy methods: isdigit, isalnum, isupper, islower
- How to convert: str(<value to convert>)
- Note: Can be defined within single or double quotes or even triple double quotes

THE UNIVERSITY OF MELBOURNE

int

- Examples: 42, 550_377
- Stores: A whole number (integer)
- Scope of use:
  - Arithmetic operations
  - Counting and numbering
- How to convert: int(<value to convert>)

THE UNIVERSITY OF MELBOURNE

float

- Examples: 5.0, 3.1415
- Stores: A number with a decimal point
- Scope of use:
  - Arithmetic operations
  - Mathematics & real world measurements
- How to convert: float(<value to convert>)

THE UNIVERSITY OF MELBOURNE

bool

- Examples: True, False
- Stores: A truth value
- Scope of use:
  - Conditional statements
  - Arithmetic operations
    - >>> True + 4 = 5
    - >>> False + 4 = 4
- How to convert: bool(<value to convert>)

THE UNIVERSITY OF MELBOURNE

Operators

- A symbol placed between two operands
- Used to calculate some result
- Examples:
  - + (addition)
  - – (subtraction)
  - * (multiplication)
  - / (division)
  - // (integer division)
  - % (modulo)
  - ** (exponential)

THE UNIVERSITY OF MELBOURNE

Operator Overloading

- When an operator works in slightly different ways for operands of different data types
- "+" operator example:
  - 1 + 1 => 2
  - 1 + 1.0 => 2.0
  - "What's " + "up?" => "What's up?"

THE UNIVERSITY OF MELBOURNE

Variables

- A place in the computer's internal memory where a value can be stored
- We use a name/identifier to access this variable
- Created using "=", which is the assignment operator
- The left operand is the variable name
- The right operand is the value
- Example:
  - greeting = "Welcome all."

THE UNIVERSITY OF MELBOURNE

Variables

- How do they help?
  - Can refer back to the same value more easily
  - Can refer to a value using a descriptive, meaningful name
  - Easy to update
  - Can be used in calculations

THE UNIVERSITY OF
MELBOURNE

Exercises

THE UNIVERSITY OF MELBOURNE

Reminder

Grok Worksheets 3, 4 & 5 are due Monday 22/3 at 11:59pm