Python Basics for Data Science (Part-01)

Live Class Regulations

- **No Simultaneous Practice:** Please do not practice coding while I'm demonstrating. Just focus on understanding.
- **Watch First, Practice Later:** Coding demos are for learning. We'll have enough time for hands-on practice afterwards.
- **Stay Relevant:** Avoid asking off-topic or irrelevant questions during the session.
- **Mic Discipline:** Keep your microphone muted unless you're asked to speak.
- **Old Class Confusions?** Ask Later! If you have questions about previous classes, please ask them at the end of today's session. Let's not interrupt the current flow.

Let’s Start…

Required Software

- Python 3 (Latest Version)
- Jupyter Notebook
- Anaconda

```
python –version
python -m pip install --upgrade pip
pip install notebook
```

Python I/O

- We use the print() function to output data to the standard output device (screen).
  - print(‘Hello World!’)

- The input() method reads a line from the input, converts it into a string, and returns it.
  - input(‘Enter anything ’)

Python Variables

- Variables are like a container for storing data.
- Compared to other programming languages, Python has no command for declaring a variable.
- A variable is created the moment you first assign a value to it.

Example:

Var = ‘data science’

Var2 = ‘study mart’

List of Keywords in Python: **Go to this link!**

Python Variables

A variable can have a short name (like x and y) or a more descriptive name.

- Keywords can’t use as a variable.
- A variable name must start with a letter or the underscore (_) character.
- A variable name cannot start with a number.
- A variable name can only contain alpha-numeric characters and underscores (A-Z, 0-9, and _).
- Variable names are case-sensitive (x, X, _x are three different variable).

Valid Example:

```
Var = 10
Var2 = 100
_var = 20
Var_2 = 10
V1a2r3 = 30
My_name = ‘shakil’
```

Invalid Example:

```
9Var = ‘data science’
Var-2 = ‘study mart’
&var = 20
My name = ‘shakil’
```

Python Variables

Multiple

- Multiple Variables:
  - x, y, z = “Data", “Science", “Smart“ -> Valid
  - x, y, z = “Data", “Science“ -> Invalid
- Comments:
  - Single Line
  - Multiple Line

Python Variables

Local Vs. Global

- Multi Word Variable Name
  - camelCaseVar
  - PascalCaseVar
  - snake_case_var

- Global Variable: Variables that are created outside of a function are known as global variables. Global variables can be used by everyone, both inside of functions and outside.

- Local Variable: Variables that are created inside of a function are known as local variables. local variables can be used inside of the function.

Strings

All about Python Strings

X = ‘Data Science’

Y = ’10’

Z = Something

- String Formatting
- String Concatenation
- String methods

Conditional Statements

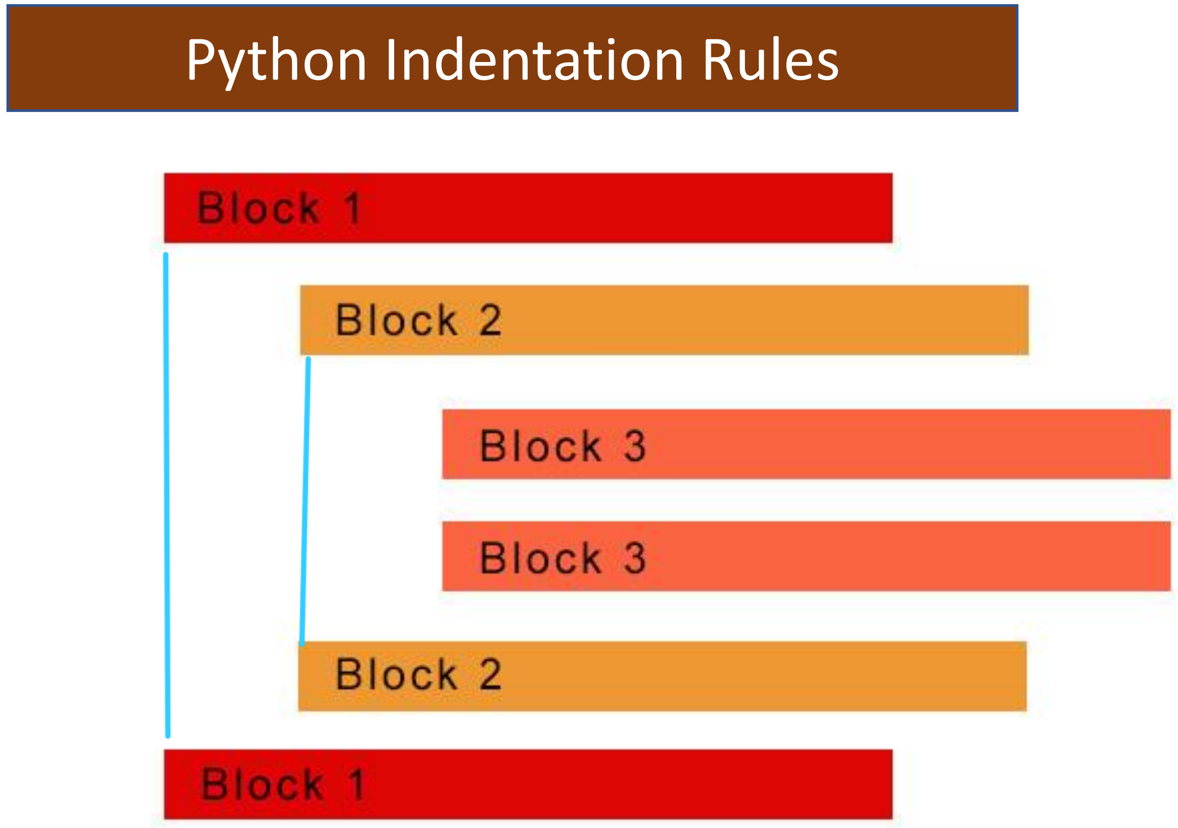
If, else

Python supports the usual logical conditions from mathematics:

- Equals: a == b
- Not Equals: a != b
- Greater than a > b
- Greater than or equal to a >= b
- Less than a < b
- Less than or equal to a <= b

Conditional Statements

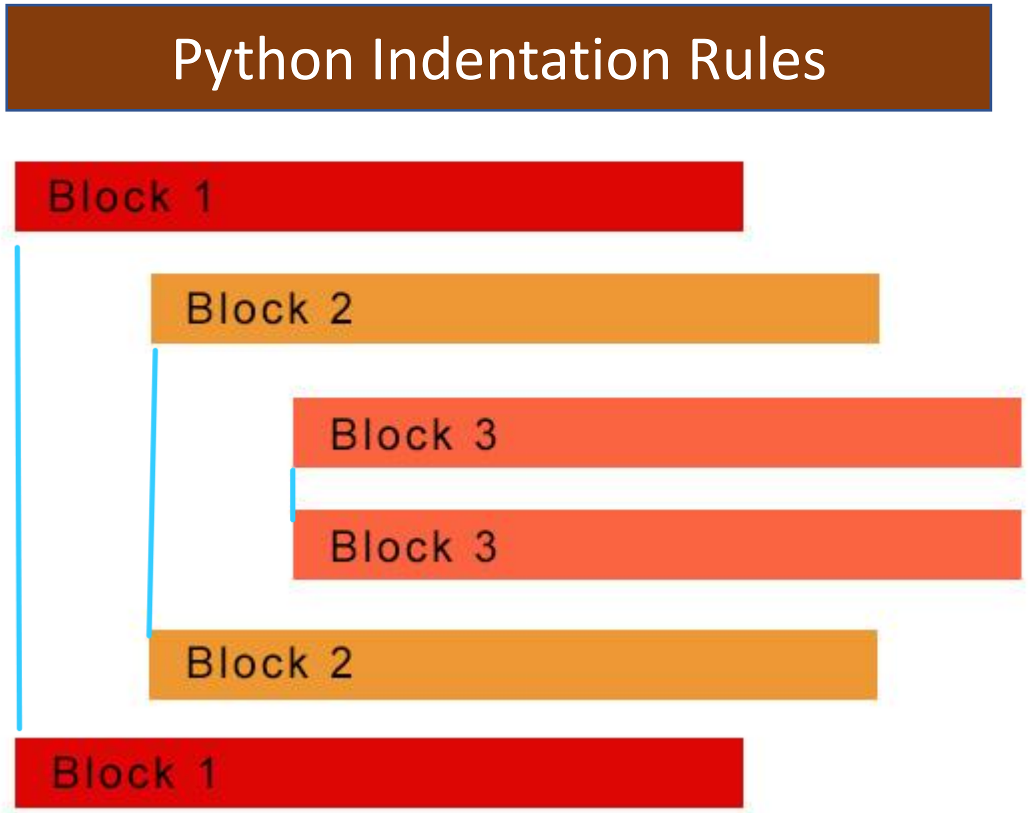
If, else



```
x = 50
y = 100

if y > x:
    print(“y is greater than x")

elif x == y:
    print(“ x and y are equal")

else:
     print(“ x is y greater than y ")
```

Conditional Statements

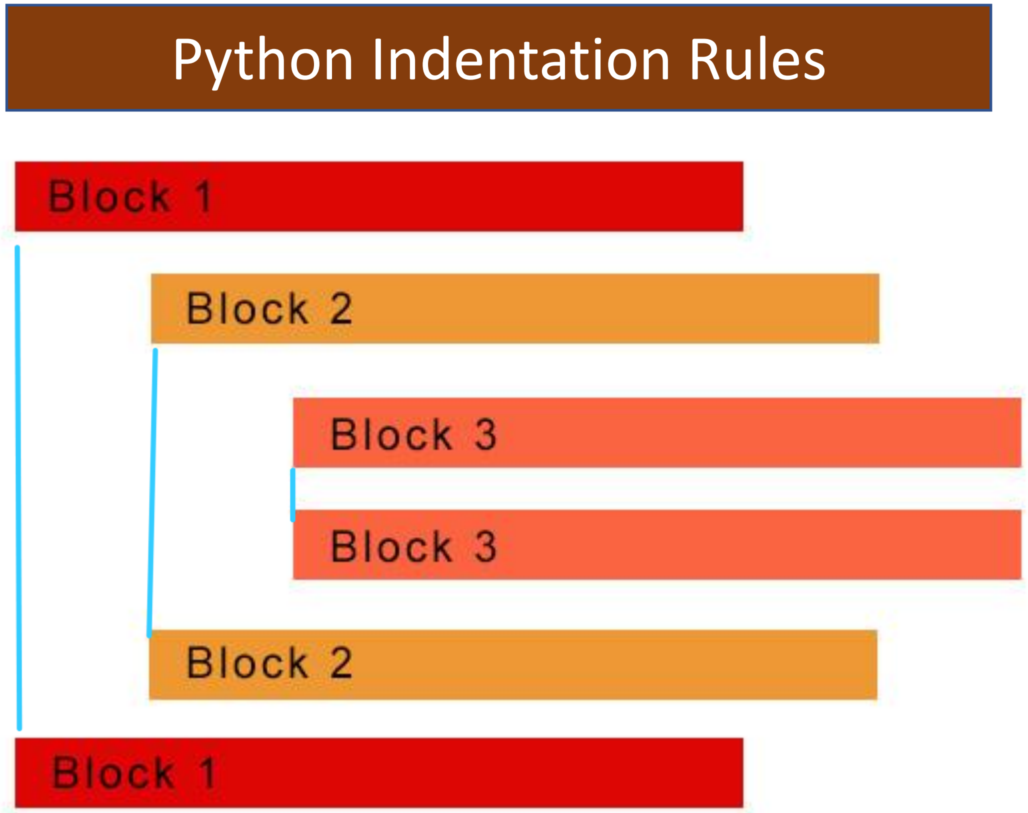
If, else



```
scores = [85, 92, 78, 60, 45]

for score in scores:
    if score >= 90:
        grade = "A"
    elif score >= 80:
        grade = "B"
    elif score >= 70:
        grade = "C"
    elif score >= 60:
        grade = "D"
    else:
        grade = "F"

    print(f"Score: {score}, Grade: {grade}")
```

Conditional Statements

If, else



```
scores = [85, 92, 78, 60, 45]

for score in scores:
    if score >= 90:
        grade = "A"
    else:
        if score >= 80:
            grade = "B"
        else:
            if score >= 70:
                grade = "C"
            else:
                if score >= 60:
                    grade = "D"
                else:
                    grade = "F“

    print(f"Score: {score}, Grade: {grade}")
```

Loops

for

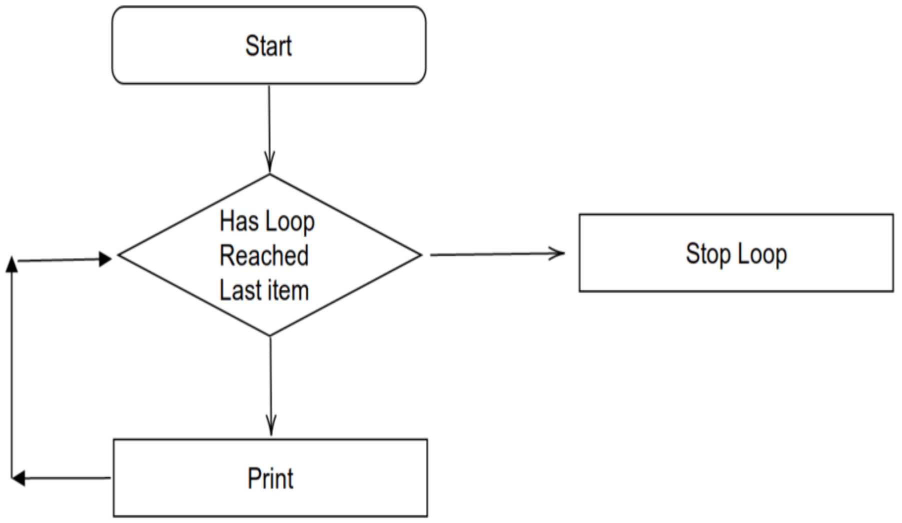
Example

```
subjects = [“ai", “data science", “statistics“, ”math”]
for x in  subjects :
            print(x)
```

Output:

```
“ai“
“data science“
“statistics“
”math”
```

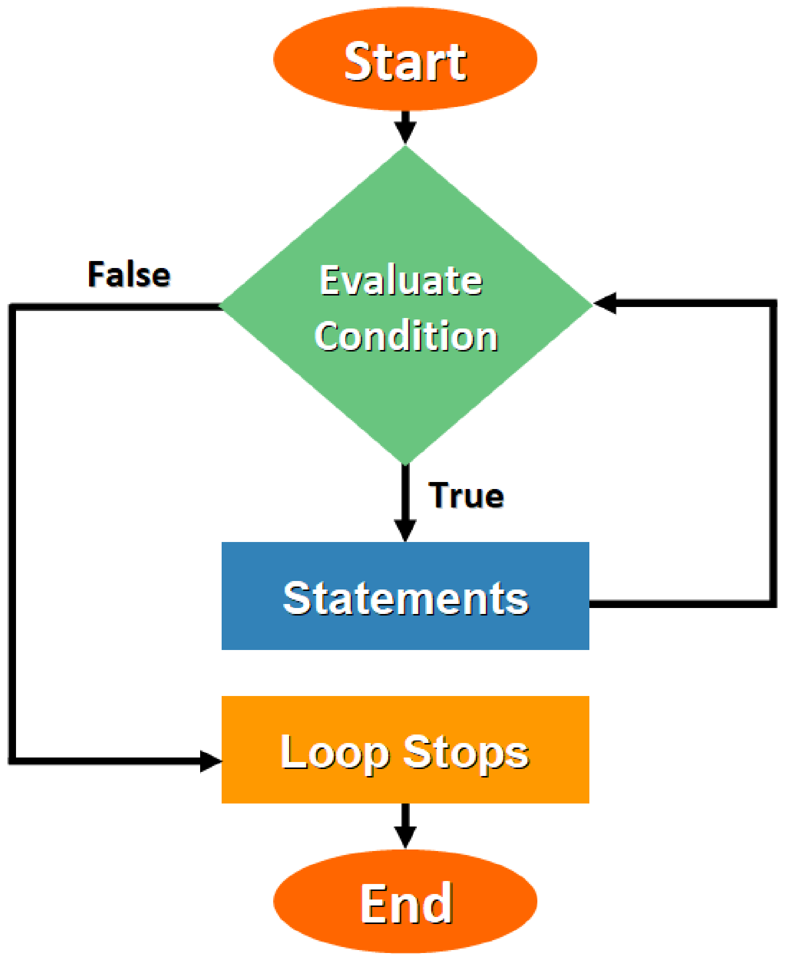
For Loop



Loops

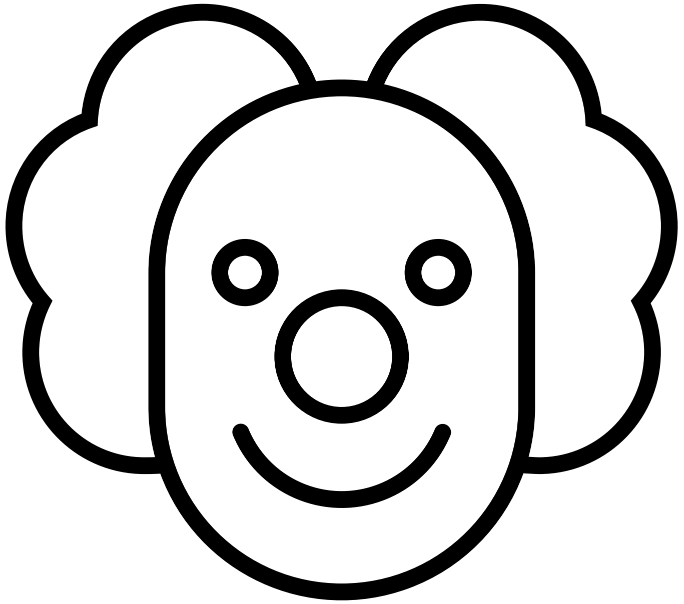
while

```
counter = 1

while counter <= 5:
    print(counter)
    counter += 1
```



For Vs. While

`for` Loop	`while` Loop
Use when the number of iterations is fixed.	Use when the number of iterations is unknown.
Stops after iterating through a sequence or range.	Stops based on a condition you define.
Not ideal for infinite loops.	Best suited for infinite loops (with `break`).
Easier and more concise for sequences.	Better for loops where stopping condition isn't sequence-driven.



Thank you!