**HashMapper:Text-Finterprinting-Systems**

**User Manual**

# 1. Introduction

Welcome to HashMapper — a text fingerprinting and visualization system.  
This user manual will guide you through the setup, usage, and exploration of the application.  
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# 2. System Requirements

- Python 3.8 or newer  
- Java 8 or newer  
- pip packages: Flask, Pillow  
- A modern web browser (e.g., Chrome, Firefox)

# 3. Installation Instructions

Follow these steps to install and set up HashMapper:

1. Step 1: Download or Clone the Project

* Download the ZIP file or clone the GitHub repository to your local machine.

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1. Step 2: Set Up Python Environment

* Open your terminal and create a virtual environment (optional but recommended).

$ python3 -m venv venv  
$ source venv/bin/activate

1. Step 3: Install Python Packages

$ pip install flask Pillow

1. Step 4: Compile Java Files

* Use the provided script to compile Java source files:

$ ./compile\_java.sh (Linux/Mac)  
OR  
> compile\_java.bat (Windows)

# 4. Running the Application

1. Step 1: Start the Flask Server

* $ python app.py

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1. Step 2: Open the Application

* Navigate to http://localhost:5000 in your browser.

# A screenshot of a computer AI-generated content may be incorrect.5. Using HashMapper

1. Step 1: Enter Text

* Input any text into the provided text box.

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1. Step 2: Configure Options

* - Choose hash function (SimpleHashMap or DumbHashMap)  
  - Adjust salt level and smoothing radius if needed

1. Step 3: Generate Fingerprint

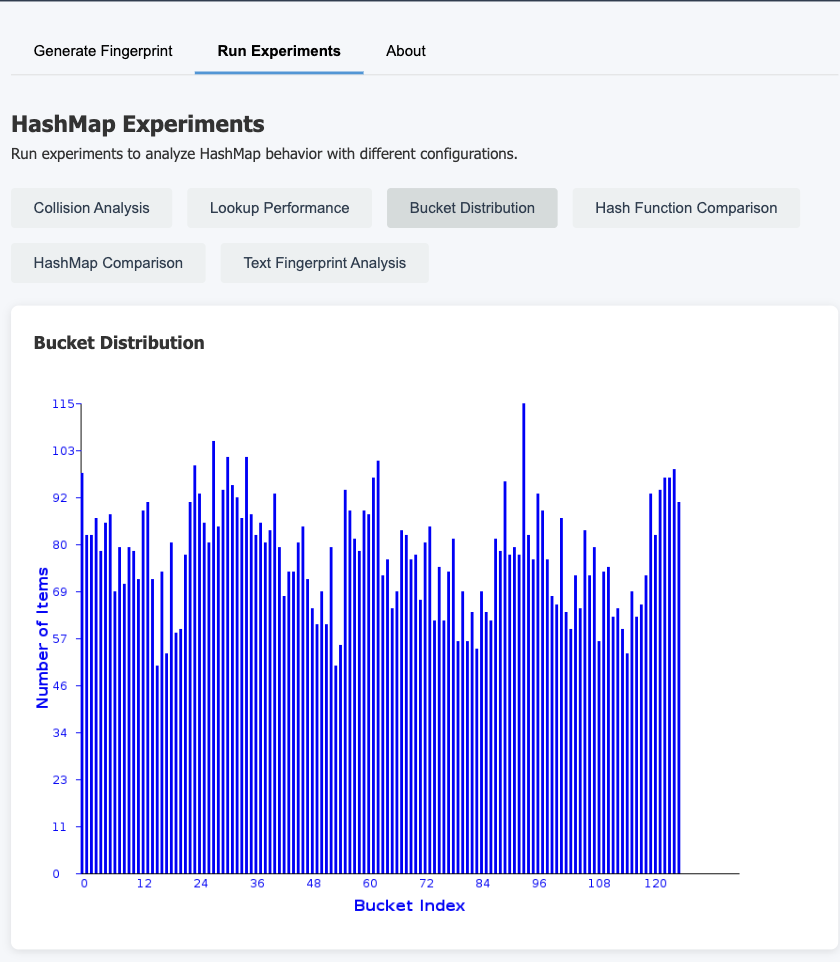
* Click on the 'Generate Fingerprint' button to create the visual representation.

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# 6. Viewing and Analyzing Results

After generating a fingerprint:  
- View the raw and enhanced fingerprint images  
- Download CSV reports for:  
 - Bucket distribution



- String collisions

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 - Lookup performance  
A screen shot of a graph

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-Hash Function Comparison

A screenshot of a graph

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-HashMap Comparison

A graph on a screen

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-Text fingerprint Analysis

A screenshot of a graph

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# 7. Using Java Backend Separately

If you want to run the Java part manually without using Flask:  
$ java -cp "lib/\*:.:java" HashMapper --text-file yourfile.txt --size 512 --hash-function SimpleHashMap

# 8. Troubleshooting

- Error: "Java not recognized" → Ensure Java is installed and added to PATH.  
- Error: "Flask module missing" → Run `$ pip install flask` inside the virtual environment.  
- Error: "Cannot find HashMapper class" → Re-run the Java compile script before starting.

# 9. Best Practices

- Use short to medium-length texts for faster visualization.  
- Experiment with salt level and smoothing radius to see different styles.  
- Use DumbHashMap for more collisions and chaotic images; SimpleHashMap for cleaner mapping.

# 10. Closing Notes

HashMapper is built not just as a visualization tool, but as an educational system to explore hashing behavior, collisions, and visualization design.