Proof of Concept Report

Homograph-based Short Link Redirection PoC

1. Objective

This PoC demonstrates how homograph attacks can be simulated using a local short-link redirection tool. It visually replaces letters in a legitimate domain with Unicode look-alikes to make phishing links appear genuine.

2. Technical Overview

Language: Python 3

Libraries Used:

- Tkinter – GUI for user interaction
- Flask – Local web server for redirecting links
- pyperclip – Clipboard management
- random, string – Token generation

Homograph Mapping:

'a' → ['a', 'ɑ']

'o' → ['o', 'ο']

'l' → [' ǀ ', 'I']

Workflow:

1. Input a long URL.
2. Select or enter a target domain.
3. Replace characters with Unicode look-alikes.
4. Generate a fake preview link & a local redirect link.
5. Store mapping in Flask backend.
6. Clicking link redirects locally to original URL.

3. PoC Execution Steps

Step 1 — Setup:

pip install flask pyperclip

python homograph_poc.py

Step 2 — Input Long URL:

Example: https://www.youtube.com

Step 3 — Choose Domain:

Select from dropdown (e.g., google.com) or enter a custom one.

Step 4 — Generate Short Link:

Click 'Generate Short Link' → The tool creates:

- Preview Link: Homograph altered (e.g., http://google.com/x9A3dQ)

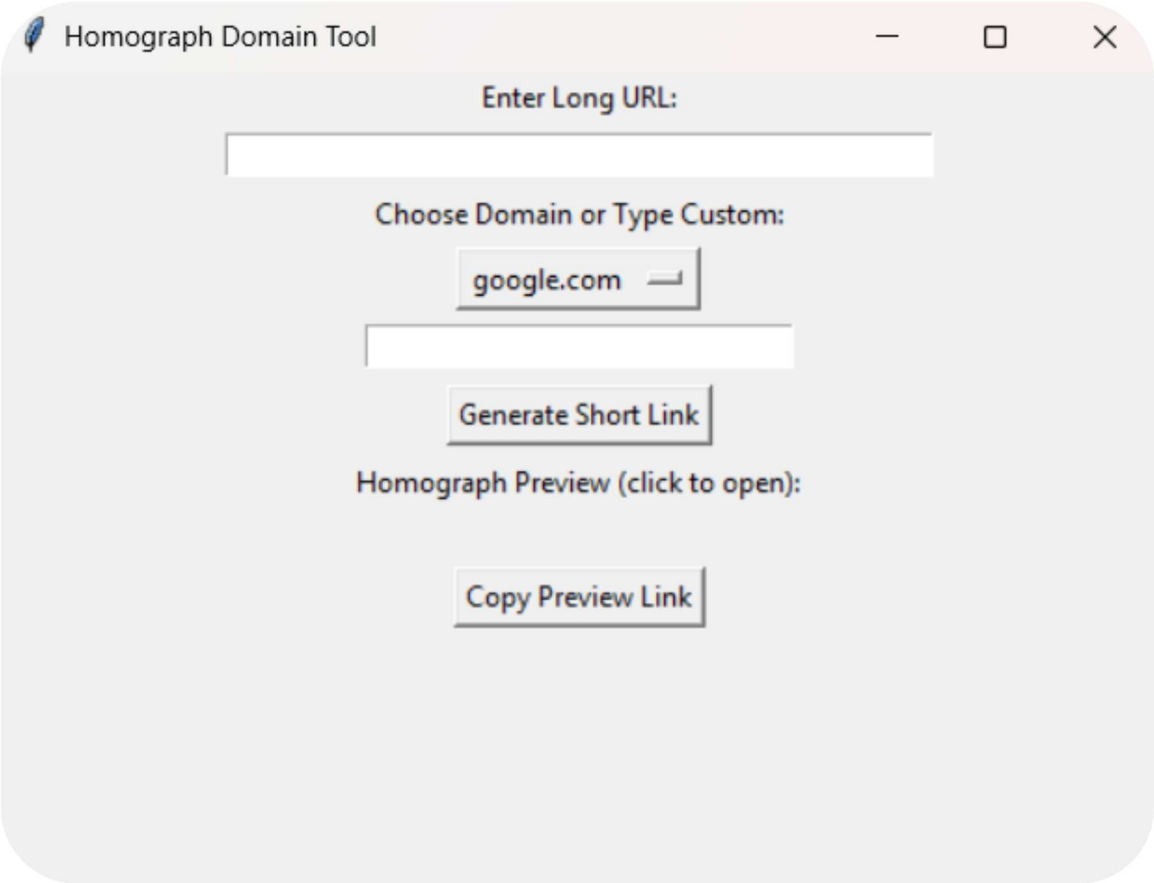
- Local Link: Redirects via 127.0.0.1:5000

Step 5 — Test Redirect:
Click the preview link → Browser opens local Flask redirect → Sends you to original URL.

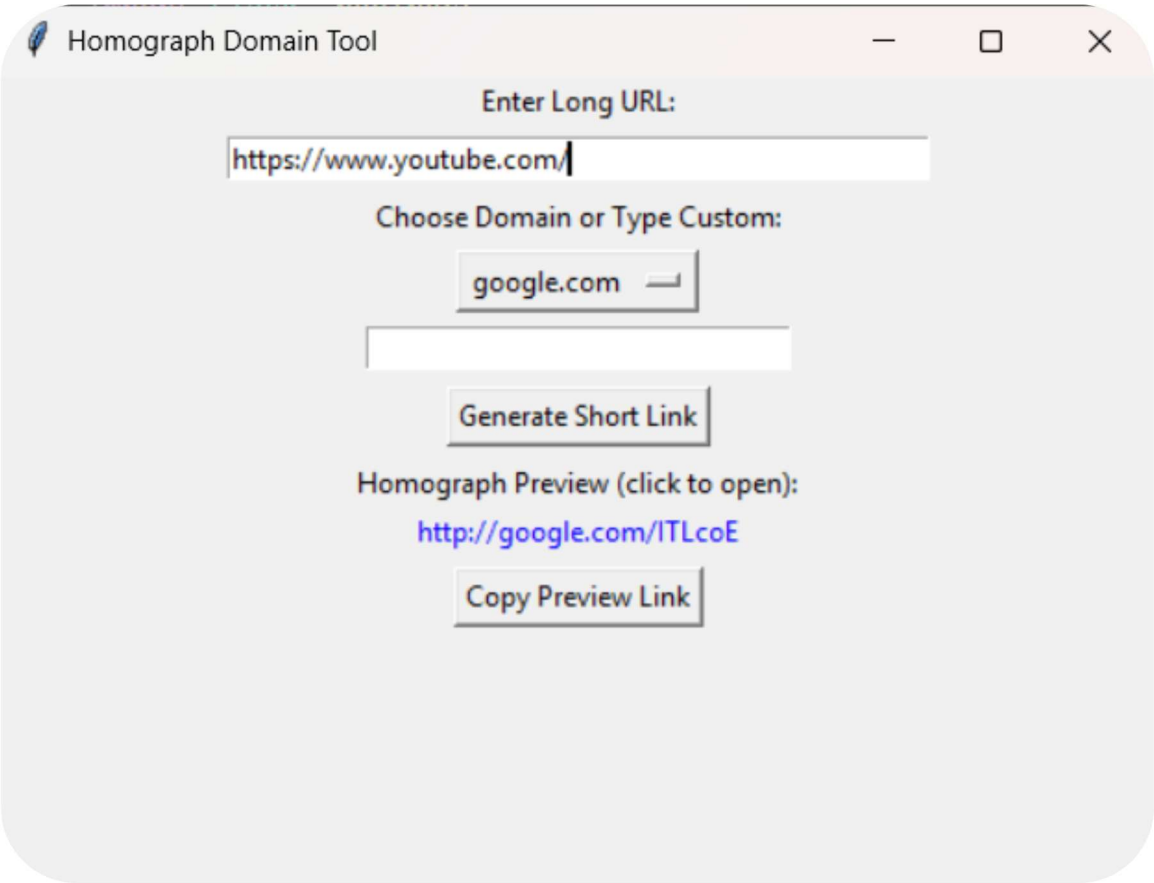
Step 6 — Copy Link:
Click 'Copy Preview Link' to copy the Unicode-altered domain to your clipboard.

4. Screenshot Placeholders

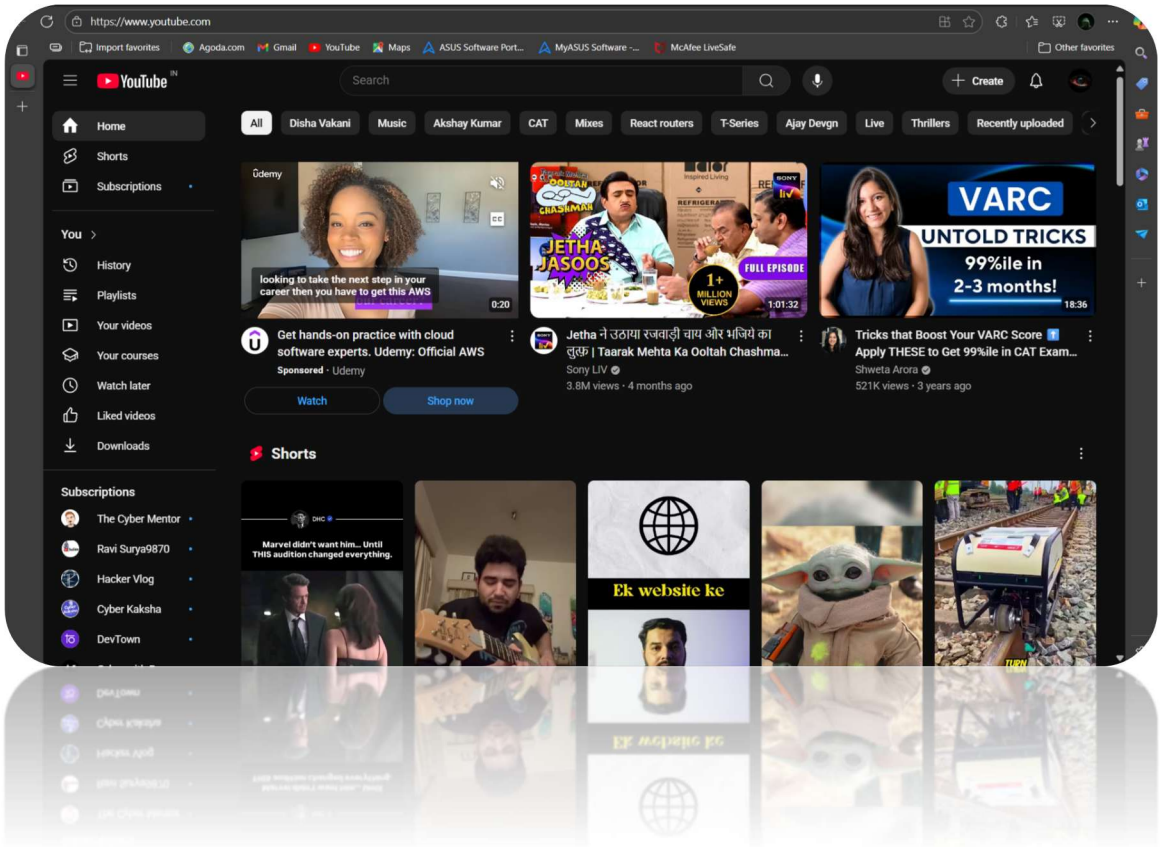
1. Tool Interface on Launch:



2. After Generating a Link:



3. Browser Redirect via Local Flask Server:



5. Conclusion

This PoC successfully demonstrates how homograph attacks can be simulated in a safe environment using Python's Tkinter + Flask. The generated fake-looking links highlight the potential for phishing campaigns and underscore the importance of user awareness & domain inspection before clicking links.