

Lecture 8 - Functions and conditionals

* prayer/spiritual thought

* announcements

* unit of the day

$$1 \text{ kcal} = 4184 \text{ J}$$

↑ approximately the amount of
energy to raise 1 kg of water
1°C at 1 atm of pressure.

- counterpart of BTU

⊛ today's lecture consists mainly of examples.

I. Conditionals

See example script

We cover:

* The if statement, syntax, variables

* else & elif statements

* nesting & multiple elif statements

* one-line if statements

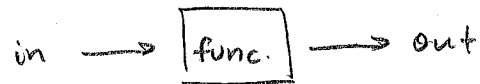
Practice - conditionals

* Debug the practice example

II. Functions

* what is a function?

- A mapping



• formulas , e.g. $f(x) = x^2$

• non-formulas , e.g. $g('cba') = 'abc'$

- An abstraction. A chunk of code

• A way to organize code

• A way to re-use code

(see example script)

we cover:

* Libraries of functions

- Built-in functions

- standard libraries : math

- numpy : numerical python (fast numerical arrays)

- scipy : scientific python (numerical methods)

- matplotlib : plotting

- syntax of using libraries

```
import math
```

```
import numpy as np
```

```
from scipy import linalg
```

```
from math import *
```

* Function syntax

- calling a function
- defining a function
- docstrings & help

* Function order & driver functions

* Scope: global & local variables

* Function arguments

- defaults
- other functions
- order

* lambda functions

Practice - Functions