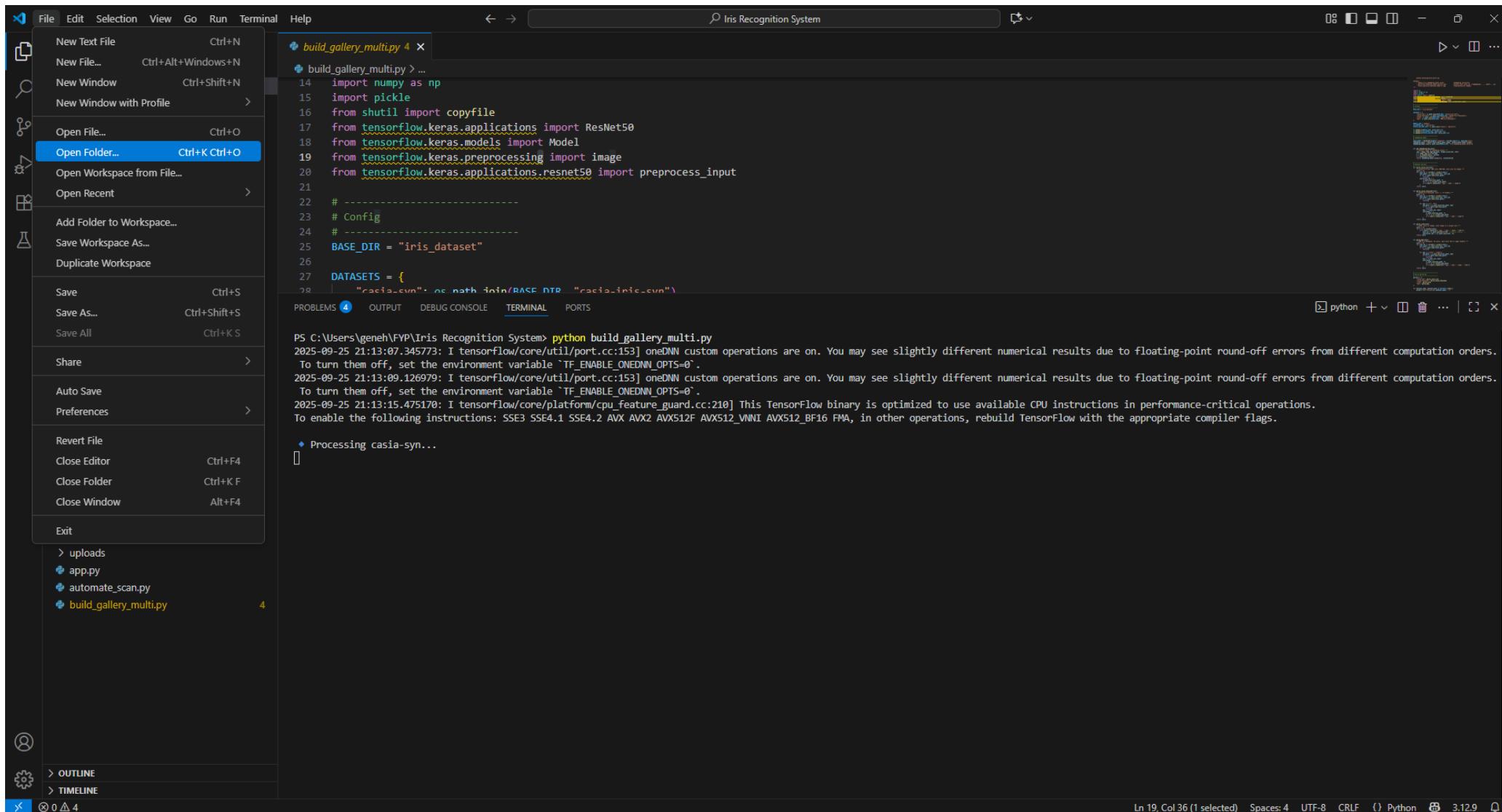


Iris Recognition System for Library User Manual

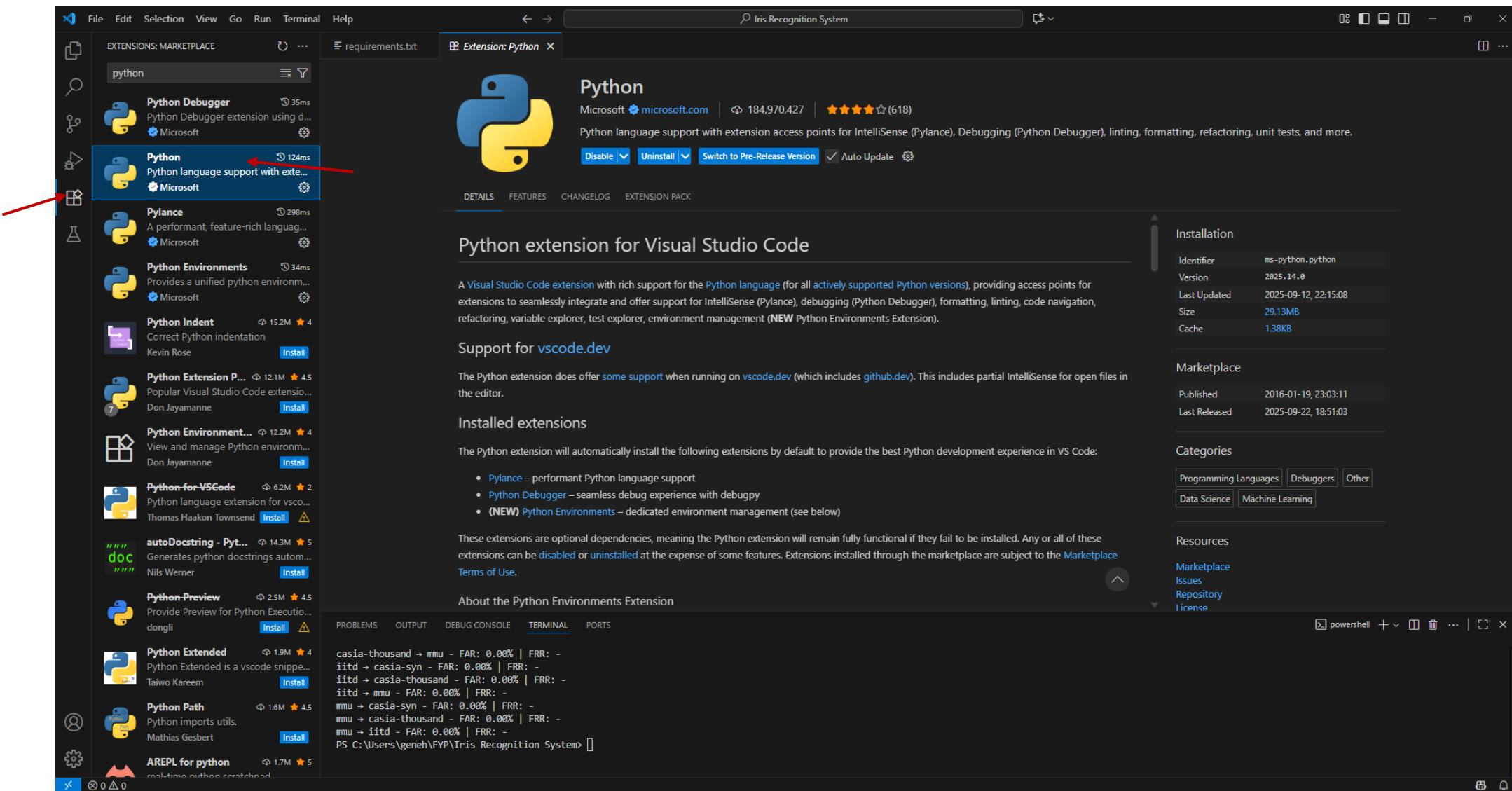
Step 1: Open Visual Studio Code and open the system folder



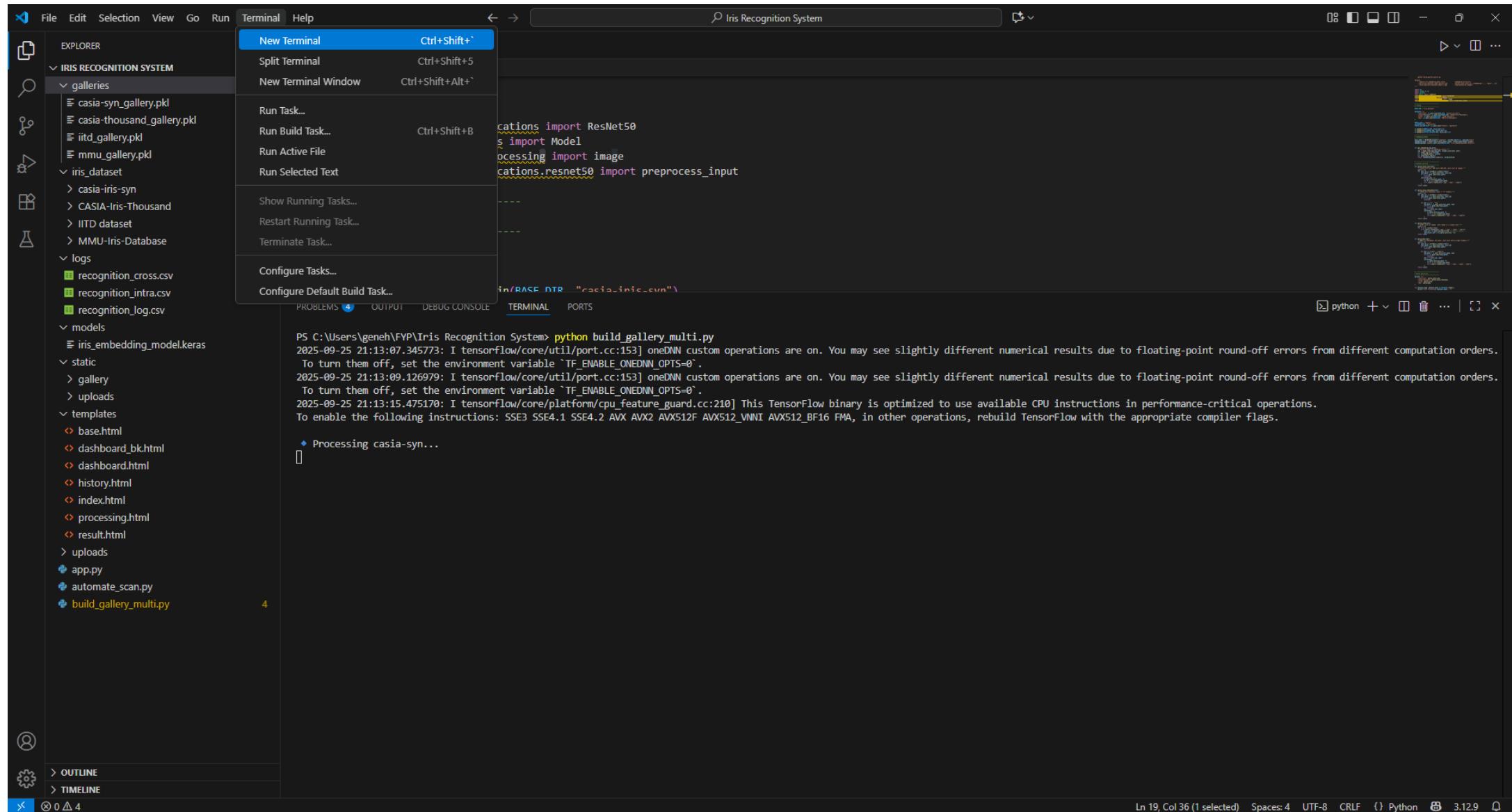
The screenshot shows the Visual Studio Code interface with the following details:

- File Menu:** The "File" menu is open, showing options like "New Text File", "Open Folder...", and "Open Workspace from File...". The "Open Folder..." option is highlighted with a blue selection bar.
- Editor:** A Python script named "build_gallery_multi.py" is open in the editor. The code imports numpy, pickle, and various TensorFlow modules, and defines a "DATASETS" dictionary.
- Terminal:** The terminal tab is active, showing command-line output for running the script with Python. It includes several informational messages about TensorFlow's computation orders and optimizations.
- Status Bar:** The status bar at the bottom right shows "Ln 19, Col 36 (1 selected) Spaces: 4 UTF-8 CRLF {} Python 3.12.9".

Step 2: In VS Code marketplace search for Python and download it



Step 3: Go to Terminal and click new terminal



The screenshot shows the Visual Studio Code interface with the 'Terminal' menu open. The 'New Terminal' option is highlighted. The terminal window displays Python code for building a gallery and logs from the command line.

```
cations import ResNet50
s import Model
ocessing import image
cations.resnet50 import preprocess_input

in(RASE DTR "casia-inic-syn")
```

```
PS C:\Users\geneh\FYP\Iris Recognition System> python build_gallery_multi.py
2025-09-25 21:13:07.345773: I tensorflow/core/util/port.cc:153] oneDNN custom operations are on. You may see slightly different numerical results due to floating-point round-off errors from different computation orders.
To turn them off, set the environment variable 'TF_ENABLE_ONEDNN_OPTS=0'.
2025-09-25 21:13:09.126979: I tensorflow/core/util/port.cc:153] oneDNN custom operations are on. You may see slightly different numerical results due to floating-point round-off errors from different computation orders.
To turn them off, set the environment variable 'TF_ENABLE_ONEDNN_OPTS=0'.
2025-09-25 21:13:15.475170: I tensorflow/core/platform/cpu_feature_guard.cc:210] This TensorFlow binary is optimized to use available CPU instructions in performance-critical operations.
To enable the following instructions: SSE3 SSE4.1 SSE4.2 AVX AVX2 AVX512F AVX512_VNNI AVX512_BF16 FMA, in other operations, rebuild TensorFlow with the appropriate compiler flags.

    Processing casia-syn...
```

At the bottom, the status bar shows: Ln 19, Col 36 (1 selected) Spaces: 4 UTF-8 CRLF () Python 3.12.9

Step 4: Type “pip install -r requirements.txt” in the terminal

```
PS C:\Users\geneh\FYP\Iris Recognition System> pip install -r requirements.txt
Collecting flask==3.0.3 (from -r requirements.txt (line 1))
  Using cached flask-3.0.3-py3-none-any.whl.metadata (3.2 kB)
Collecting tensorflow==2.16.1 (from -r requirements.txt (line 2))
  Using cached tensorflow-2.16.1-cp312-cp312-win_amd64.whl.metadata (3.5 kB)
Collecting scikit-learn==1.3.2 (from -r requirements.txt (line 3))
  Downloading scikit_learn-1.3.2-cp312-cp312-win_amd64.whl.metadata (11 kB)
Collecting numpy==1.26.4 (from -r requirements.txt (line 4))
  Using cached numpy-1.26.4-cp312-cp312-win_amd64.whl.metadata (61 kB)
Collecting pandas==2.1.4 (from -r requirements.txt (line 5))
  Downloading pandas-2.1.4-cp312-cp312-win_amd64.whl.metadata (18 kB)
Collecting matplotlib==3.8.2 (from -r requirements.txt (line 6))
  Downloading matplotlib-3.8.2-cp312-cp312-win_amd64.whl.metadata (5.9 kB)
Collecting pillow==10.4.0 (from -r requirements.txt (line 7))
  Using cached pillow-10.4.0-cp312-cp312-win_amd64.whl.metadata (9.3 kB)
Requirement already satisfied: Werkzeug>=3.0.0 in c:\users\geneh\appdata\local\programs\python\python312\lib\site-packages (from flask==3.0.3->-r requirements.txt (line 1)) (3.1.3)
Requirement already satisfied: Jinja2>=3.1.2 in c:\users\geneh\appdata\local\programs\python\python312\lib\site-packages (from flask==3.0.3->-r requirements.txt (line 1)) (3.1.6)
Requirement already satisfied: itsdangerous>=2.1.2 in c:\users\geneh\appdata\local\programs\python\python312\lib\site-packages (from flask==3.0.3->-r requirements.txt (line 1)) (2.2.0)
Requirement already satisfied: click>=8.1.3 in c:\users\geneh\appdata\local\programs\python\python312\lib\site-packages (from flask==3.0.3->-r requirements.txt (line 1)) (8.1.8)
Requirement already satisfied: blinker>=1.6.2 in c:\users\geneh\appdata\local\programs\python\python312\lib\site-packages (from flask==3.0.3->-r requirements.txt (line 1)) (1.9.0)
Collecting tensorflow-intel==2.16.1 (from tensorflow==2.16.1->-r requirements.txt (line 2))
  Using cached tensorflow_intel-2.16.1-cp312-cp312-win_amd64.whl.metadata (5.0 kB)
Requirement already satisfied: scipy>=1.5.0 in c:\users\geneh\appdata\local\programs\python\python312\lib\site-packages (from scikit-learn==1.3.2->-r requirements.txt (line 3)) (1.15.2)
```

Step 5: In the terminal, type “python build_gallery_multi.py”. Then, wait until the progress is done as shown below

```
PS C:\Users\geneh\FYP\Iris Recognition System> python build_gallery_multi.py
2025-09-25 21:13:07.345773: I tensorflow/core/util/port.cc:153] oneDNN custom operations are on. You may see slightly different numerical results due to floating-point round-off errors from different computation orders.
To turn them off, set the environment variable `TF_ENABLE_ONEDNN_OPTS=0`.
2025-09-25 21:13:09.126979: I tensorflow/core/util/port.cc:153] oneDNN custom operations are on. You may see slightly different numerical results due to floating-point round-off errors from different computation orders.
To turn them off, set the environment variable `TF_ENABLE_ONEDNN_OPTS=0`.
2025-09-25 21:13:15.475170: I tensorflow/core/platform/cpu_feature_guard.cc:210] This TensorFlow binary is optimized to use available CPU instructions in performance-critical operations.
To enable the following instructions: SSE3 SSE4.1 SSE4.2 AVX AVX2 AVX512F AVX512_VNNI AVX512_BF16 FMA, in other operations, rebuild TensorFlow with the appropriate compiler flags.

◆ Processing casia-syn...
✓ casia-syn: 500 users processed. Saved galleries\casia-syn_gallery.pkl

◆ Processing casia-thousand...
✓ casia-thousand: 1000 users processed. Saved galleries\casia-thousand_gallery.pkl

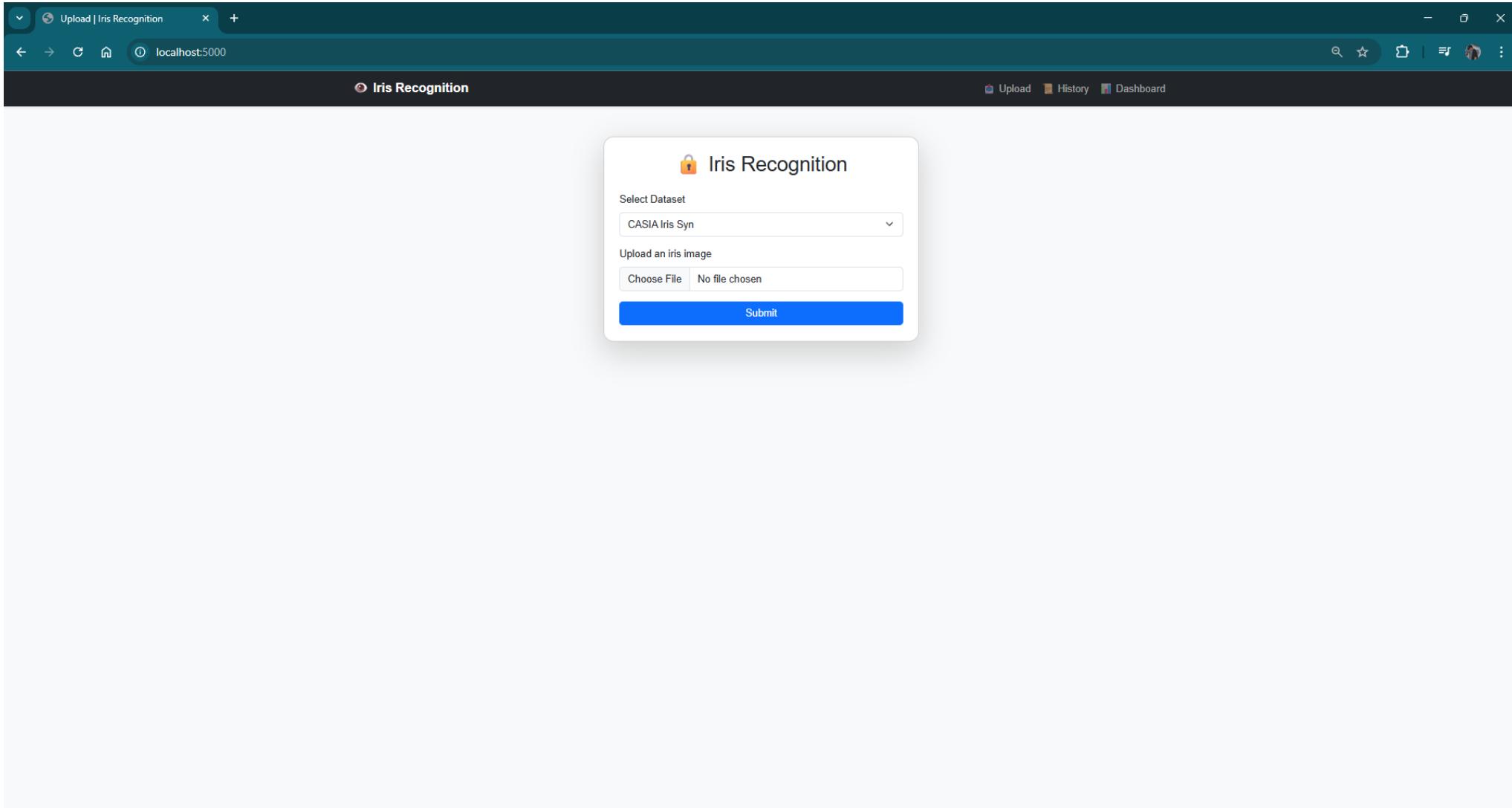
◆ Processing iitd...
✓ iitd: 12 users processed. Saved galleries\iitd_gallery.pkl

◆ Processing mmu...
✓ mmu: 90 users processed. Saved galleries\mmu_gallery.pkl
PS C:\Users\geneh\FYP\Iris Recognition System>
```

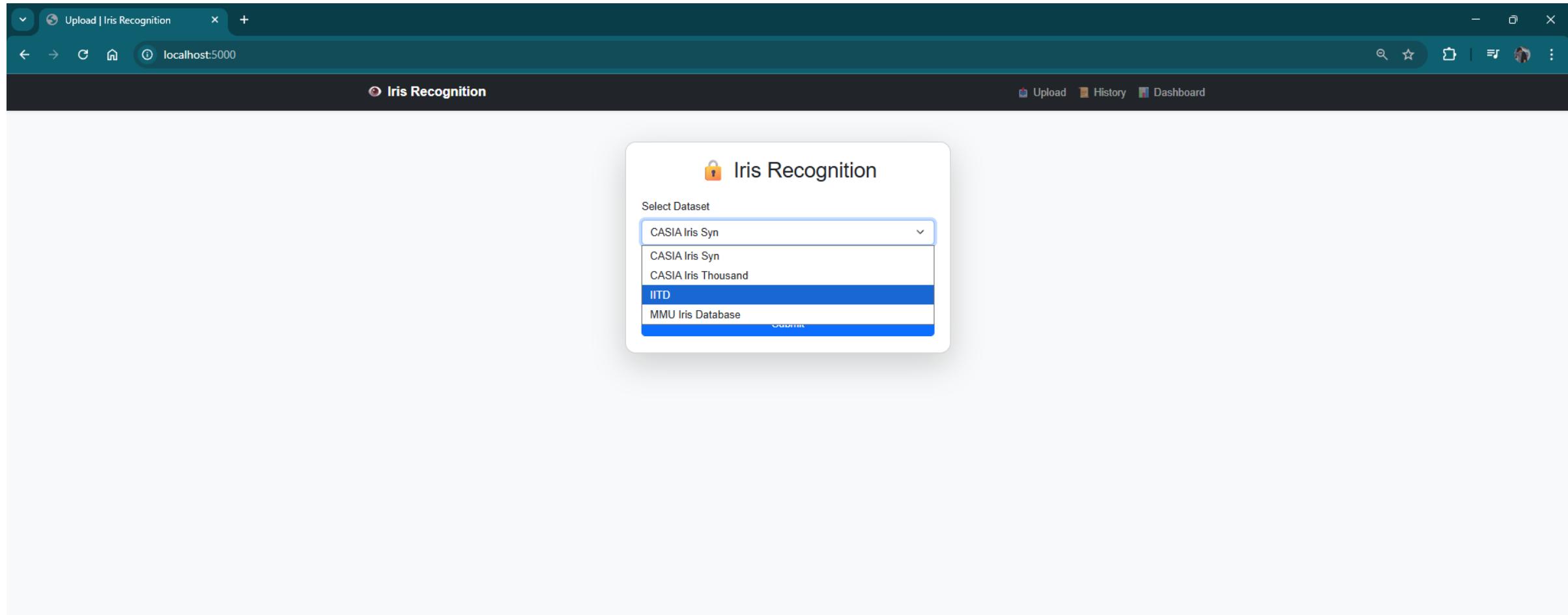
Step 6: In the terminal, type “app.py”

```
PS C:\Users\geneh\FYP\Iris Recognition System> python app.py
2025-09-25 21:35:17.928213: I tensorflow/core/util/port.cc:153] oneDNN custom operations are on. You may see slightly different numerical results due to floating-point round-off errors from different computation orders.
To turn them off, set the environment variable `TF_ENABLE_ONEDNN_OPTS=0`.
2025-09-25 21:35:18.759815: I tensorflow/core/util/port.cc:153] oneDNN custom operations are on. You may see slightly different numerical results due to floating-point round-off errors from different computation orders.
To turn them off, set the environment variable `TF_ENABLE_ONEDNN_OPTS=0`.
2025-09-25 21:35:21.953029: I tensorflow/core/platform/cpu_feature_guard.cc:210] This TensorFlow binary is optimized to use available CPU instructions in performance-critical operations.
To enable the following instructions: SSE3 SSE4.1 SSE4.2 AVX AVX2 AVX512F AVX512_VNNI AVX512_BF16 FMA, in other operations, rebuild TensorFlow with the appropriate compiler flags.
* Serving Flask app 'app'
* Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on http://127.0.0.1:5000
Press CTRL+C to quit
* Restarting with stat
* Debugger is active!
* Debugger PIN: 585-708-882
```

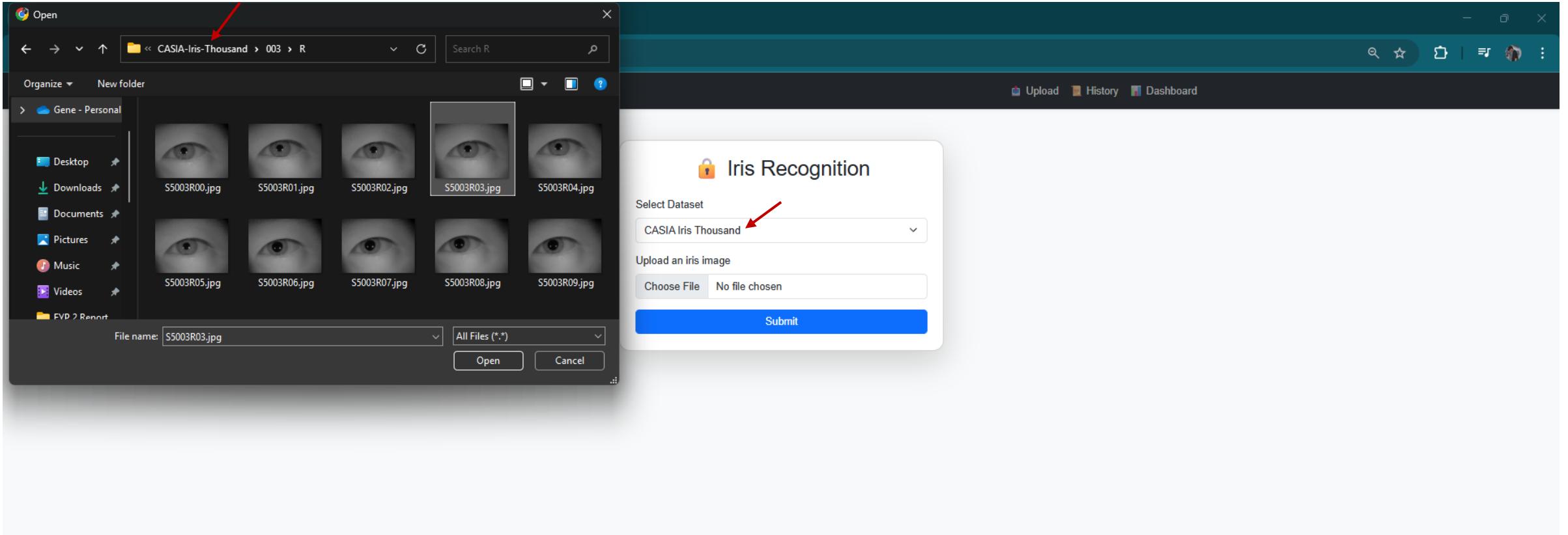
Step 7: Go to web browser and type
“<http://localhost:5000/>”



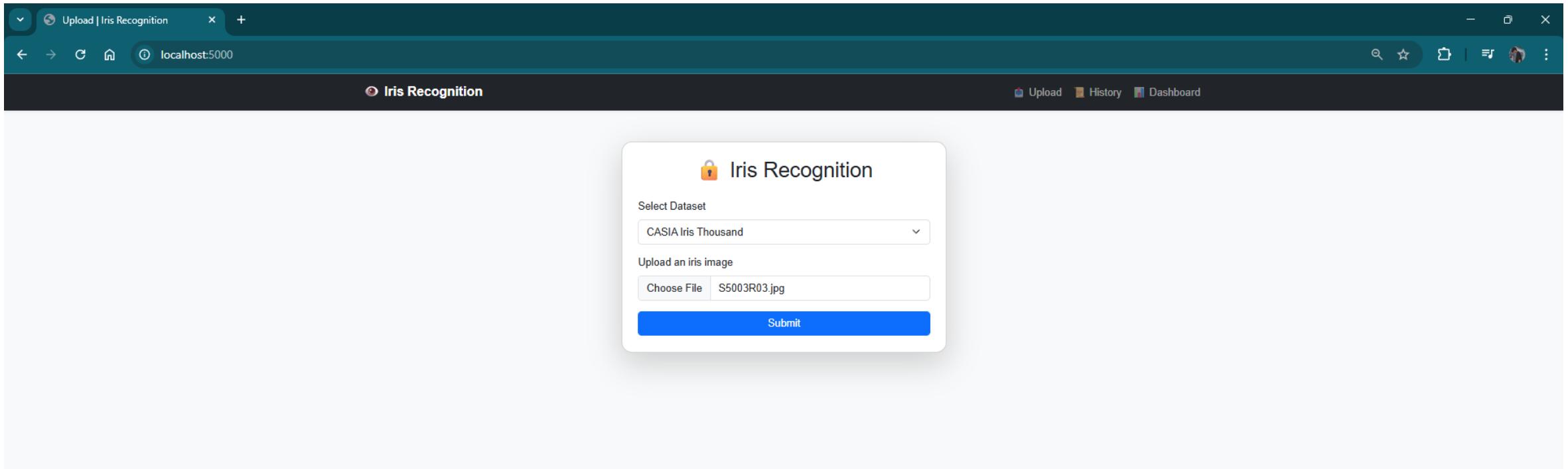
Step 8: Select the dataset that you want to scan in the drop-down menu



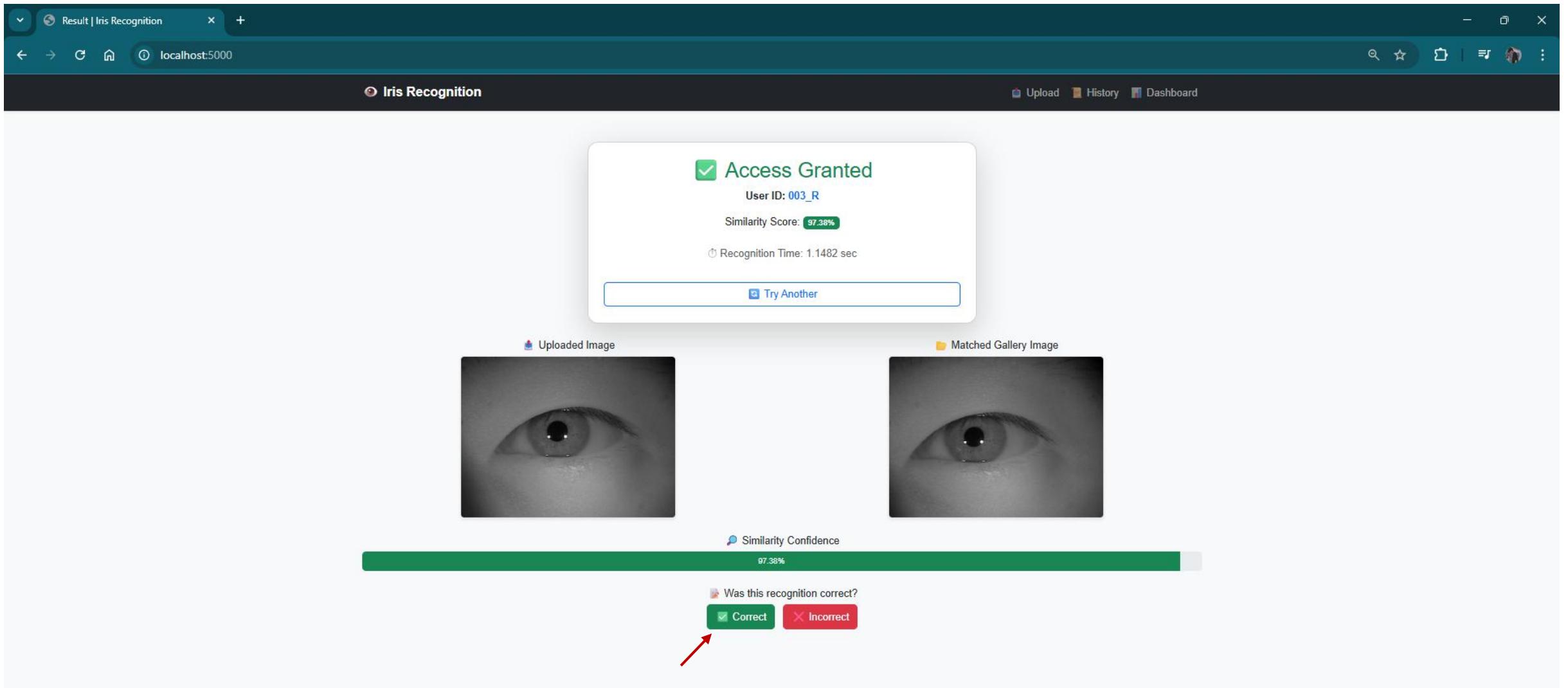
Step 9: Upload an iris image from the selected database



Step 10: Click Submit



Step 11: Check whether the recognized image is correct or incorrect. Then, provide the feedback below



Step 12: You may view the dashboard for all datasets or a specific dataset, then click filter

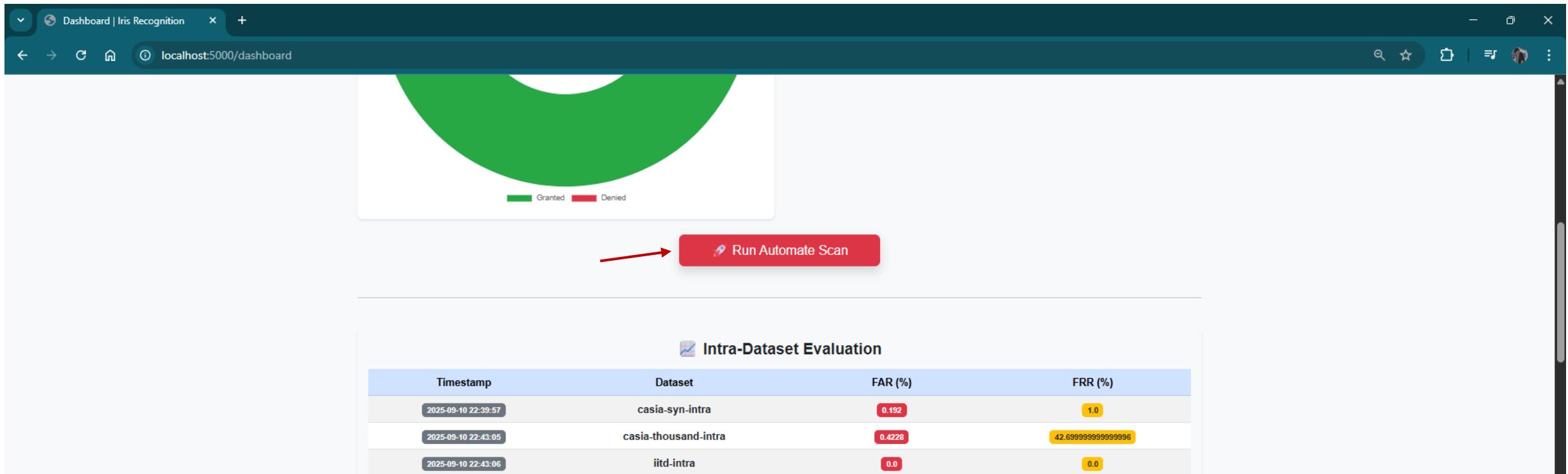
The screenshot shows the Iris Recognition Dashboard interface. At the top left, there is a dropdown menu labeled "All Datasets" which is currently set to "All Datasets". To the right of the dropdown is a search bar with the placeholder text "Filter". A red arrow points to the "All Datasets" dropdown, and another red arrow points to the "Filter" search bar.

The dashboard features several data visualizations:

- A large blue header box with the title "Iris Recognition Dashboard" and the subtitle "Monitor recognition performance across datasets".
- A "Avg Recognition Time" metric displayed as 0.461s.
- Four cards below the metric showing user counts: Casia-syn (90 Users), Casia-thousand (52 Users), iitd (16 Users), and Mmu (16 Users).
- A donut chart titled "Access Results" showing the distribution of access.
- A bar chart titled "Top Recognized Users" showing the number of recognitions for five users: 0, 1.0, 005, 008, and 003_R.

A green notification bar at the top of the page indicates that "Feedback saved successfully!"

Step 13a: There are two ways to run automate scan to get the intra-dataset and cross-dataset results. First is clicking the run automate scan button in the dashboard page shown below



Step 13b: Second is running it offline in VS Code by typing “python automate_scan.py” in the terminal

```
PS C:\Users\geneh\FYP\Iris Recognition System> python automate_scan.py
2025-09-25 21:48:30.652355: I tensorflow/core/util/port.cc:153] oneDNN custom operations are on. You may see slightly different numerical results due to floating-point round-off errors from different computation orders.
To turn them off, set the environment variable `TF_ENABLE_ONEDNN_OPTS=0`.
2025-09-25 21:48:31.348833: I tensorflow/core/util/port.cc:153] oneDNN custom operations are on. You may see slightly different numerical results due to floating-point round-off errors from different computation orders.
To turn them off, set the environment variable `TF_ENABLE_ONEDNN_OPTS=0`.
2025-09-25 21:48:34.230588: I tensorflow/core/platform/cpu_feature_guard.cc:210] This TensorFlow binary is optimized to use available CPU instructions in performance-critical operations.
To enable the following instructions: SSE3 SSE4.1 SSE4.2 AVX AVX2 AVX512F AVX512_VNNI AVX512_BF16 FMA, in other operations, rebuild TensorFlow with the appropriate compiler flags.
Processing dataset: casia-syn
1/1 ━━━━━━ 1s 965ms/step
1/1 ━━━━ 0s 46ms/step
1/1 ━━━━ 0s 47ms/step
1/1 ━━━━ 0s 46ms/step
1/1 ━━━━ 0s 46ms/step
1/1 ━━━━ 0s 44ms/step
1/1 ━━━━ 0s 43ms/step
1/1 ━━━━ 0s 43ms/step
1/1 ━━━━ 0s 45ms/step
```