

Problem Statement	1
Solution : Web-Page-Analyzer	3
Before You Read	3
Repo	3
Backend Architecture	4
Frontend Architecture	4
Development Environment	5
How to Run	5
Working App	7
Swagger Link	7
Sync Analysis	7
Async Analysis	10
Application Logs	12
Back End Api Collection	13
Curl Commands	17
Future Improvements	17
Functional Improvements	17
Codebase Improvements	18

Problem Statement

Test task: Web application for analyzing web pages

Objective

The objective is to build a web application that does an analysis of a web-page/URL.

The application should show a form with a text field in which users can type in the URL of the web page to be analyzed. Additionally, to the form, it should contain a button to send a request to the server.

After processing, the results should be shown to the user.

Results should contain next information:

- What HTML version has the document?
- What is the page title?
- How many headings of what level are in the document?
- How many internal and external links are in the document? Are there any inaccessible links and how many?
- Does the page contain a login form?

In case the URL given by the user is not reachable an error message should be presented to a user. The message should contain the HTTP status code and a useful error description.

Restrictions

1. The application should be written in Golang
2. The application must be put under git control
3. You can use whatever libraries/tools you want.

Submission

Please provide the result as a git repo bundled with:

- A short text document that lists the main steps of building/deploying your solution as well as all assumptions/decisions you made in case of unclear requirements or missing information
- Suggestions on possible improvements of the application

Solution : Web-Page-Analyzer

Before You Read

- This is an MVP version of app for the problem statement
- Uses GIN framework, with Golang 1.20.3 (this is due to my system limitation)
- Unit tests are added for the service layer and core engine only (due to time limitations)
- No DI framework been used (just everything in plain go for now)

(It's not because I don't know about above but due to time constraints having limited time to evaluate everything)

Refer : Future Improvements

<https://docs.google.com/document/d/1xfNCxaxOy31HlbfKR4ZJKKHwKZMReVIBrxqa1vcY-U/e/dit?tab=t.0#heading=h.e83i5rjshrrq>

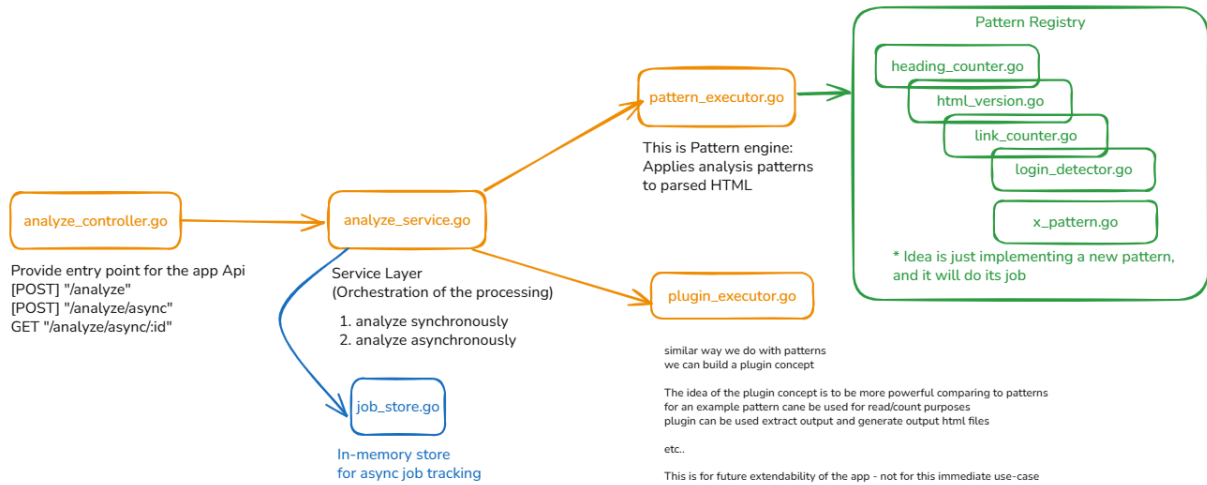
Repo

<https://github.com/ErandaUH/web-page-analyzer>

(It's public for now, please let me know once this evaluation is done, so I'll make it private)

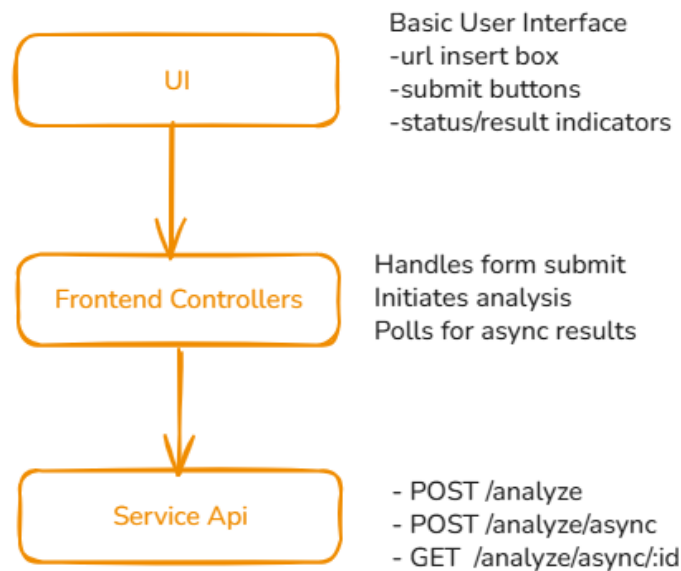
Backend Architecture

Back End Architecture
(GIN based api in Go)



Frontend Architecture

(HTML5 Basic UI)

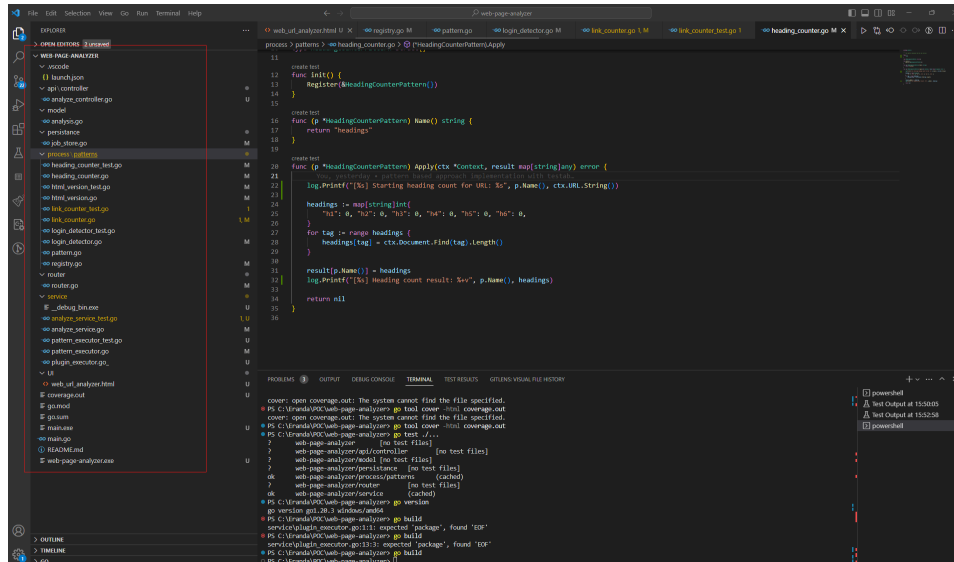


Development Environment

Windows Based PC

VSCode as IDE

Golang 1.20.3 (due to my system limitation)



How to Run

Running the BE Server

Option 1: Used to run via IDE (VSCode)

Option 2: Executable exe “web-page-analyzer.exe” is also in the repo itself (if you are using a windows based PC)

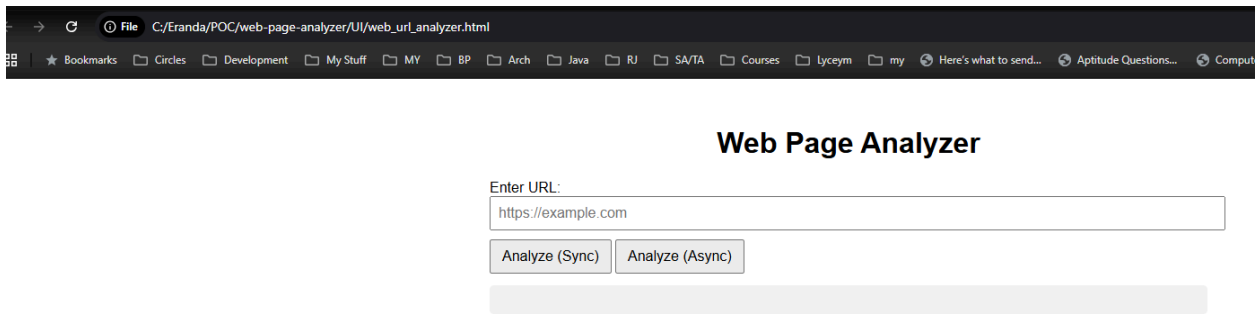
```
C:\Eranda\POC\web-page-analyzer X + -
Please check https://pkg.go.dev/github.com/gin-gonic/gin#readme-don-t-trust-all-proxies for details.
[GIN-debug] Listening and serving HTTP on :8080
[GIN] 2025/07/08 - 16:31:59 | 204 | 0s | ::1 | OPTIONS "/analyze"
2025/07/08 16:32:02 [INFO] Executing analysis patterns...
2025/07/08 16:32:02 [INFO] Executing pattern: headings
2025/07/08 16:32:02 [headings] Starting heading count for URL: https://alem.lk/welcome
2025/07/08 16:32:02 [headings] Heading count result: map[h1:0 h2:0 h3:0 h4:0 h5:1 h6:0]
2025/07/08 16:32:02 [INFO] Executed pattern: headings
2025/07/08 16:32:02 [INFO] Executing pattern: html_version
2025/07/08 16:32:02 [html_version] Starting HTML version detection for URL: https://alem.lk/welcome
2025/07/08 16:32:02 [html_version] Detected: HTML5
2025/07/08 16:32:02 [INFO] Executed pattern: html_version
2025/07/08 16:32:02 [INFO] Executing pattern: links
2025/07/08 16:32:02 [links] Starting link analysis for URL: https://alem.lk/welcome
2025/07/08 16:32:02 [links] No HTTP client provided. Using default with 5s timeout
2025/07/08 16:32:02 [links] Checking link: https://alem.lk/welcome
2025/07/08 16:32:03 [links] Internal link: https://alem.lk/welcome
2025/07/08 16:32:03 [links] Link analysis complete. Total: 1, Internal: 1, External: 0, Broken: 0
2025/07/08 16:32:03 [INFO] Executed pattern: links
2025/07/08 16:32:03 [INFO] Executing pattern: login_form_found
2025/07/08 16:32:03 [login_form_found] Starting login form detection
2025/07/08 16:32:03 [login_form_found] Login forms detected: 1
2025/07/08 16:32:03 [login_form_found] Login detection result: true
2025/07/08 16:32:03 [INFO] Executed pattern: login_form_found
2025/07/08 16:32:03 [INFO] Pattern execution completed
2025/07/08 16:32:03 [INFO] Finished analysis for URL: https://alem.lk/welcome
2025/07/08 16:32:03 [INFO] AnalysisResult constructed for URL: https://alem.lk/welcome
[GIN] 2025/07/08 - 16:32:03 | 200 | 3.8679645s | ::1 | POST "/analyze"

Option 1: Used to run via IDE (VSCode)
```

Running the FE

Go to Dir
\\web-page-analyzer\\UI

Just double click and open the “web_url_analyzer.html” in any browser
(its basic JS and HTML, so it should work on any browser, out-of-the-box)

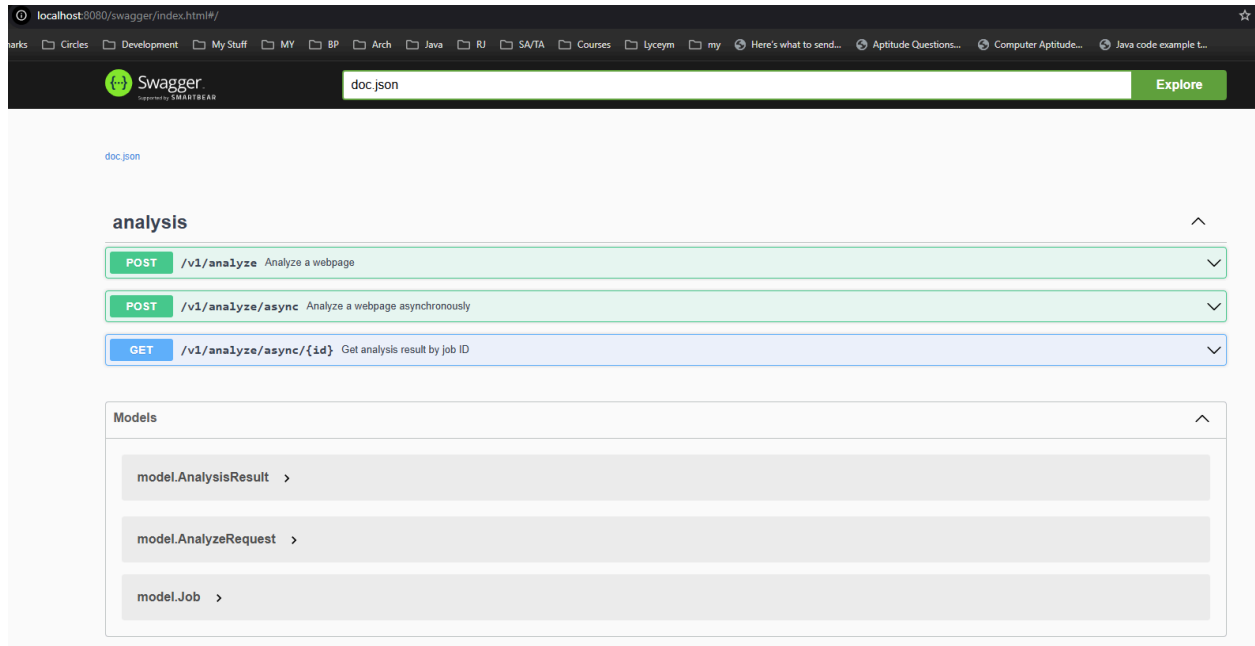


Working App

localhost:8080/health

Swagger Link

<http://localhost:8080/swagger/index.html#/>



Sync Analysis

Analyze synchronously (this will take a bit of a time, depending on the webpage complexity)

Start:


Web Page Analyzer

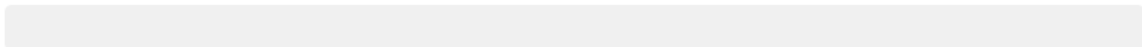
Enter URL:

<https://go.dev/doc/modules/managing-dependencies>

Analyze (Sync)

Analyze (Async)

 Analyzing synchronously...



Results:

Web Page Analyzer

Enter URL:

https://go.dev/doc/modules/managing-dependencies

Analyze (Sync)

Analyze (Async)

✅ **Analysis complete.**

```
{
  "html_version": "HTML5",
  "title": "Managing dependencies - The Go Programming Language",
  "headings": {
    "h1": 1,
    "h2": 15,
    "h3": 2,
    "h4": 0,
    "h5": 0,
    "h6": 0
  },
  "links": {
    "broken": 9,
    "external": 28,
    "internal": 100
  },
  "login_form_found": false
}
```

TO DO: display time for analysis, so this becomes handy!

Error:

Web Page Analyzer

Enter URL:

https://www.tesla.com/

Analyze (Sync)

Analyze (Async)

❌ **Failed to analyze!**

Show Error Details

Web Page Analyzer

Enter URL:

https://www.tesla.com/

Analyze (Sync)

Analyze (Async)

✖ Failed to analyze!

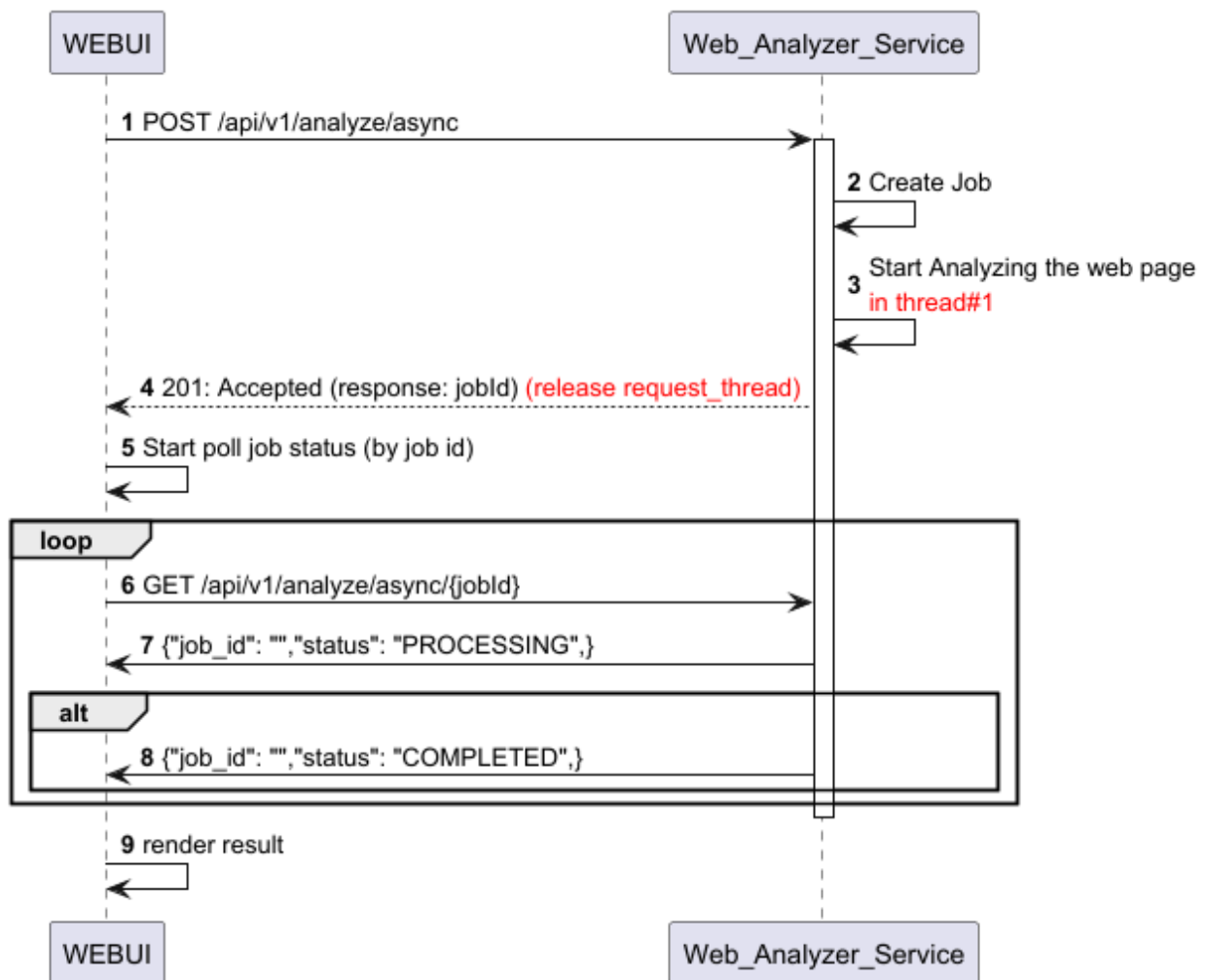
Hide Error Details

```
{  
  "error": "Get \"https://www.tesla.com/\": stream error: stream ID 1; INTERNAL_ERROR; received from peer"  
}
```

Async Analysis

In real world scenario, we should use async way of analyzing web pages as this HTML parse and evaluate is a time-consuming process

See the sequence:




Start: Returns the 'JobId' and continue processing

Web Page Analyzer

Enter URL:

Analyze (Sync) Analyze (Async)

Job ID: 98a4f2d5-639c-422c-b6ed-38131cd44083 (waiting...)



Network tab showing requests:

Name	Status	Type	Initiator	Size	Time
web_url_analyzer.html	200	document	Other	5.0 kB	4 ms
async	204	preflight	Preflight	0.0 kB	3 ms
async	202	fetch	web_url_analyzer.html:110	0.4 kB	5 ms
98a4f2d5-639c-422c-b6ed-38131cd44083	200	fetch	web_url_analyzer.html:122	0.4 kB	6 ms
98a4f2d5-639c-422c-b6ed-38131cd44083	200	fetch	web_url_analyzer.html:122	0.4 kB	2 ms
98a4f2d5-639c-422c-b6ed-38131cd44083	200	fetch	web_url_analyzer.html:122	0.4 kB	5 ms
98a4f2d5-639c-422c-b6ed-38131cd44083	200	fetch	web_url_analyzer.html:122	0.4 kB	3 ms
98a4f2d5-639c-422c-b6ed-38131cd44083	200	fetch	web_url_analyzer.html:122	0.4 kB	6 ms
98a4f2d5-639c-422c-b6ed-38131cd44083	200	fetch	web_url_analyzer.html:122	0.4 kB	4 ms
98a4f2d5-639c-422c-b6ed-38131cd44083	200	fetch	web_url_analyzer.html:122	0.4 kB	4 ms
98a4f2d5-639c-422c-b6ed-38131cd44083	200	fetch	web_url_analyzer.html:122	0.4 kB	3 ms
98a4f2d5-639c-422c-b6ed-38131cd44083	200	fetch	web_url_analyzer.html:122	0.4 kB	2 ms
98a4f2d5-639c-422c-b6ed-38131cd44083	200	fetch	web_url_analyzer.html:122	0.4 kB	7 ms

Results:

Web Page Analyzer

Enter URL:

Analyze (Sync)

Analyze (Async)

✓ Job completed successfully.

```
{
  "job_id": "98a4f2d5-639c-422c-b6ed-38131cd44083",
  "status": "COMPLETED",
  "result": {
    "html_version": "HTML5",
    "title": "Managing dependencies - The Go Programming Language",
    "headings": {
      "h1": 1,
      "h2": 15,
      "h3": 2,
      "h4": 0,
      "h5": 0,
      "h6": 0
    },
    "links": {
      "broken": 9,
      "external": 28,
      "internal": 100
    },
    "login_form_found": false
  },
  "created_at": "2025-07-10T02:53:39.213115+05:30"
}
```

Error:

Web Page Analyzer

Enter URL:

https://www.tesla.com/

Analyze (Sync)

Analyze (Async)

✖ Job failed!

Hide Error Details

Get "https://www.tesla.com/": stream error: stream ID 1; INTERNAL_ERROR; received from peer

```
{
  "job_id": "24255cc0-b783-486b-96aa-c3ecb3c412a2",
  "status": "FAILED",
  "error": "Get \"https://www.tesla.com/\": stream error: stream ID 1; INTERNAL_ERROR; received from peer",
  "created_at": "2025-07-10T03:12:51.5734907+05:30"
}
```

Application Logs

Log file is generated in the app folder with name `{app.log}`. [Logrus](#) (pluggable logging framework) is used for logging

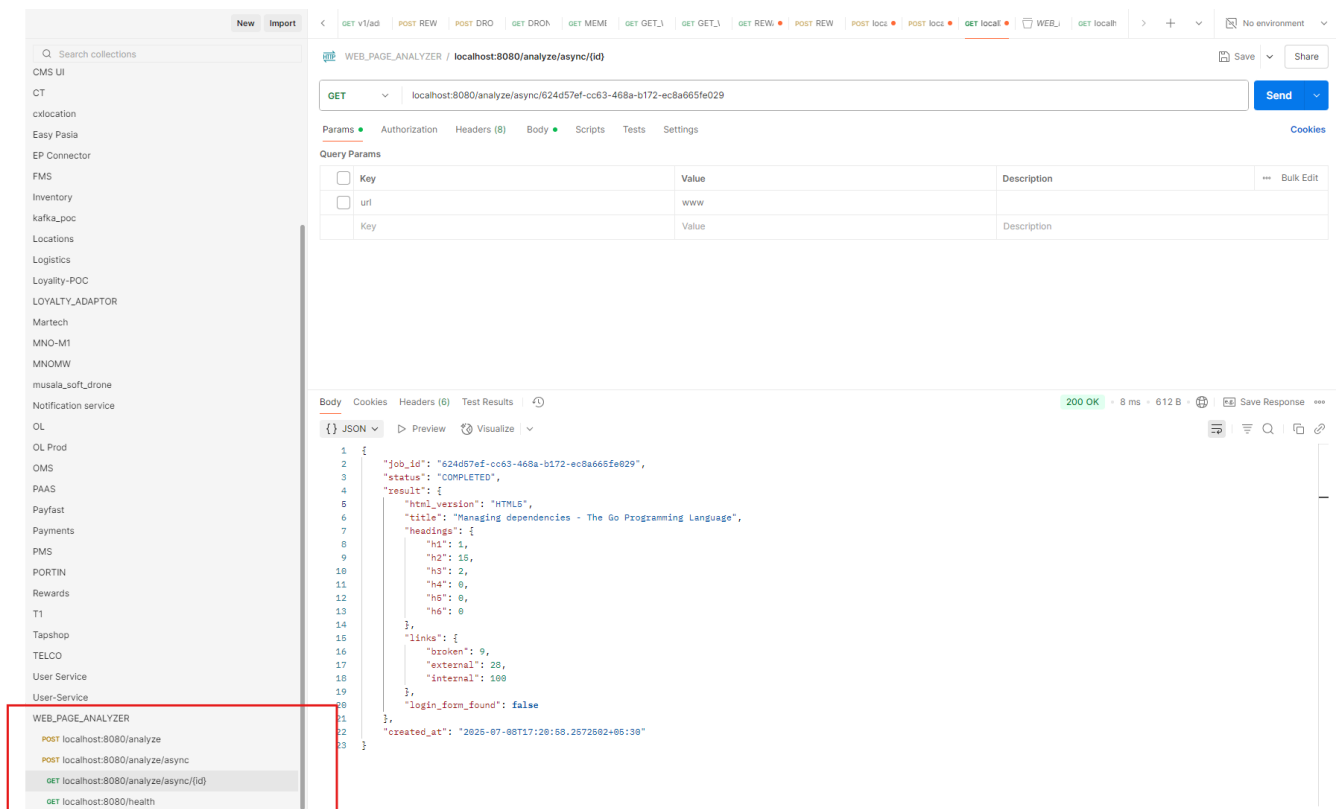
This PC > Windows (C:) > Eranda > POC > web-page-analyzer >				
Sort View ...				
Name	Date modified	Type	Size	
.git	7/10/2025 4:21 AM	File folder		
.vscode	7/4/2025 9:46 PM	File folder		
api	7/6/2025 1:49 PM	File folder		
docs	7/10/2025 3:00 AM	File folder		
logger	7/10/2025 3:32 AM	File folder		
model	7/7/2025 4:13 PM	File folder		
persistence	7/7/2025 4:25 PM	File folder		
process	7/8/2025 9:15 AM	File folder		
router	7/10/2025 2:47 AM	File folder		
service	7/9/2025 4:51 PM	File folder		
ui	7/8/2025 9:54 AM	File folder		
app.log	7/10/2025 4:21 AM	Text Document	10 KB	
coverage.out	7/8/2025 11:58 AM	OUT File	5 KB	
go.mod	7/10/2025 3:38 AM	MOD File	3 KB	
go.sum	7/10/2025 3:31 AM	SUM File	16 KB	
main.go	7/10/2025 3:50 AM	Go Source File	1 KB	
README.md	7/8/2025 6:11 PM	Markdown Source...	1 KB	
WEB_PAGE_ANALYZER.postman_collection.json	7/10/2025 3:00 AM	JSON Source File	3 KB	
web-page-analyzer.exe	7/10/2025 4:21 AM	Application	27,285 KB	
Web-Page-Analyzer.pdf	7/8/2025 6:20 PM	Microsoft Edge P...	891 KB	

```
telco_sql.txt * OKR.txt * iframe.html iframe - Copy.htm catalina.2024-12-0 issaa.txt id_ed25519.pub id_rsa.pub Untitled (1) Coupons Import ( config index packed-refs Untitled * app.log X
File Edit View

time="2025-07-10T03:52:47+05:30" level=info msg="Starting server..."
time="2025-07-10T03:53:18+05:30" level=info msg="Starting heading count" pattern=headings url="https://alem.lk/welcome"
time="2025-07-10T03:53:18+05:30" level=info msg="Heading count completed" pattern=headings result="map[h1:0 h2:0 h3:0 h4:0 h5:1 h6:0]"
time="2025-07-10T04:20:35+05:30" level=info msg="Starting server..."
time="2025-07-10T04:20:48+05:30" level=info msg="Starting async analysis" url="https://alem.lk/welcome"
time="2025-07-10T04:20:48+05:30" level=info msg="Job created" job_id=946e9389-746c-4b56-a695-a85488017093 url="https://alem.lk/welcome"
time="2025-07-10T04:20:50+05:30" level=info msg="Running analysis" job_id=946e9389-746c-4b56-a695-a85488017093 url="https://alem.lk/welcome"
time="2025-07-10T04:20:50+05:30" level=info msg="Parsed URL successfully" parsed_url="https://alem.lk/welcome" url="https://alem.lk/welcome"
time="2025-07-10T04:20:50+05:30" level=info msg="Executing analysis patterns..." url="https://alem.lk/welcome"
time="2025-07-10T04:20:50+05:30" level=info msg="Executing pattern" pattern=headings
time="2025-07-10T04:20:50+05:30" level=info msg="Starting heading count" pattern=headings url="https://alem.lk/welcome"
time="2025-07-10T04:20:50+05:30" level=info msg="Heading count completed" pattern=headings result="map[h1:0 h2:0 h3:0 h4:0 h5:1 h6:0]"
time="2025-07-10T04:20:50+05:30" level=info msg="Pattern executed successfully" elapsed=0s pattern=headings
time="2025-07-10T04:20:50+05:30" level=info msg="Executing pattern" pattern=html_version
time="2025-07-10T04:20:50+05:30" level=info msg="Starting HTML version detection" pattern=html_version url="https://alem.lk/welcome"
time="2025-07-10T04:20:50+05:30" level=info msg="Detected HTML5" pattern=html_version
time="2025-07-10T04:20:50+05:30" level=info msg="Pattern executed successfully" elapsed="773us" pattern=html version
```

Back End Api Collection

There are three main endpoints (excluding the health)



[POST] /v1/analyze

Perform **synchronous analysis** of a provided web page URL

Behavior:

- Parses the HTML document.
- Applies multiple analysis patterns (HTML version, headings, links, login form).
- Returns the complete result immediately.

Use Case: Suitable for fast analysis of user interaction in UI.

Request	Response
<pre>{ "url": "https://go.dev/doc/modules/managing-depe ndencies" }</pre>	<pre>{ "html_version": "HTML5", "title": "Managing dependencies - The Go Programming Language", "headings": { "h1": 1, "h2": 15, "h3": 2, "h4": 0, "h5": 0, "h6": 0 }, "links": { "broken": 9, "external": 28, "internal": 100 }, "login_form_found": false }</pre>

[POST] /v1/analyze/async

Initiates **asynchronous analysis** of a given URL

Behavior:

- Creates a job with a unique job ID.
- Starts analysis in a background goroutine.
- Immediately returns a job ID to the client.

Use Case: For long-running analysis or UI polling scenarios.

Request	Response
<pre>{ "url": "https://go.dev/doc/modules/managing-depe ndencies" }</pre>	<pre>{ "job_id": "624d57ef-cc63-468a-b172-ec8a665fe029", "status": "PROCESSING", "created_at":</pre>

	<pre>"2025-07-08T17:20:58.2572502+05:30" }</pre>
--	--

[GET] /v1/analyze/async/:id

Fetch the **status or result** of an async analysis job

Behavior:

- Checks if the job exists and its current status.
- Returns job details with result if available.

Use Case: For long-running analysis or UI polling scenarios.

Request	Response
<pre>../analyze/async/624d57ef-cc63-468a-b172-ec8a665fe029</pre>	<pre>{ "job_id": "624d57ef-cc63-468a-b172-ec8a665fe029", "status": "PROCESSING", "created_at": "2025-07-08T17:20:58.2572502+05:30" } OR { "job_id": "624d57ef-cc63-468a-b172-ec8a665fe029", "status": "COMPLETED", "result": { "html_version": "HTML5", "title": "Managing dependencies - The Go Programming Language", "headings": { "h1": 1, "h2": 15, "h3": 2, "h4": 0, "h5": 0, "h6": 0 }, }, }</pre>

	<pre> "links": { "broken": 9, "external": 28, "internal": 100 }, "login_form_found": false }, "created_at": "2025-07-08T17:20:58.2572502+05:30" } OR { "job_id": "624d57ef-cc63-468a-b172-ec8a665fe029", "status": "FAILED", "created_at": "2025-07-08T17:20:58.2572502+05:30", "error": "Html parse error!" }</pre>
--	--

[GET] /health

Health check endpoint to verify that the backend server is running.
Use case: Used by monitoring tools, load balancers, or during deployments.

Request	Response
../health	<pre>{ "status": "ok" }</pre>

Curl Commands

v1/analyze	<pre>curl --location 'localhost:8080/v1/analyze' \ --header 'Content-Type: application/json' \ --data '{ "url": "https://go.dev/doc/modules/managing-dependencies" }'</pre>
v1/analyze/async	<pre>curl --location 'localhost:8080/v1/analyze/async' \ --header 'Content-Type: application/json' \ --data '{ "url": "https://go.dev/doc/modules/managing-dependencies" }'</pre>
v1/analyze/async/id	<pre>curl --location 'localhost:8080/v1/analyze/async/624d57ef-cc63-468a-b172-ec8a665fe029' \ --data "</pre>
/health	<pre>curl --location 'localhost:8080/health'</pre>

Postman Collection here:

https://github.com/Erandauih/web-page-analyzer/blob/main/WEB_PAGE_ANALYZER.postman_collection.json

Future Improvements

Functional Improvements

- 1. Include Caching support for Frequent URLs**
Cache analyzed results with TTL (e.g., with Redis) to reduce redundant processing overhead.
- 2. Support Batch URL Analysis**
Accept a list of URLs for batch analysis in one request.

3. **Persist Async Jobs (Support Multipods)**

Replace in-memory store with persistent and centralized job store (e.g., PostgreSQL, Redis).

4. **Introduce Cleanup process/Job**

5. **Add elapsed time as a response attribute** (currently its in application logs)

6. **Add More Patterns**

e.g., Image analysis

Allow Uploading HTML Files

Add endpoint for uploading raw HTML files for offline page analysis.

Codebase Improvements

1. **Introduce Dependency Injection (DI):**

Use a DI framework for better testing and decoupling of dependencies
(need to explore more : Is it Google wire, the best choice??)