ChatGPT

Python Loops - Notes

1. `for` loop

Used to iterate over a sequence (list, string, range, etc.)

Syntax:

```
for variable in sequence:
    # code block
```

Example:

```
fruits = ['apple', 'banana', 'cherry']
for fruit in fruits:
    print(fruit)
```

With `range()`:

```
for i in range(3):
    print(i)
```

Output:

```
0
1
2
```

---

2. `while` loop

Repeats as long as a condition is True

Syntax:

```
while condition:
    # code block
```

Example:

```
count = 0
while count < 3:
    print(count)
    count += 1
```

Common Features in Both Loops

`break`: exits the loop

```
for i in range(10):
    if i == 5:
        break
    print(i)
```

`continue`: skips the current iteration

```
for i in range(5):
    if i == 2:
        continue
    print(i)
```

`else` with loop: runs only if loop isn't broken with `break`

```
for i in range(3):
    print(i)
else:
    print("Finished without break!")
```

⚠ Common Errors

Error	Cause	Example
`TypeError`	Loop over non-iterable	`for i in 10:`
`IndentationError`	Improper indentation	Not indenting
Infinite Loop	Condition never becomes False	`while True:`
`UnboundLocalError`	Using var before assigning inside loop	`print(x)` before `x=0`

Advanced Usage

`enumerate()` to get index + value

```python
for index, value in enumerate(['a', 'b', 'c']):
    print(index, value)
```

`zip()` to loop over two sequences

```python
names = ['Aadit', 'Tania']
scores = [99, 88]

for name, score in zip(names, scores):
    print(name, score)
```

Which Loop to Use?

Use Case	Loop Type
Fixed repetitions or sequence iteration	`for`
Conditional repetition	`while`