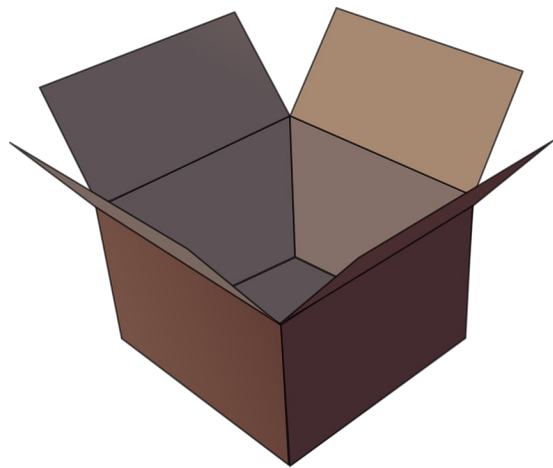# Learning Python Review

Variable

- X is a variable
- Variable is a box, that can hold different data in it.
- The name of the variable is the label of the box
- You can change what is in the box,
    - by doing assignment operation
    - x = 10
    - x = "a" // quotes
    - x = "apple"
    - x = True
- Python compiler always want to know what is in the box.
- If there is nothing in the box, we can assign variable to None

Data Types

- There are **four** basic types of data in python
    - Different data type supports different operations
- Number
    - Integer or decimal
    - math operations
- String - Quotes
    - Index operations
    - concatenate operation
- True/False
    - Logical operations
    - And/or
- None

Math operation on numbers

- x = 1
- x = x + 1
- y = 2
- x = x + y
- x = 3 * x
- y = x / 5   // Integer and decimal
- y = y * 5
- 3 % 2 (modular)

String operation

- Index operation
    - x = "play"
    - print (x[0])
    - print (x[1])
- Concatenate operation
    - x = 'apple'
    - y = ' is '
    - z = x + y + 'sweet'

List

- A list is a collection of data
- You can mix the data types in a list
- List has order and indexes
- String is a list of characters
  - Index operation
  - Concatenate operation
  - x = [1]
  - y = [2]
  - print (x + y)
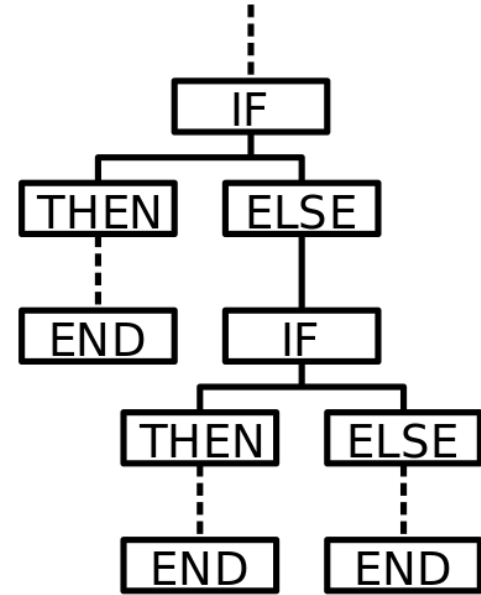
Indentation

-   The spaces before your code starts in the line
-   Signify code blocks, it has to be aligned.
    -   Conditional
    -   Loop
    -   Function

If/else conditionals structure

- Test on True/False
- True can be 1, 'a', "apple", [1]
- False can be None, '', [], 0
- Elif - Another condition

```
              IF
         ┌─────┴─────┐
       THEN        ELSE
        ┊            │
       END          IF
                ┌────┴────┐
              THEN      ELSE
               ┊         ┊
              END       END
```

More on List

- Functions (parenthesis)
  - print()
  - input()
- len() function
- range() function

For Loop

- Loop through list or string (string is a list!)
- For i in list:
- Keep going through each value in the list while condition is met
- For variable_name in list_name:
  - do operation on the variable name

For loop variable scopes

- First appears before the loop
  - visible inside the loop and after the loop
- First appears inside the loop
  - Only visible inside the loop

For loop inside controls

- Condition inside loop
  - The variable inside the loop is not visible outside.
- Skip one iteration
  - continue
- Break
  - End loop early

While loop

- Only care about stop condition
- variable scope
- conditional/continue/break

File operation

- fin
    - with open (filename, 'r') as fin
- fout
    - fout = open(filename, "w")
    - fout.write(str)
    - fout.close()