

Proof of Concept (PoC)

(made under Digisuraksha Parhari Foundation)

This PoC focuses on a CLI-based Python tool named **Homolyph Link Generator Tool**, developed to generate homographic (look-alike) links that safely redirect to legitimate websites.

While the same technique can be abused for phishing attacks, here it is used purely for training, awareness, and safe practice in cyber security exercises.

A. Tool: Homomap

1. History:

The concept of homograph (homoglyph) attacks emerged in the early 2000s when researchers demonstrated that attackers could abuse Unicode characters that looked visually identical (e.g., Latin "o" and Cyrillic "o") to impersonate websites like paypal.com or google.com.

The **Homolyph Link Generator Tool** was developed in 2025 as a safe practice tool to create fake-looking domains that always redirect to legitimate, non-malicious targets — useful for phishing awareness training and security research.

2. Description:

The tool can generate **homographic (fake-looking) links** that still redirect to legitimate websites. This technique is often exploited in phishing attacks, where malicious links visually appear to be legitimate but lead to unsafe destinations.

In our case, this tool is made for **safe practice and awareness training** — the generated fake links will always redirect to safe, legitimate websites. The idea is similar to URL shorteners like *Bitly*, but with an emphasis on demonstrating **homoglyph substitution attacks**.

The tool has **two modes**:

1. **Single Mode** – Enter one legitimate link, the tool generates a fake homoglyph version and an HTML redirect file for it.
 2. **Batch Mode** – Provide a .txt file containing multiple legitimate links, and the tool generates homoglyph variants + redirect HTMLs for each link in the list.
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3. What Is This Tool About?

The tool is essentially a **safe homograph phishing simulator**. It mimics the visual deception technique but ensures:

- The generated links do not lead to malicious servers.
 - Redirection is instant to the real website.
 - It can be used internally by SOC teams, trainers, and educators to raise awareness.
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4. Key Characteristics / Features:

- Generates fake-looking homograph domains.
 - Redirects instantly to the legitimate site.
 - Supports Unicode and ASCII substitutions.
 - Allows manual fake link entry or auto-generation.
 - Outputs a clickable redirect HTML file (offline-safe).
 - Fully CLI-based, lightweight.
 - Dependency-minimal, works on any OS with Python 3.
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5. Types / Modules Available:

- **Single Link Mode** – Generate one fake link and redirect file.
 - **Batch Mode** – Multiple fake links from a TXT list.
 - **Custom Substitution Table** – User-defined homoglyph mapping.
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6. How Will This Tool Help?

- **Security Awareness** – Shows how subtle URL changes can trick users.
- **Red Team Exercises** – Test user vigilance with safe, harmless redirects.
- **Forensic Training** – Prepare analysts to spot domain spoofing in logs.
- **Detection Tool Testing** – Feed generated URLs into homograph detection tools.

7. Proof of Concept (PoC) Images (Planned):

Screenshot 1:

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.26100.4770]
(c) Microsoft Corporation. All rights reserved.

C:\Windows\ >cd "C:\Python\Python Programs"

C:\Python\Python Programs>python homomap.py

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1. Single link mode
2. Batch mode (from file)

[?] Choose option (1/2): 1
[+] Enter legitimate URL: https://www.youtube.com/
[+] Enter fake domain (leave blank to auto-generate): ok
[✓] Fake domain: ok
[✓] Redirect file created: redirect_ok.html
Open this HTML file in a browser to test redirection.
```

Screenshot 2:

```
Administrator: Command Prompt
C:\Python Programs>python homomap.py

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1. Single link mode
2. Batch mode (from file)

[?] Choose option (1/2): 2
[+] Enter path to file containing URLs: urls.txt
[+] Generated: www.y0utub3.c0m/ -> https://www.youtube.com/
    HTML File: redirect_www.y0_t_b3.c0m_.html
[+] Generated: www.f@c3b00k.c0m/ -> https://www.facebook.com/
    HTML File: redirect_www.f_c3b00k.c0m_.html
[+] Generated: www.p@yp@1.c0m/ -> https://www.paypal.com/
    HTML File: redirect_www.p_yp_1.c0m_.html
```

8. ✂ How to Set Up & Run

Requirements:

- Python 3.6+
- No external dependencies

a. Step: Run the Tool

python homomap.py

9. Usage Scenarios & Examples

- **Example 1: Awareness Training**
Generate a fake link y0utube.com that redirects to youtube.com.
 - **Example 2: Phishing Simulation (Safe)**
Create multiple fake banking links that all land on the real banking site.
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10. 15-Liner Summary

- Generates fake-looking homograph links

- Redirects to legitimate sites
 - CLI based and lightweight
 - No malicious payload
 - Supports ASCII + Unicode substitutions
 - Outputs offline HTML redirect file
 - Can be used for phishing awareness
 - Works cross-platform
 - Simple to set up
 - Can batch-process URLs
 - Fully open-source
 - Great for controlled testing
 - Useful for red & blue teams
 - Trains employees on phishing awareness
 - No internet dependency for redirect file
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11. Time to Use / Best Case Scenarios

- Corporate phishing awareness drills
 - Cybersecurity classroom training
 - Red team safe simulations
 - Testing anti-phishing detection systems
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12. When to Use During Investigation

- To demonstrate URL spoofing tactics in court/expert witness reports
 - To train new SOC hires on spotting dangerous links
 - To reproduce phishing cases without real risk
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13. Best Person to Use & Required Skills

Best User:

- Security Trainer
- Red Team Operator
- SOC Analyst

Skills Needed:

- Basic terminal usage
 - Understanding of URL spoofing tactics
 - Awareness of phishing risks
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14. Flaws / Suggestions to Improve

- Does not currently host redirects online (offline HTML only)
 - Limited substitution mapping (can be expanded)
 - No QR code generation for phishing simulation
 - No automatic fake domain suggestion list
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15. Good About the Tool

- Harmless and safe
- Works offline
- Easy to demonstrate
- Flexible input options
- Cross-platform support

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