

Basic Syntax

Comments

Single line: Use # symbol

Multi-line: Use triple quotes " " " or '''

Inline comments: Add # at end of line

Print Function

Basic output: `print()` function displays text

Multiple values: Separate with commas

String formatting: Use *f-strings*, `format()`, or `%` formatting.

Indentation

Critical in Python - Defines code blocks

Use 4 spaces - Standard convention

Consistent indentation - All lines in same block must have same indentation

Data Types

int	Whole numbers
float	Decimal Numbers
complex	Real + imaginary
str	Character strings
Immutable	Can't change chars
Unicode	International support
bool	True/False Values
list	Ordered, mutable
tuple	Ordered, immutable
dict	Key-value pairs
set	Unique elements only

Data types include numeric, text, boolean, and collections.

Naming Rules

Start	Letter or underscore
Characters	alphanumeric + underscore
No reserved words	if, for, class
Convention	snake_case

Variable Declaration

No keyword needed	Just assign
Dynamic typing	Auto-determined
Case sensitive	myvar ≠ MyVar
Multiple assignment	One line



By **Muhammad Usman Asghar** (musmankkh)

cheatography.com/musmankkh/

Published 3rd August, 2025.
Last updated 3rd August, 2025.
Page 1 of 7.

Sponsored by **ApolloPad.com**
Everyone has a novel in them. Finish Yours!
<https://apollopad.com>

Formatting

f-strings	<code>f"Hello {name} "</code>
format()	<code>" Hello {}".format (name)</code>
% style	<code>" Hello %s" % name</code>

String Methods

Case	<code>upper(), lower(), title()</code>
Search	<code>find(), index(), count()</code>
Check	<code>startswith(), endswith()</code>
Modify	<code>replace(), strip(), split()</code>

String Operations

Concatenation	<code>+ operator</code>
Repetition	<code>* operator</code>
Length	<code>len() function</code>
Indexing	<code>[0] zero-based</code>
Slicing	<code>[start:end:step]</code>

Strings (Creation Methods)

Single quotes	<code>'Hello'</code>
Double quotes	<code>"Hello"</code>
Triple quotes	Multi Line
Raw strings	<code>r 'literal'</code>

Conditionals

if	Basic condition check
elif	Additional conditions
else	Default
Operators	<code>==, !=, <, ></code>
Logic	<code>and, or, not</code>

Loops

For	Iterate sequences
While	Condition-based
range()	Number Sequence
enumerate()	Index + Value
zip()	Multiple sequence



By **Muhammad Usman Asghar** (musmankkh)

Published 3rd August, 2025.
Last updated 3rd August, 2025.
Page 2 of 7.

Sponsored by **ApolloPad.com**
Everyone has a novel in them. Finish Yours!
<https://apollopad.com>

Loop Control

break	Exit loop
continue	Skip iteration
else	Normal completion
pass	Empty placeholder

Functions

Definition

- def keyword: Define function
- Parameters: Input values
- Return: Output value
- Docstrings: Documentation

Arguments

- Positional: Order matters
- Keyword: Use parameter names
- Default: Provide default values
- Variable: *args*, **kwargs*

Types

- Built-in: print(), len(), type()
- User-defined: Custom functions
- Lambda: Anonymous functions
- Generator: Uses yield

Scope

- Local: Inside function
- Global: Outside functions
- global: Modify global vars
- nonlocal: Enclosing scope

Built-in Functions

Essential

- print(): Output to console
- input(): Get user input
- len(): Sequence length
- type(): Object type
- isinstance(): Check type

Conversion

- int(), float(), str()
- list(), tuple(), set()
- ord(), chr(): Char conversion

Mathematical



By **Muhammad Usman Asghar** (musmankkh)

cheatography.com/musmankkh/

Published 3rd August, 2025.
Last updated 3rd August, 2025.
Page 3 of 7.

Sponsored by **ApolloPad.com**
Everyone has a novel in them. Finish Yours!
<https://apollopad.com>

Built-in Functions (cont)

- `abs()`: Absolute value
- `round()`: Round numbers
- `min()`, `max()`: Extremes
- `sum()`: Sequence sum
- `pow()`: Power calculation

Sequence

- `range()`: Number sequences
- `enumerate()`: Add indices
- `zip()`: Combine iterables
- `sorted()`: Sort sequence
- `all()`, `any()`: Boolean ops

File Handling

Operations

- `open()`: Open file for I/O
- Modes: 'r', 'w', 'a', 'x'
- Text/Binary: 't', 'b' modes
- `close()`: Close file

Reading

- `read()`: Entire file
- `readline()`: Single line
- `readlines()`: All lines
- Iteration: Loop through lines

Writing

- `write()`: Write string
- `writelines()`: Write list
- Context manager: with statement

</d iv>

<div style= " flex: 1;">

Error Handling

<code>try</code>	Code that may fail
<code>except</code>	Handle exceptions
<code>else</code>	No exception occurred
<code>finally</code>	Always execute
<code>raise</code>	Trigger exception

Handling



By **Muhammad Usman Asghar** (musmankkh)

cheatography.com/musmankkh/

Published 3rd August, 2025.
Last updated 3rd August, 2025.
Page 4 of 7.

Sponsored by **ApolloPad.com**
Everyone has a novel in them. Finish Yours!
<https://apollopad.com>

Error Handling

SyntaxError	Invalid syntax
NameError	Undefined variable
TypeError	Wrong data type
ValueError	Wrong Value
IndexError	List index error
KeyError	Dict key missing

Exception Types

Object-Oriented Programming

Classes and Objects

- class keyword – Define class
- Object instantiation – Create instances
- Instance variables – Data unique to each object
- Class variables – Data shared by all instances
- self parameter – Reference to current instance

Methods

- Instance methods – Access instance data
- Class methods – Work with class data (@classmethod)
- Static methods – Independent functions (@staticmethod)
- Special methods – init, str, repr, etc.

Inheritance

- Parent class – Base class being inherited
- Child class – A class that inherits
- super() function – Access parent class methods
- Method overriding – Redefine parent methods
- Multiple inheritance – Inherit from multiple classes

Encapsulation

- Private attributes – Prefix with underscore(s)
- Property decorator – Create getter/setter methods
- Name mangling – Double underscore prefix
- Public interface – Methods meant for external use

Polymorphism

- Same interface, different implementations
- Duck typing – "If it looks like a duck..."
- Method overloading – Not directly supported
- Operator overloading – Define behavior for operators



By **Muhammad Usman Asghar** (musmankkh)

cheatography.com/musmankkh/

Published 3rd August, 2025.
Last updated 3rd August, 2025.
Page 5 of 7.

Sponsored by **ApolloPad.com**
Everyone has a novel in them. Finish
Yours!
<https://apollopadd.com>

Data Structures

Lists

- Ordered, mutable, duplicates OK
- Methods: `append()`, `insert()`, `remove()`
- Access: indexing `[0]`, slicing `[1:3]`
- Sort: `sort()`, `reverse()`

Tuples

- Ordered, immutable, duplicates OK
- Methods: `count()`, `index()`
- Packing/Unpacking: Multiple assignment
- Faster than lists

Dictionaries

- Key-value pairs, mutable
- Methods: `get()`, `keys()`, `values()`
- Access: `dict[key]` or `dict.get(key)`
- Update: `update()`, `pop()`

Sets

- Unordered, unique elements
- Methods: `add()`, `remove()`, `union()`
- Operations: intersection, difference
- Membership: fast in testing

Industry Applications

Web Development

- Backend APIs – RESTful services, GraphQL
- Full-stack frameworks – Django, FastAPI
- Microservices – Flask, FastAPI
- Content management – Django CMS, Wagtail

Data Science & Analytics

- Data analysis – Pandas, NumPy
- Machine learning – Scikit-learn, TensorFlow, PyTorch
- Data visualisation – Matplotlib, Seaborn, Plotly
- Big data – PySpark, Dask

Automation & Scripting

- System administration – Automate server tasks
- Web scraping – BeautifulSoup, Scrapy
- Task automation – Schedule, monitor processes
- DevOps tools – Ansible, Fabric

Scientific Computing

- Research computing - SciPy ecosystem



By **Muhammad Usman Asghar** (musmankkh)

cheatography.com/musmankkh/

Published 3rd August, 2025.
Last updated 3rd August, 2025.
Page 6 of 7.

Sponsored by **ApolloPad.com**
Everyone has a novel in them. Finish Yours!
<https://apollopad.com>

Industry Applications (cont)

- Bioinformatics – BioPython
- Astronomy – AstroPy
- Physics simulations – NumPy, SciPy

Game Development

- Pygame – 2D game development
- Panda3D – 3D game engine
- Game scripting – Embed Python in games
- Game tools – Level editors, asset pipelines

Learning Resources

Official Documentation

- python.org – Official Python documentation
- PEP documents – Python Enhancement Proposals
- Library reference – Standard library documentation
- Language reference – Complete language specification

Online Tutorials

- W3Schools
- Python.org tutorial
- Real Python
- Codecademy

Practice Platforms

- LeetCode – Coding interview preparation
- HackerRank – Programming challenges
- Codewars – Coding kata and challenges
- Project Euler – Mathematical programming problems



By **Muhammad Usman Asghar** (musmankkh)

cheatography.com/musmankkh/

Published 3rd August, 2025.
Last updated 3rd August, 2025.
Page 7 of 7.

Sponsored by **ApolloPad.com**
Everyone has a novel in them. Finish
Yours!
<https://apollopad.com>