

# Python & PyOpenGL Installation Guide (Windows)

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## Step 1: Install Python

1. Download Python from the official website:  
<https://www.python.org/downloads/>
2. Install Python (any version). During installation:
  - Check 'Add Python to PATH' (recommended).
  - Complete the installation.

## Step 2: Verify Python Installation

1. Open Command Prompt (CMD) or PowerShell.

2. Run the following command:

```
python --version
```

- If Python is installed correctly, it will show something like: Python 3.12.5
- If you get an error (Python not found), continue to the next step.

## Step 3: Check Python Path

1. In CMD, run:

```
where python
```

- If Python is installed correctly, this should show a path like:  
*C:\Users\LENOVO\AppData\Local\Programs\Python\Python312\python.exe*
- If nothing shows, Python is not added to PATH.

## Step 4: Fix PATH Issue

1. Find your Python installation folder. Usually it is in:

*C:\Users\LENOVO\AppData\Local\Programs\Python\Python3xx\*  
(where 3xx = version like 312).

2. Copy that folder path.
3. Go to: - **Settings** → **System** → **About** → **Advanced system settings** → **Environment Variables**.

- Under System variables, select **Path** → **Edit**.
- Add these two paths (adjust version number):

*C:\Users\LENOVO\AppData\Local\Programs\Python\Python312\  
C:\Users\LENOVO\AppData\Local\Programs\Python\Python312\Scripts\*

4. Save and restart your terminal.

## Step 5: Disable Microsoft Store Alias (if still not working)

1. Open: Settings → Apps → Advanced app settings → App execution aliases.
2. Turn OFF the switches for:
  - python.exe
  - python3.exe

This prevents Windows from redirecting to Microsoft Store.

## Step 6: Verify Installation

Reopen CMD or PowerShell and run:

```
python --version
```

It should now show something like:

*Python 3.12.5*

👉 If you already installed multiple versions of Python, remove all except one (preferably the latest version).

## Step 7: Download PyOpenGL

1. Open this GitHub repository:  
<https://github.com/cgohlke/pyopengl-build/releases>
2. Download the following files based on your system:

- *PyOpenGL-3.X.X-cp3XX-cp3XX-win\_amd64.whl*
  - *PyOpenGL\_accelerate-3.X.X-cp3XX-cp3XX-win\_amd64.whl*
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- *PyOpenGL-3.X.X-cp3XX-cp3XX-win\_amr64.whl*
  - *PyOpenGL\_accelerate-3.X.X-cp3XX-cp3XX-win\_amr64.whl*

(Note: 3XX = Python version, e.g., for Python 3.12 → cp312)

3. Save both .whl files in a specific folder.

## Step 8: Install PyOpenGL

1. Open CMD or PowerShell in the folder where you saved the .whl files.
2. Run the following commands (adjust filenames to match your downloaded version):

```
pip install PyOpenGL-3.X.X-cp3XX-cp3XX-win_amd64.whl  
pip install PyOpenGL_accelerate-3.X.X-cp3XX-cp3XX-win_amd64.whl
```

3. Wait until installation completes.

## Step 9: Verify Installation

Run Python and try importing PyOpenGL:

```
from OpenGL.GL import *  
from OpenGL.GLU import *  
from OpenGL.GLU import *  
  
def show():  
    glClear(GL_COLOR_BUFFER_BIT) # Clear window  
    glLoadIdentity() # Reset transformations  
    glOrtho(0, 500, 0, 500, -1, 1)  
  
    #drawing traingle.  
    glColor3f(0,0,1)  
    glBegin(GL_POLYGON)  
    for v in [(0,0),(250,0),(250,250)]:  
        glVertex2f(*v)  
    glEnd()  
  
    glutSwapBuffers() # Refresh window  
  
# Main setup  
glutInit()  
glutInitDisplayMode(GLUT_RGBA | GLUT_DOUBLE)  
glutInitWindowSize(500, 500) # Window size  
glutCreateWindow(b"Simple OpenGL Window") # Window title  
#glClearColor(0.2, 0.6, 1.0, 1.0) # RGBA (Red, Green, Blue, Alpha)  
glutDisplayFunc(show) # What to display  
glutMainLoop() # Keep window open
```

If no error appears, installation is complete ✅