URL SHORTENER

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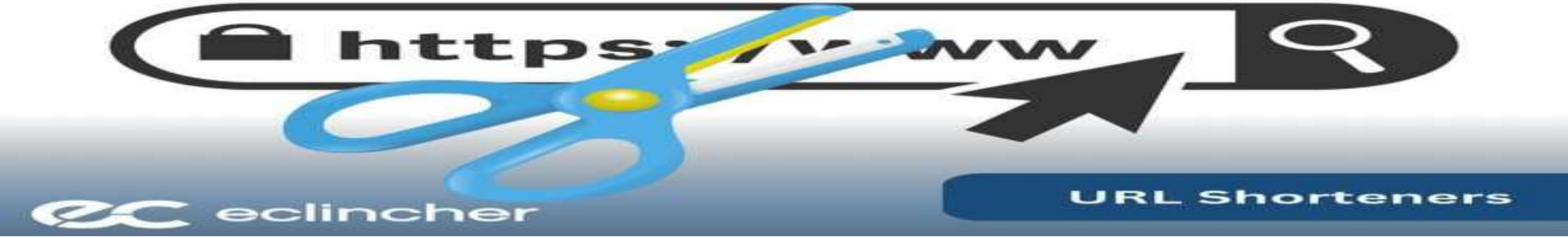
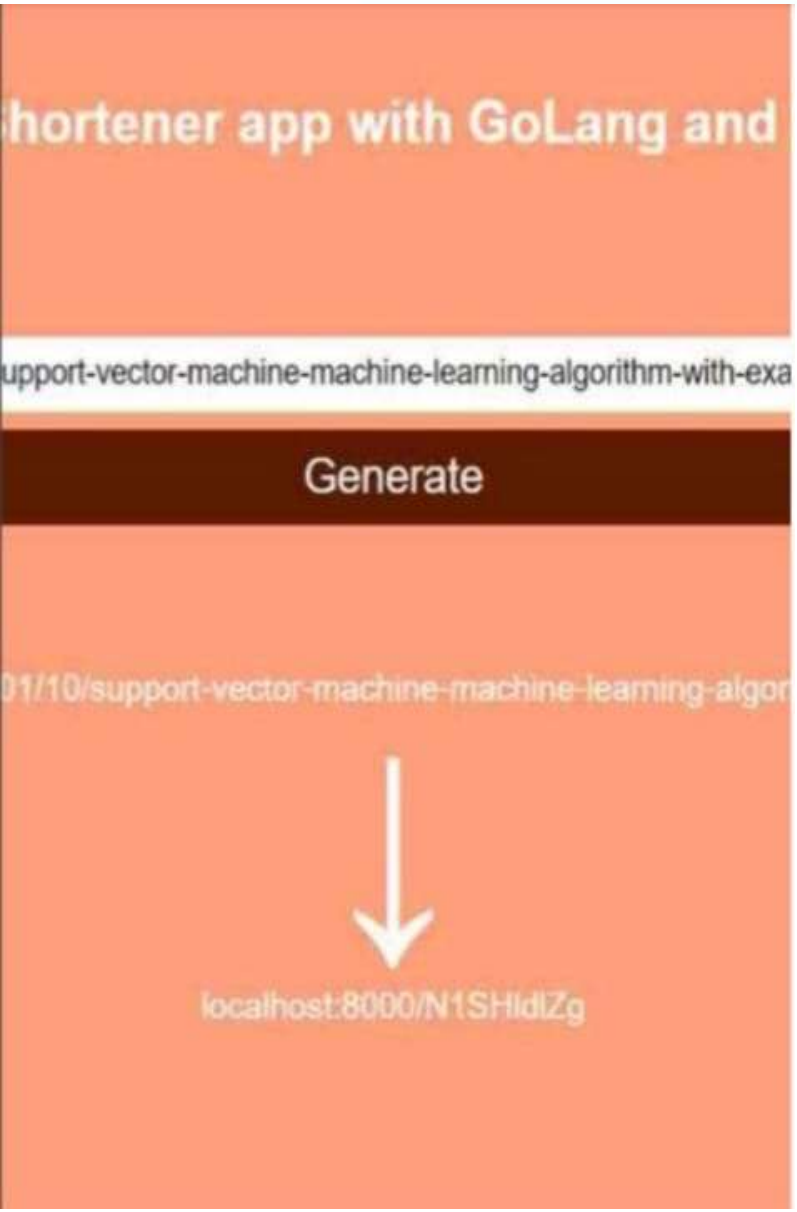


PROBLEM STATEMENT

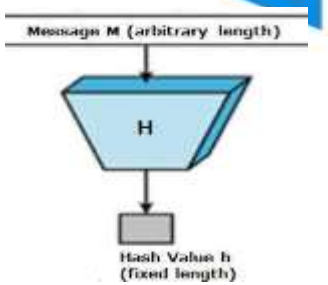
- In the age of digital communication, sharing long and complex URLs poses challenges, especially in platforms with character limitations.
- There is a need for a reliable and efficient URL shortening service that simplifies the process of link sharing while providing basic analytics.
- The existing solutions may lack user-friendly interfaces or may not prioritize simplicity and reliability.

INTRODUCTION



- The URL Shortener project seeks to streamline the process of sharing and managing links.
- With a focus on simplicity, efficiency, and reliability, the web-based application facilitates the conversion of lengthy URLs into concise and user-friendly short links.
- This not only eases sharing on platforms with character limitations but also enhances the overall user experience.
- The core functionalities encompass the submission of long URLs and the reception of shortened versions, coupled with a seamless redirection mechanism.
- By emphasizing simplicity and efficiency, the URL Shortener project aims to meet the fundamental need for efficient URL management without unnecessary complexities.

FEATURES



- **URL Shortening:** Users can submit long URLs to the system.The system generates a shortened URL for each submitted long URL.
- **URL Redirecting:** Users clicking on a shortened URL are seamlessly redirected to the original, longer URL.
- **Analytics (Basic):** Basic tracking of link usage, including the number of clicks on each shortened URL.
- **User Interaction:** Involves the exchange of information and actions between users and the system, facilitating a user-friendly experience.
- **Hash Functions:** Utilizes hash functions for quick and deterministic conversion of input data into fixed-size strings, ensuring uniqueness.
  Distributed Unique ID
- **Generator:** Ensures each long URL is hashed to a unique hashValue even when servers scale horizontally, achieved through a distributed unique id generator.
- **Rate Limiter:** Addresses potential security problems by filtering out requests, particularly those from malicious users, based on IP address or other filtering rules.

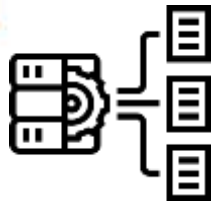
MODULES

- **URL Shortening Module:** Responsible for handling the submission of long URLs and generating corresponding shortened URLs.Includes the API endpoint for URL shortening and the logic for creating unique hash codes.
- **Analytics Module:** Provides basic tracking of link usage, including the number of clicks on each shortened URL. May involve data storage and retrieval for analytics purposes.
- **User Interaction Module:** Facilitates the exchange of information and actions between users and the system.Involves the user interface for submitting and managing URLs, ensuring a user-friendly experience.
- **User Authentication Module:** Manages authentication for regular users who have access to login and use the services.Handles user credentials and login-related functionalities.
- **Hashing and Unique ID Generation Module:** Implements hash functions for converting input data into fixed-size strings.Manages the generation of unique hash codes, especially when servers scale horizontally.

- **Security Module:** Addresses security concerns, particularly related to potential malicious users sending an overwhelming number of URL shortening requests.Implements a rate limiter to filter out requests based on IP address or other filtering rules.
- **Database Management Module:** Manages the user database storing login credentials.Designs and maintains the database structure for storing information related to original long URLs, shortened codes, and metadata.

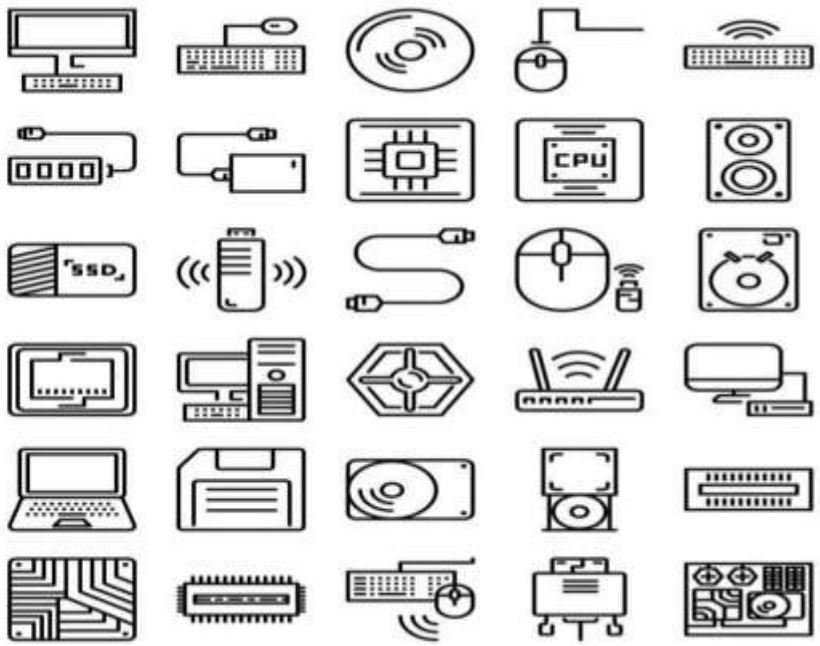
TECHNOLOGIES



- **Frontend Development:** HTML,CSS, JavaScriptReactJS for dynamic responsive UI.
- **Backend Development:** JAVA(Springboot)as a backend framework
- **Database Management System:** MySQL is used to store and manage the URL data.
- **Infrastructure and cloud services:** route 53, elastic kubernetes services and application load balancer.
- **Version control:**GitHub

REQUIREMENTS



HARDWARE: Standard devices with 8GB RAM and 1GB storage.

SOFTWARE: Visual StudioCode,Postman, Intellij IDEA,Java,AWS,MySQL,Github and Compatible Browsers.

THANK YOU