Week 1 - Lesson 1: Core Types & Control Flow (Python)

What you should be able to do after this lesson: read simple code accurately, write loops/conditions without guessing, and avoid common beginner mistakes.

Core Types You Will Use

Type	Example	Use it for...
int / float	3, 3.14	Math, counters, totals.
str	'hello'	Text, user input, messages.
bool	True/False	Conditions (if/while).
list	[1,2,3]	Ordered items (tasks, expenses).
dict	{'id': 1}	Record/object-like data.
None	None	Missing value / not set yet.

Control Flow: if / elif / else

Python runs the first condition that is True and skips the rest.

```
score = 72
if score >= 90:
  grade = 'A'
elif score >= 60:
  grade = 'Pass'
else:
  grade = 'Fail'
```

Truthiness shortcut:

Falsy values: 0, 0.0, '', [], {}, set(), None. Everything else is truthy. Example: **if items:** means the list is not empty.

Loops: for / while

Important: **for x in items** gives you values, not the number of elements.

```
items = [1, 2, 3, 4]
total = 0
for n in items:
  if n % 2 == 0:
    total += n
print(total) # 6
```

Need a counter? Use **range** or **enumerate**:

```
for i in range(3):
  print(i) # 0, 1, 2

for i, n in enumerate(items):
  print(i, n)
```

while repeats until the condition becomes False:

```
x = 3
while x > 0:
  x -= 1
```

break exits a loop early • **continue** skips to the next iteration.

Patterns (you will reuse in your CLI project)

- **Accumulate** (totals, counts).
- **Filter** (keep only matching items).
- **Search** (find first match, then break).
- **Validate input** (loop until valid).

Beginner mistakes to avoid

- Mixing up **value** vs **index** in loops.
- **input()** returns a string - validate, then convert with **int()**/**float()**.
- Range is end-exclusive: **range(5)** is 0..4.

Mini practice

- Given **nums = [3, 10, 7, 2]**, compute the sum of numbers greater than 5.
- Write a loop that prints numbers from 5 down to 1.
- Given **text = 'aabccc'**, count how many 'c' characters exist.
- Given a list, print the first even number, or print 'none' if there is no even number.