22/9/25- time Module

The **time module** in Python is used to work with time-related tasks such as measuring execution time, handling delays, formatting dates, and getting system time.

4.1 time() – Current Time in Seconds

```
import time
print(time.time())
```

Output (example):

```
1726551782.58463
```

🔎 **Theory**

- Returns the **current time in seconds** since **Epoch** (Jan 1, 1970, 00:00:00 UTC).
- Useful for performance measurement and timestamps.

4.2 ctime() – Readable Time

```
import time
print(time.ctime())
```

Output (example):

```
Tue Sep 17 10:43:02 2025
```

🔎 **Theory**

- Converts the current system time into a **human-readable string**.
- Format: "Day Month Date HH:MM:SS Year".

4.3 sleep() – Delay Execution

```
import time
print("Start")
time.sleep(3)
```

```
print("End after 3 seconds")
```

Output:

```
Start
(3-second pause)
End after 3 seconds
```

🔎 **Theory**

- time.sleep(n) pauses the program for **n seconds**.
- Useful in simulations, animations, or slowing down loops.

4.4 localtime() – Local Time as Struct

```
import time
print(time.localtime())
```

Output (example):

```
time.struct_time(tm_year=2025, tm_mon=9, tm_mday=17,
                 tm_hour=10, tm_min=43, tm_sec=2,
                 tm_wday=1, tm_yday=260, tm_isdst=0)
```

🔎 **Theory**

- Returns current local time as a **struct_time object** (like a tuple).
- Contains year, month, day, hour, minute, second, weekday, etc.

4.5 strftime() – Format Date and Time

```
import time
now = time.localtime()
print(time.strftime("%Y-%m-%d %H:%M:%S", now))
```

Output (example):

```
2025-09-17 10:43:02
```

🔎 **Theory**

- strftime(format, struct_time) formats time into a **custom string**.
- Common format codes:
    - %Y = Year (2025)
    - %m = Month (09)
    - %d = Day (17)
    - %H = Hour (24-hr)
    - %M = Minute
    - %S = Second

4.6 gmtime() – UTC Time

```
import time
print(time.gmtime())
```

Output (example):

```
time.struct_time(tm_year=2025, tm_mon=9, tm_mday=17,
                 tm_hour=5, tm_min=13, tm_sec=2,
                 tm_wday=1, tm_yday=260, tm_isdst=0)
```

🔎 **Theory**

- Returns **UTC (Coordinated Universal Time)** instead of local time.