

What is JSON?

JSON is a lightweight data format used for **data exchange** (e.g., between servers and clients). It looks like a Python dictionary, but it's a **text-based format**.

Example JSON:

```
{
  "name": "Raj",
  "age": 24,
  "isStudent": true,
  "skills": ["Python", "JavaScript"]
}
```

Python's `json` Module

Python has a built-in module called `json` to work with JSON.

`json` (JSON Data Handling)

- `json.dumps(obj)` – Convert Python object to JSON string
- `json.loads(json_str)` – Convert JSON string to Python object
- `json.dump(obj, file)` – Write JSON to a file
- `json.load(file)` – Read JSON from a file

1. Convert Python to JSON (`json.dumps`)

Use `json.dumps()` to convert **Python dict** → **JSON string**.

```
import json

data = {
    "name": "Raj",
    "age": 24,
    "skills": ["Python", "JavaScript"]
}

json_data = json.dumps(data)
print(json_data)
```

Output:

```
{"name": "Raj", "age": 24, "skills": ["Python", "JavaScript"]}
```

2. Convert JSON to Python (`json.loads`)

Use `json.loads()` to convert **JSON string** → **Python object**.

```
import json

json_string = '{"name": "Raj", "age": 24}'
data = json.loads(json_string)
print(data["name"]) # Output: Raj
```

3. Write JSON to a File (`json.dump`)

```
data = {"name": "Raj", "age": 24}

with open("data.json", "w") as f:
    json.dump(data, f)
```

4. Read JSON from a File (`json.load`)

```
with open("data.json", "r") as f:
    content = json.load(f)
    print(content["name"])
```

5. Pretty Printing JSON

```
print(json.dumps(data, indent=4))
```

Use the **indent** parameter to define the numbers of indents for better readability

When you convert from Python to JSON, Python objects are converted into the JSON (JavaScript) equivalent:

| Python | JSON |
|--------|--------|
| dict | Object |
| list | Array |
| tuple | Array |
| str | String |
| int | Number |
| float | Number |
| True | true |
| False | false |
| None | null |

```
import json

print(json.dumps({"name": "John", "age": 30}))
print(json.dumps(["apple", "bananas"]))
print(json.dumps(("apple", "bananas")))
print(json.dumps("hello"))
print(json.dumps(42))
print(json.dumps(31.76))
print(json.dumps(True))
print(json.dumps(False))
print(json.dumps(None))
```

```
{"name": "John", "age": 30}
["apple", "bananas"]
["apple", "bananas"]
"hello"
42
31.76
true
false
null
```

Assignment:

Create `json_assignment.py` and solve the following:

Q1. Save Book Data

Create a dictionary for a book (title, author, year) and save it to `book.json`.

Q2. Load and Print Book

Read back the file and print the data neatly.

Q3. Create JSON from List

Convert this list to JSON and save it to a file:

```
students = [
    {"name": "Sita", "grade": "A"},
    {"name": "Ram", "grade": "B+"}
]
```

Q4. Update JSON File

Read `students.json`, add a new student, and save the updated list back.