**Python** ``\*\* Module - All Useful Methods Explained in Layman Terms\*\*

### 🔧 1. File and Directory Path Handling Methods

**os.getcwd()** – Get current working directory.  
🔹 **Use**: Shows where the Python script is running from.  
🔹 **Examples**:

print(os.getcwd()) # Shows current directory  
cwd = os.getcwd() # Store current path  
if 'Desktop' in os.getcwd(): print("On Desktop")

**os.chdir(path)** – Change the current working directory.  
🔹 **Use**: Move into another folder.  
🔹 **Examples**:

os.chdir("C:/Users/YourName/Desktop")  
os.chdir("myfolder")  
os.chdir("..") # Move one step back

**os.listdir(path=‘.’)** – List files and folders in the directory.  
🔹 **Use**: Lists everything inside a folder.  
🔹 **Examples**:

print(os.listdir())  
print(os.listdir("C:/Users/YourName/Desktop"))  
if 'notes.txt' in os.listdir(): print("Found it!")

**os.mkdir(path)** – Create a single folder.  
🔹 **Use**: Makes a new folder.  
🔹 **Examples**:

os.mkdir("new\_folder")  
if not os.path.exists("backup"): os.mkdir("backup")  
os.mkdir("folder/sub") # Will error if 'folder' doesn't exist

**os.makedirs(path)** – Create multiple nested folders.  
🔹 **Use**: Makes folders and subfolders in one go.  
🔹 **Examples**:

os.makedirs("main/notes")  
os.makedirs("a/b/c", exist\_ok=True)  
if not os.path.exists("data/logs"): os.makedirs("data/logs")

**os.remove(path)** – Delete a file.  
🔹 **Use**: Removes a file permanently.  
🔹 **Examples**:

os.remove("old.txt")  
if os.path.exists("temp.txt"): os.remove("temp.txt")  
try: os.remove("file.csv")  
except: print("Not found")

**os.rmdir(path)** – Delete an empty folder.  
🔹 **Use**: Deletes a folder if it’s empty.  
🔹 **Examples**:

os.rmdir("oldfolder")  
if os.path.exists("logs"): os.rmdir("logs")  
try: os.rmdir("project")  
except: print("Folder not empty")

**os.removedirs(path)** – Delete nested empty folders.  
🔹 **Use**: Deletes all empty folders in the path.  
🔹 **Examples**:

os.makedirs("x/y/z")  
os.removedirs("x/y/z")  
os.removedirs("temp/data")

**os.rename(old, new)** – Rename a file or folder.  
🔹 **Use**: Renames the file or folder.  
🔹 **Examples**:

os.rename("draft.txt", "final.txt")  
os.rename("temp", "backup")  
if os.path.exists("report.txt"): os.rename("report.txt", "2024\_report.txt")

**os.path.exists(path)** – Check if path exists.  
🔹 **Use**: Checks if file or folder is present.  
🔹 **Examples**:

print(os.path.exists("test.txt"))  
if not os.path.exists("backup"): os.mkdir("backup")  
print("Exists" if os.path.exists("folder") else "Missing")

**os.path.isdir(path)** – Check if path is a folder.  
**os.path.isfile(path)** – Check if path is a file.  
🔹 **Examples**:

print(os.path.isdir("docs"))  
print(os.path.isfile("readme.md"))  
if os.path.isdir("images"): print("It's a folder")

**os.path.join(path1, path2, …)** – Join multiple paths correctly.  
🔹 **Use**: Combines path parts into a full path.  
🔹 **Examples**:

os.path.join("folder", "file.txt")  
os.path.join("C:/Users", "makam", "Desktop")  
os.path.join("data", "2024", "report.txt")

**os.path.basename(path)** – Get the file name from a path.  
🔹 **Examples**:

os.path.basename("C:/folder/file.txt") # 'file.txt'

**os.path.dirname(path)** – Get the folder name from a path.  
🔹 **Examples**:

os.path.dirname("C:/folder/file.txt") # 'C:/folder'

**os.path.abspath(path)** – Get absolute version of a path.  
🔹 **Examples**:

os.path.abspath("file.txt") # Full path to file

### 🌍 2. Environment Variable Methods

**os.environ** – Dictionary of system environment variables.  
**os.getenv(key)** – Get a specific environment variable.  
**os.putenv(key, value)** – Set an environment variable.  
🔹 **Examples**:

print(os.environ['USERNAME'])  
print(os.getenv('PATH'))  
os.putenv('TEST\_ENV', '123')

### ⚙️ 3. Process and System Info Methods

**os.system(command)** – Run a shell command.  
**os.getpid()** – Get current process ID.  
**os.getppid()** – Get parent process ID.  
**os.\_exit(code)** – Exit the process immediately.  
**os.name** – OS type (‘nt’, ‘posix’).  
**os.cpu\_count()** – Number of CPU cores.  
**os.getlogin()** – Logged-in user name. 🔹 **Examples**:

os.system("echo Hello World")  
print(os.getpid())  
print(os.cpu\_count())

### ⏳ 4. Time-Related Methods

**os.times()** – Get user/system CPU times. 🔹 **Example**:

print(os.times())

### ✨ 5. Miscellaneous Methods

**os.startfile(path)** – Open file with default program (Windows only).  
**os.stat(path)** – Get file metadata.  
**os.walk(top)** – Walk through directory tree. 🔹 **Examples**:

os.startfile("file.txt")  
print(os.stat("file.txt"))  
for root, dirs, files in os.walk("."):  
 print(root, dirs, files)

### 📅 Example Use Cases

* Organize and manage folders/files.
* Rename files based on content.
* Automate backups and cleanups.
* Access system-level configurations.
* Use correct paths across different operating systems.