Applied Data Analytics

Python basics

Scalar data types

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What is a variable type?

- The type indicates the type of information stored in a variable

  - int: An Integer

  - float: A real number (approximation)

  - Boolean: True or False

- Types are inferred upon assignment

How to inspect and change variables types

```
[1]  type(3)
[1]  'int'

[2]  a = 3
     type(a)
[2]  'int'

[3]  b = float(a)
     b
[3]  3.0

[4]  type(b)
[4]  'float'
```

- Types can be inspected with `type()`

- The type of a variable can be changed using the functions:

  - int()
  - float()
  - bool()

- A variable type cannot be always changed

  - e.g. `"hello"` cannot be converted into int

Representing numbers: ints and floats

```
[1] b = 3.1415
    type(b)
[1] 'float'

[2] c = 0.1 + 0.2
    c
[2] 0.30000000000000004

[3] a = 2
    b = 3.1415
    c = a + b
    type(c)
[3] 'float'
```

- Floats represent real numbers

- They are imperfect representations

- When performing operations involving ints and floats, ints are automatically converted into floats

Representing True and False: Booleans

```
[1]  a = True
     b = False
     type(a)
[1] 'bool'

[2]  a = 3
     b = 3
     a < b
[2] False

[3] int(True)
[3] 1

[4] bool(6)
[4] True
```

- Booleans can be `True` or `False` (case sensitive)

- The result of a comparison is a Boolean

- `True` or `False` are interpreted as 1 and 0

- All int and floats different from 0 are converted to `True`