Name: Yining Tang
Andrew ID: yiningt

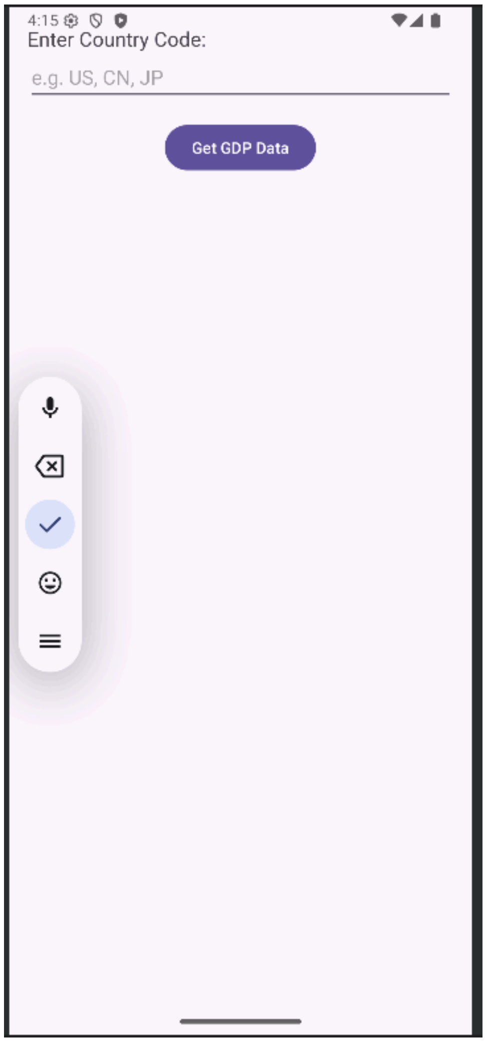
In this project, I want to show the GDP of different countries by year. Users can enter the country code, and GDP will display by year.

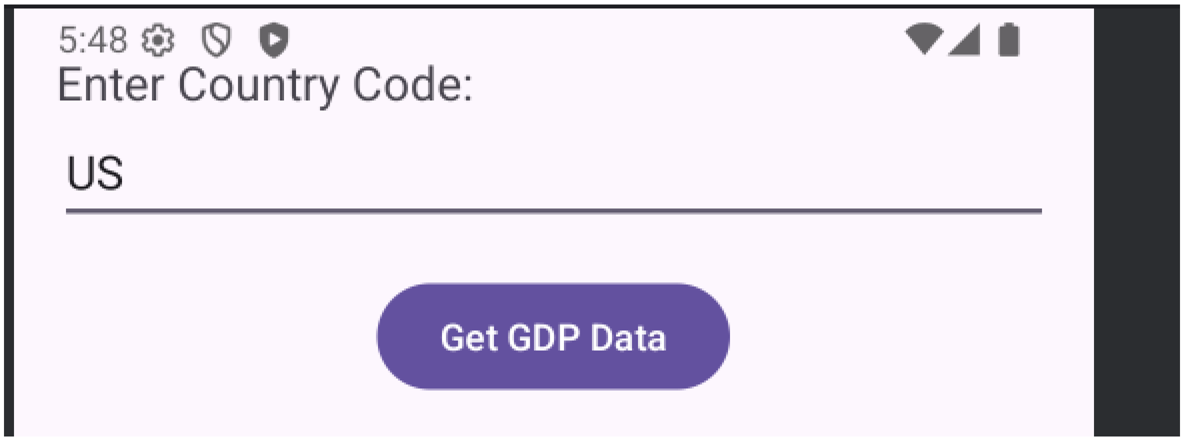
1. Implement a native Android application

a) Multiple View Types

Implemented EditText for country code input; Button to trigger data fetch; TextView to display results; ScrollView with dynamic TextView elements for multi-year GDP display; ProgressBar for loading state

b) Ask for user Input





c) HTTP Requests
https://[codespace-url]/gdp/[countryCode]
Codespace-url: https://legendary-space-computing-machine-gr6gj4g4xv5fwwgp-8080.app.github.dev/
Users need to enter a country code and can get each year's GDP of that country.

The request validates 2-letter country codes and makes GET requests to web service via AsyncTask in MainActivity.java:
new FetchGDPTask().execute(countryCode);
And it runs in the background as required.

d) JSON Parsing & Display

World Bank API Parsing:
JSONArray jsonResponse = new JSONArray(result);
JSONArray dataArray = jsonResponse.getJSONArray(1);
JSONObject yearData = dataArray.getJSONObject(i);

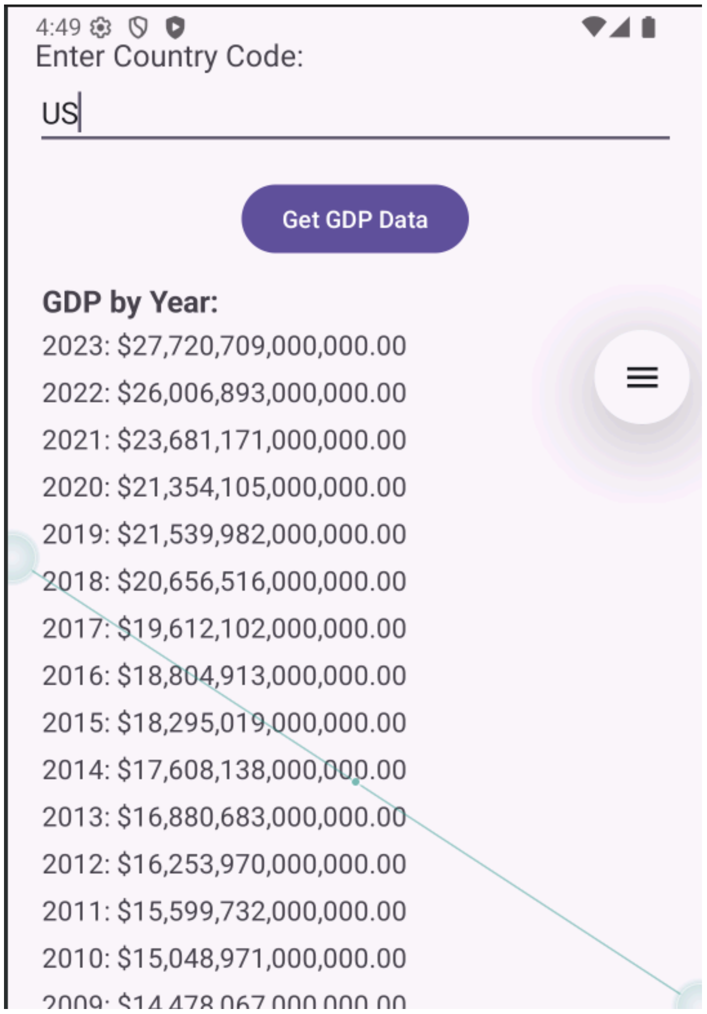
Parses World Bank API response format::
[{"page":1,...}, [{"indicator":..., "value":X, "date":"2023"}, ...]]

Examples:
[{"page":1,"pages":2,"per_page":50,"total":64,"sourceid":"2","lastupdated":"2025-03-24"},[{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2023","value":27720709000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2022","value":26006893000000,"unit":"","obs_stat

us":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2021","value":23681171000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2020","value":21354105000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2019","value":21539982000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United…

The app processes World Bank API response format and displays GDP history in scrollable format as shown below. It also formats currency values properly.

e) display new information



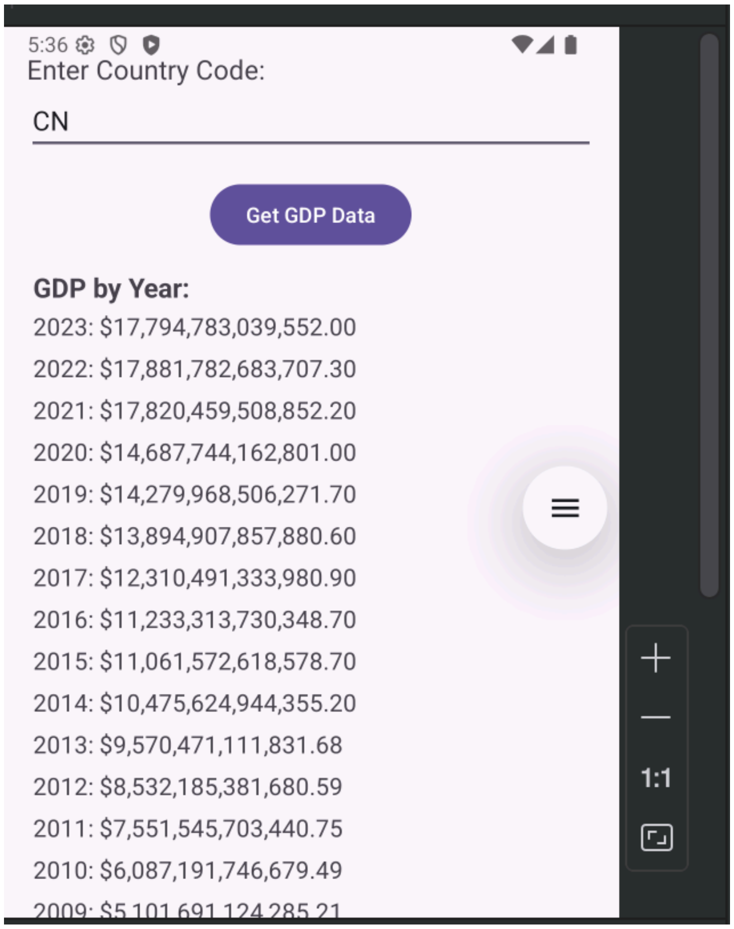
4:49

Enter Country Code:

US

GDP by Year:

```
2023: $27,720,709,000,000.00
2022: $26,006,893,000,000.00
2021: $23,681,171,000,000.00
2020: $21,354,105,000,000.00
2019: $21,539,982,000,000.00
2018: $20,656,516,000,000.00
2017: $19,612,102,000,000.00
2016: $18,804,913,000,000.00
2015: $18,295,019,000,000.00
2014: $17,608,138,000,000.00
2013: $16,880,683,000,000.00
2012: $16,253,970,000,000.00
2011: $15,599,732,000,000.00
2010: $15,048,971,000,000.00
2009: $14,478,067,000,000.00
```



Enter Country Code:

CN

GDP by Year:

```
2023: $17,794,783,039,552.00
2022: $17,881,782,683,707.30
2021: $17,820,459,508,852.20
2020: $14,687,744,162,801.00
2019: $14,279,968,506,271.70
2018: $13,894,907,857,880.60
2017: $12,310,491,333,980.90
2016: $11,233,313,730,348.70
2015: $11,061,572,618,578.70
2014: $10,475,624,944,355.20
2013: $9,570,471,111,831.68
2012: $8,532,185,381,680.59
2011: $7,551,545,703,440.75
2010: $6,087,191,746,679.49
2009: $5,101,691,124,285.21
```

f) repeatable

Users can query multiple countries without app restart. E.g. I entered CN after entering the US as shown above and it gave me answers accordingly.

2. Implement a web service

a.

My servlet endpoint:

```
@WebServlet("/gdp/*")  // Handles /gdp/US, /gdp/CN, etc.
protected void doGet(HttpServletRequest req, HttpServletResponse resp) {
    // Fetches data from World Bank API
    // Logs to MongoDB
    // Returns JSON array
}
```

B.

Android → Web Service:

```
// Android code (MainActivity.java)
String apiUrl = https://[codespace-url]/gdp/[countryCode]
```

Web Service Handling:
// GDPWebService.java
String countryCode = req.getPathInfo().substring(1); // Country Code Extraction

c.
My API design:
It accepts country code via URL path, and returns HTTP 200 with JSON array on success; HTTP 404/500 with error message on failure

Business Logic:

1) Fetches GDP data from World Bank API
2) Processes response to extract relevant fields
3) Implements server-side input validation

Third-Party API:
Uses World Bank API (approved, not banned)
Fetches JSON directly:

```
String apiUrl = "https://api.worldbank.org/v2/country/" + countryCode +
"/indicator/NY.GDP.MKTP.CD?format=json";
```

No screen scraping (pure JSON API).

Processing:
I forward raw API response without unnecessary computation:
resp.getWriter().write(apiResponse);
No over-fetching: Returns only what Android needs (GDP values by year).

d.
Response Format:
resp.setContentType("application/json"); // Explicit JSON
resp.getWriter().write(apiResponse); // Original World Bank JSON

Android parses only what it needs:
// parses only "date" and "value" fields
JSONObject yearData = dataArray.getJSONObject(i);
String year = yearData.optString("date");
double gdpValue = yearData.optDouble("value");

4.
All the needed information are extracted and store in log:

private Document createLogEntry(HttpServletRequest req, String countryCode, String apiResponse) {

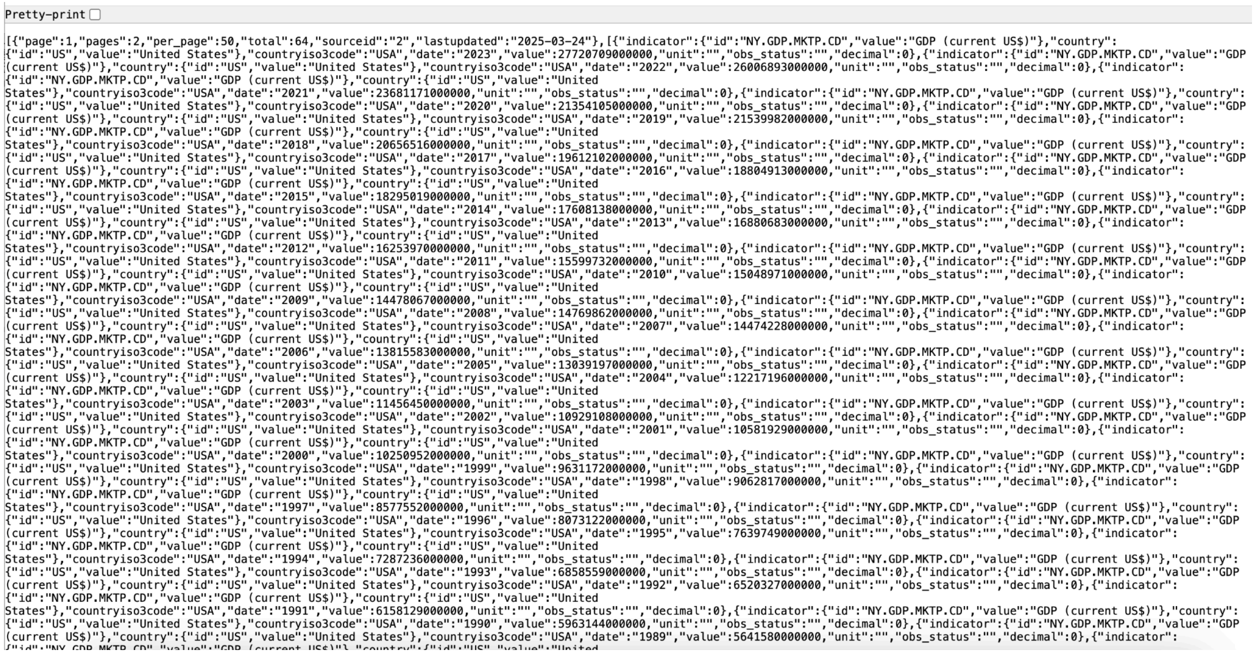
```
        return new Document()
                .append("country", countryCode)                    // 1. Requested country
                .append("userAgent", req.getHeader("User-Agent"))   // 2. Android device info
                .append("clientIP", req.getRemoteAddr())            // 3. Client IP address
                .append("apiEndpoint", WORLD_BANK_API)              // 4. Which API was
called
                .append("requestMethod", req.getMethod())           // 5. HTTP method (GET)
                .append("responseSize", apiResponse.length())       // 6. Response size in
bytes
                .append("serverProcessingTime", System.currentTimeMillis() -
req.getSession().getCreationTime()) // 7. Processing time
                .append("timestamp", new Date())             // 8. Request timestamp
                .append("response", apiResponse);  // 9.Response data
    }
```

5.
Cloud Atlas Connection:

```
public void init() {
   String uri = "mongodb+srv://yiningt:(passwd
here)@cluster0.ij87b.mongodb.net/?retryWrites=true&w=majority&appName=Cluster0"
;
   this.mongoClient = MongoClients.create(uri);
}
```

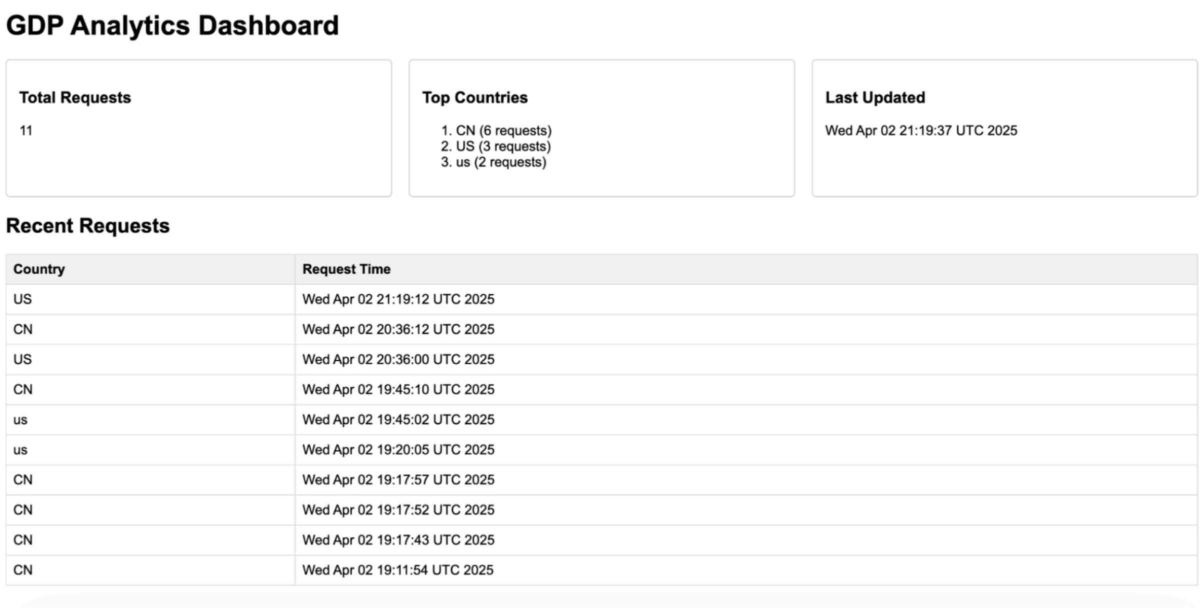
CRUD Operations:
Insert: collection.insertOne(logEntry)
Query: Used in dashboard analytics.

6.
http://localhost:8080/Project4Task2-1.0-SNAPSHOT/gdp/US
http://localhost:8080/Project4Task2-1.0-SNAPSHOT/dashboard.jsp



Pretty-print ☐

```
[{"page":1,"pages":2,"per_page":50,"total":64,"sourceid":"2","lastupdated":"2025-03-24"},[{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2023","value":27720709000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2022","value":26006893000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"2021","value":23681171000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2020","value":21354105000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2019","value":21539982000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"2018","value":20656516000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2017","value":19612102000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2016","value":18804913000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"2015","value":18295019000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2014","value":17608138000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2013","value":16880683000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"2012","value":16253970000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2011","value":15599732000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2010","value":15048971000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"2009","value":14478067000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2008","value":14769862000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2007","value":14474228000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"2006","value":13815583000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2005","value":13039197000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2004","value":12217196000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"2003","value":11456450000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2002","value":10929108000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2001","value":10581929000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"2000","value":10250952000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"1999","value":9631172000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"1998","value":9062817000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"1997","value":8577552000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"1996","value":8073122000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"1995","value":7639749000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"1994","value":7287236000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"1993","value":6858559000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"1992","value":6520327000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"1991","value":6158129000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"1990","value":5963144000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"1989","value":5641580000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
```



GDP Analytics Dashboard

Total Requests

11

Top Countries

1. CN (6 requests)
2. US (3 requests)
3. us (2 requests)

Last Updated

Wed Apr 02 21:19:37 UTC 2025

Recent Requests

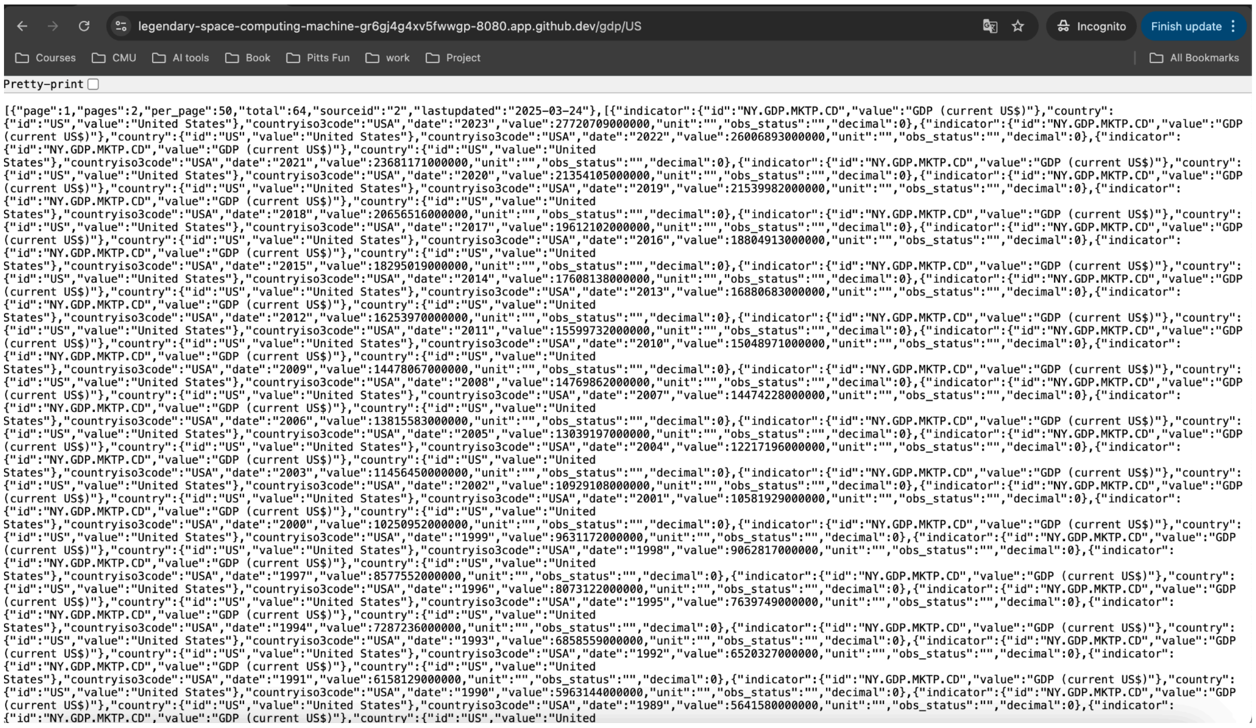
Country	Request Time
US	Wed Apr 02 21:19:12 UTC 2025
CN	Wed Apr 02 20:36:12 UTC 2025
US	Wed Apr 02 20:36:00 UTC 2025
CN	Wed Apr 02 19:45:10 UTC 2025
us	Wed Apr 02 19:45:02 UTC 2025
us	Wed Apr 02 19:20:05 UTC 2025
CN	Wed Apr 02 19:17:57 UTC 2025
CN	Wed Apr 02 19:17:52 UTC 2025
CN	Wed Apr 02 19:17:43 UTC 2025
CN	Wed Apr 02 19:11:54 UTC 2025

7.

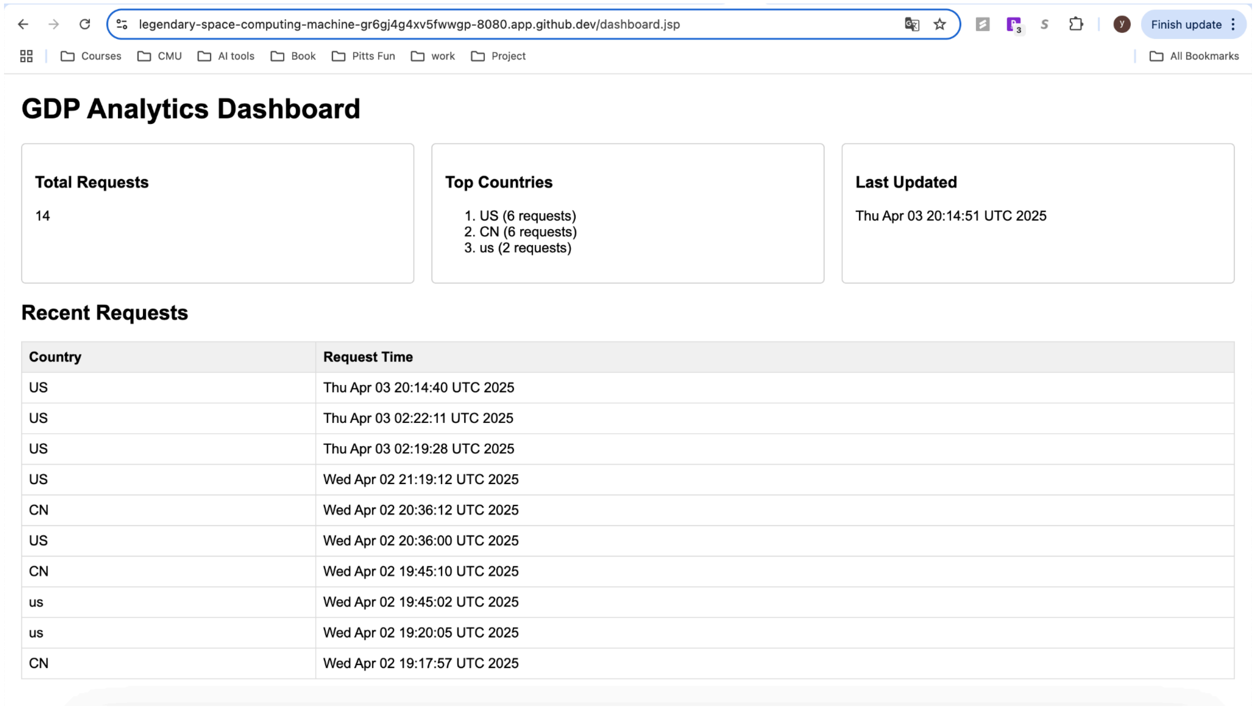
E.g.

https://legendary-space-computing-machine-gr6gj4g4xv5fwwgp-8080.app.github.dev/gdp/US

https://legendary-space-computing-machine-gr6gj4g4xv5fwwgp-8080.app.github.dev/dashboard.jsp



```
[{"page":1,"pages":2,"per_page":50,"total":64,"sourceid":"2","lastupdated":"2025-03-24"},[{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2023","value":27720709000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2022","value":26006893000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"2021","value":23681171000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2020","value":21354105000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2019","value":21539982000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"2018","value":20656516000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2017","value":19612102000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2016","value":18804913000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"2015","value":18295019000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2014","value":17608138000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2013","value":16880683000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"2012","value":16253970000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2011","value":15599732000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2010","value":15048971000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"2009","value":14478067000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2008","value":14769862000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2007","value":14474228000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"2006","value":13815583000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2005","value":13039197000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2004","value":12217196000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"2003","value":11456450000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2002","value":10929108000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"2001","value":10581929000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"2000","value":10250952000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"1999","value":9631172000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"1998","value":9062817000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"1997","value":8577552000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"1996","value":8073122000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"1995","value":7639749000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"1994","value":7287236000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"1993","value":6858559000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"1992","value":6520327000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
States"},"countryiso3code":"USA","date":"1991","value":6158129000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":
{"id":"US","value":"United States"},"countryiso3code":"USA","date":"1990","value":5963144000000,"unit":"","obs_status":"","decimal":0},{"indicator":{"id":"NY.GDP.MKTP.CD","value":"GDP
(current US$)"},"country":{"id":"US","value":"United States"},"countryiso3code":"USA","date":"1989","value":5641580000000,"unit":"","obs_status":"","decimal":0},{"indicator":
{"id":"NY.GDP.MKTP.CD","value":"GDP (current US$)"},"country":{"id":"US","value":"United
```



legendary-space-computing-machine-gr6gj4g4xv5fwwgp-8080.app.github.dev/dashboard.jsp
Finish update
Courses
CMU
AI tools
Book
Pitts Fun
work
Project
All Bookmarks

GDP Analytics Dashboard

Total Requests

14

Top Countries

1. US (6 requests)
2. CN (6 requests)
3. us (2 requests)

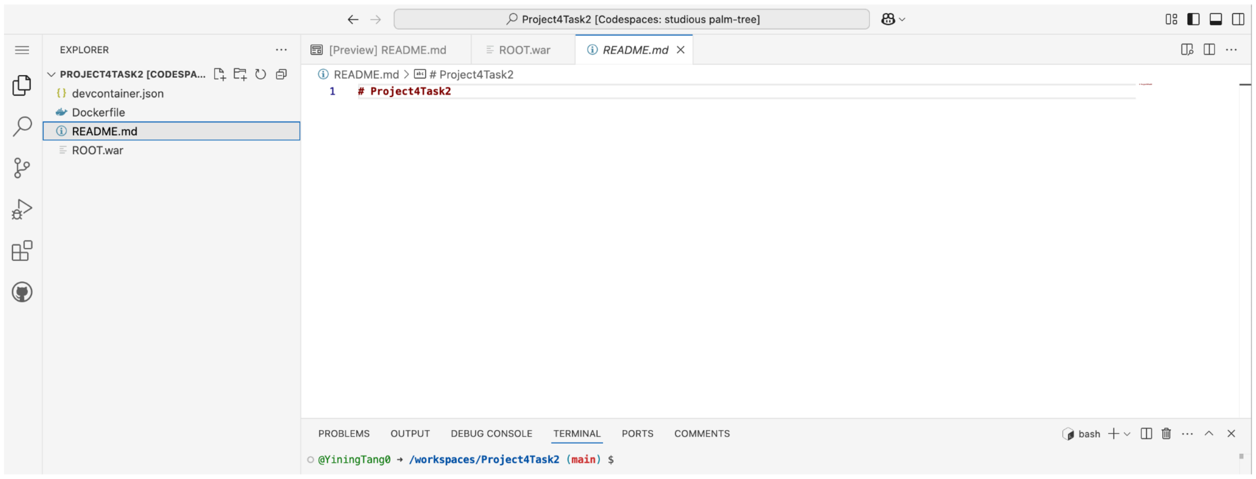
Last Updated

Thu Apr 03 20:14:51 UTC 2025

Recent Requests

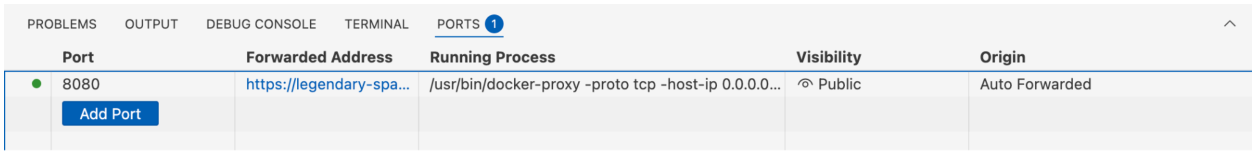
Country	Request Time
US	Thu Apr 03 20:14:40 UTC 2025
US	Thu Apr 03 02:22:11 UTC 2025
US	Thu Apr 03 02:19:28 UTC 2025
US	Wed Apr 02 21:19:12 UTC 2025
CN	Wed Apr 02 20:36:12 UTC 2025
US	Wed Apr 02 20:36:00 UTC 2025
CN	Wed Apr 02 19:45:10 UTC 2025
us	Wed Apr 02 19:45:02 UTC 2025
us	Wed Apr 02 19:20:05 UTC 2025
CN	Wed Apr 02 19:17:57 UTC 2025

Codespace picture:



```
# Project4Task2
```

```
@YiningTang0 ➜ /workspaces/Project4Task2 (main) $
```



Port	Forwarded Address	Running Process	Visibility	Origin
8080	https://legendary-spa...	/usr/bin/docker-proxy -proto tcp -host-ip 0.0.0.0...	Public	Auto Forwarded

Codespace terminal running:

```
@YiningTang0 ➜ /workspaces/Project4Task2 (main) $ docker build -t project4_task2 .
[+] Building 0.4s (8/8) FINISHED                                    docker:default
 => [internal] load build definition from Dockerfile                          0.0s
 => => transferring dockerfile: 462B                                          0.0s
 => [internal] load metadata for docker.io/library/tomcat:11.0.0-M24-jdk21-temu  0.2s
 => [auth] library/tomcat:pull token for registry-1.docker.io                 0.0s
 => [internal] load .dockerignore                                             0.0s
 => => transferring context: 2B                                               0.0s
 => [internal] load build context                                             0.0s
 => => transferring context: 31B                                              0.0s
 => [1/2] FROM docker.io/library/tomcat:11.0.0-M24-jdk21-temurin-noble@sha256:d
0.0s
 => CACHED [2/2] COPY ROOT.war /usr/local/tomcat/webapps/                     0.0s
 => exporting to image                                                        0.0s
 => => exporting layers                                                       0.0s
 => => writing image
sha256:592a305641556cdb1e43e9ee192b83ca3542225590e739f74e3  0.0s
 => => naming to docker.io/library/project4_task2                             0.0s
@YiningTang0 ➜ /workspaces/Project4Task2 (main) $ docker images
REPOSITORY       TAG       IMAGE ID       CREATED        SIZE
project4_task2   latest    592a30564155   23 hours ago   510MB
```

```
@YiningTang0 ➜ /workspaces/Project4Task2 (main) $ docker run --rm -it -p 8080:8080
project4_task2
Using CATALINA_BASE:   /usr/local/tomcat
Using CATALINA_HOME:   /usr/local/tomcat
Using CATALINA_TMPDIR: /usr/local/tomcat/temp
Using JRE_HOME:        /opt/java/openjdk
Using CLASSPATH:
/usr/local/tomcat/bin/bootstrap.jar:/usr/local/tomcat/bin/tomcat-juli.jar
Using CATALINA_OPTS:
03-Apr-2025 20:14:17.009 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Server version name:   Apache
Tomcat/11.0.0-M24
03-Apr-2025 20:14:17.041 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Server built:          Aug 2 2024
13:16:30 UTC
03-Apr-2025 20:14:17.050 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Server version number: 11.0.0.0
03-Apr-2025 20:14:17.051 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log OS Name:               Linux
03-Apr-2025 20:14:17.051 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log OS Version:
6.8.0-1021-azure
03-Apr-2025 20:14:17.051 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Architecture:          amd64
03-Apr-2025 20:14:17.055 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Java Home:
/opt/java/openjdk
03-Apr-2025 20:14:17.057 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log JVM Version:
21.0.4+7-LTS
03-Apr-2025 20:14:17.058 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log JVM Vendor:            Eclipse
Adoptium
03-Apr-2025 20:14:17.058 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log CATALINA_BASE:
/usr/local/tomcat
03-Apr-2025 20:14:17.058 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log CATALINA_HOME:
/usr/local/tomcat
```

```
03-Apr-2025 20:14:17.104 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Command line argument:
-Djava.util.logging.config.file=/usr/local/tomcat/conf/logging.properties
03-Apr-2025 20:14:17.105 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Command line argument:
-Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager
03-Apr-2025 20:14:17.105 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Command line argument:
-Xmx300m
03-Apr-2025 20:14:17.105 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Command line argument:
-Djdk.tls.ephemeralDHKeySize=2048
03-Apr-2025 20:14:17.105 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Command line argument:
-Dorg.apache.catalina.security.SecurityListener.UMASK=0027
03-Apr-2025 20:14:17.105 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Command line argument:
--add-opens=java.base/java.lang=ALL-UNNAMED
03-Apr-2025 20:14:17.106 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Command line argument:
--add-opens=java.base/java.io=ALL-UNNAMED
03-Apr-2025 20:14:17.107 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Command line argument:
--add-opens=java.base/java.util=ALL-UNNAMED
03-Apr-2025 20:14:17.110 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Command line argument:
--add-opens=java.base/java.util.concurrent=ALL-UNNAMED
03-Apr-2025 20:14:17.114 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Command line argument:
--add-opens=java.rmi/sun.rmi.transport=ALL-UNNAMED
03-Apr-2025 20:14:17.114 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Command line argument:
--enable-native-access=ALL-UNNAMED
03-Apr-2025 20:14:17.114 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Command line argument:
-Dcatalina.base=/usr/local/tomcat
03-Apr-2025 20:14:17.114 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Command line argument:
-Dcatalina.home=/usr/local/tomcat
```

```
03-Apr-2025 20:14:17.115 INFO [main]
org.apache.catalina.startup.VersionLoggerListener.log Command line argument:
-Djava.io.tmpdir=/usr/local/tomcat/temp
03-Apr-2025 20:14:17.178 INFO [main]
org.apache.catalina.core.AprLifecycleListener.lifecycleEvent Loaded Apache Tomcat
Native library [2.0.8] using APR version [1.7.2].
03-Apr-2025 20:14:17.192 INFO [main]
org.apache.catalina.core.AprLifecycleListener.initializeSSL OpenSSL successfully
initialized [OpenSSL 3.0.13 30 Jan 2024]
03-Apr-2025 20:14:17.798 INFO [main] org.apache.coyote.AbstractProtocol.init
Initializing ProtocolHandler ["http-nio-8080"]
03-Apr-2025 20:14:17.833 INFO [main] org.apache.catalina.startup.Catalina.load
Server initialization in [1132] milliseconds
03-Apr-2025 20:14:17.927 INFO [main]
org.apache.catalina.core.StandardService.startInternal Starting service [Catalina]
03-Apr-2025 20:14:17.928 INFO [main]
org.apache.catalina.core.StandardEngine.startInternal Starting Servlet engine: [Apache
Tomcat/11.0.0-M24]
03-Apr-2025 20:14:17.993 INFO [main]
org.apache.catalina.startup.HostConfig.deployWAR Deploying web application archive
[/usr/local/tomcat/webapps/ROOT.war]
03-Apr-2025 20:14:18.782 INFO [main] org.apache.jasper.servlet.TldScanner.scanJars
At least one JAR was scanned for TLDs yet contained no TLDs. Enable debug logging
for this logger for a complete list of JARs that were scanned but no TLDs were found in
them. Skipping unneeded JARs during scanning can improve startup time and JSP
compilation time.
03-Apr-2025 20:14:18.874 INFO [main]
org.apache.catalina.startup.HostConfig.deployWAR Deployment of web application
archive [/usr/local/tomcat/webapps/ROOT.war] has finished in [880] ms
03-Apr-2025 20:14:18.879 INFO [main] org.apache.coyote.AbstractProtocol.start
Starting ProtocolHandler ["http-nio-8080"]
03-Apr-2025 20:14:18.891 INFO [main] org.apache.catalina.startup.Catalina.start
Server startup in [1054] milliseconds
03-Apr-2025 20:14:39.698 WARNING [http-nio-8080-exec-3]
com.mongodb.diagnostics.logging.Loggers.shouldUseSLF4J SLF4J not found on the
classpath.  Logging is disabled for the 'org.mongodb.driver' component
```