

Project 4 Task 2 – Cheapest Game App

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Description:

This mobile app helps users find the cheapest price of a game on Steam they are interested in. Firstly, a user could input a keyword (e.g. batman, Happy, ball, spiderman, etc.). After clicking the “Submit” button, they could find the game on Steam based on the information returned coming with the cheapest price.

Third-party API: CheapShark

Third-party API URL: <https://apidocs.cheapshark.com/>

Here is how my application meets the task requirements:

1. Implement a native Android application

The name of our native Android application project in Android Studio is: **Project4**

a. Has at least three different kinds of views in your layout (TextView, EditText, ImageView, etc.)

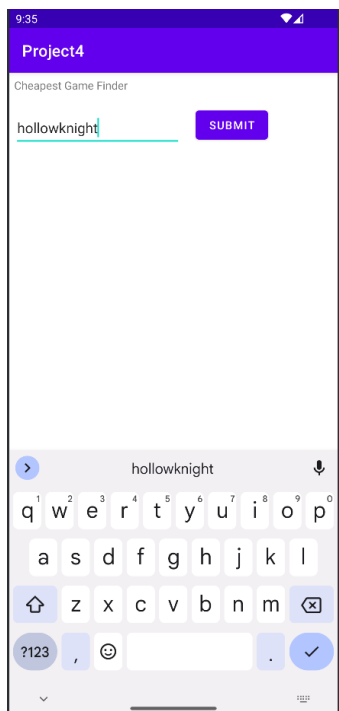
My application uses TextView, EditText, Button, and ImageView. See content_main.xml for details of how they are incorporated into the LinearLayout.

Here is a screenshot of the layout before the data has been fetched:



b. Requires input from users

Here is a screenshot of a user inputting “hollowknight” as a keyword for searching.



c. Make an HTTP request (using an appropriate HTTP method) to your web service

My application does an HTTP GET request in FetchData.java. The HTTP request is:

“https://cchen72-automatic-space-train-p95jggxg49frpg5-8080.preview.app.github.dev/api-getCheapestGame?keyword="+keyword”

(keyword is the user input)

```
try {  
    // create the URL  
    URL url = new URL( spec: "https://cchen72-automatic-space-train-p95jggxg49frpg5-8080.preview.app.github.dev/api-getCheapestGame?keyword="+keyword );  
    // connect to the servlet
```

The search() method makes this request of my web application and receives the JSON response.

Then the processData() method will parse the JSON response and get the gameName, steamID, price and the picture url.

getRemoteImage() will use the input url to return the Bitmap of a picture.

d. Receives and parses an XML or JSON formatted reply from the web service

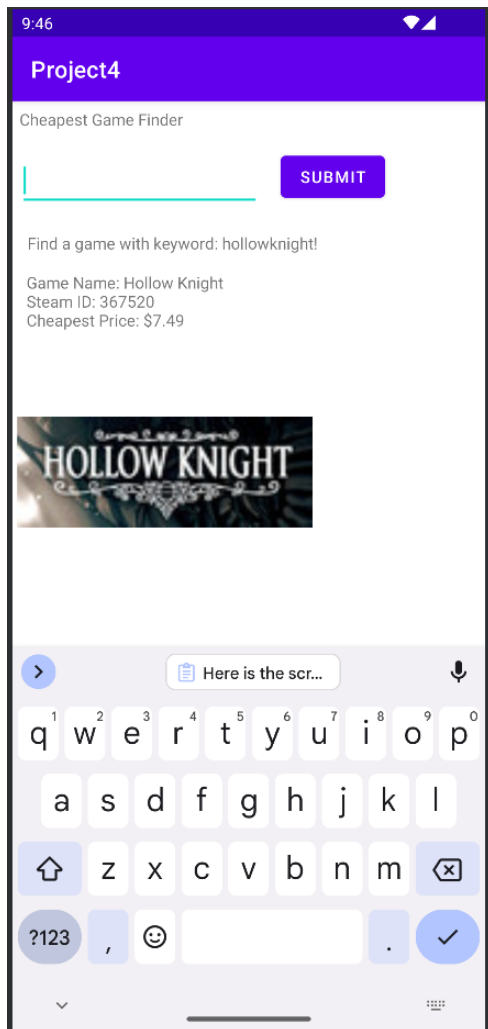
An example of the JSON formatted reply is:

{"gameName":"Hollow

Knight","steamAppID":"367520","cheapestPrice":"7.49","pictureURL":"https://cdn.cloudflare.steamstatic.com/steam/apps/367520/capsule_sm_120.jpg?t\u003d1667006028"}

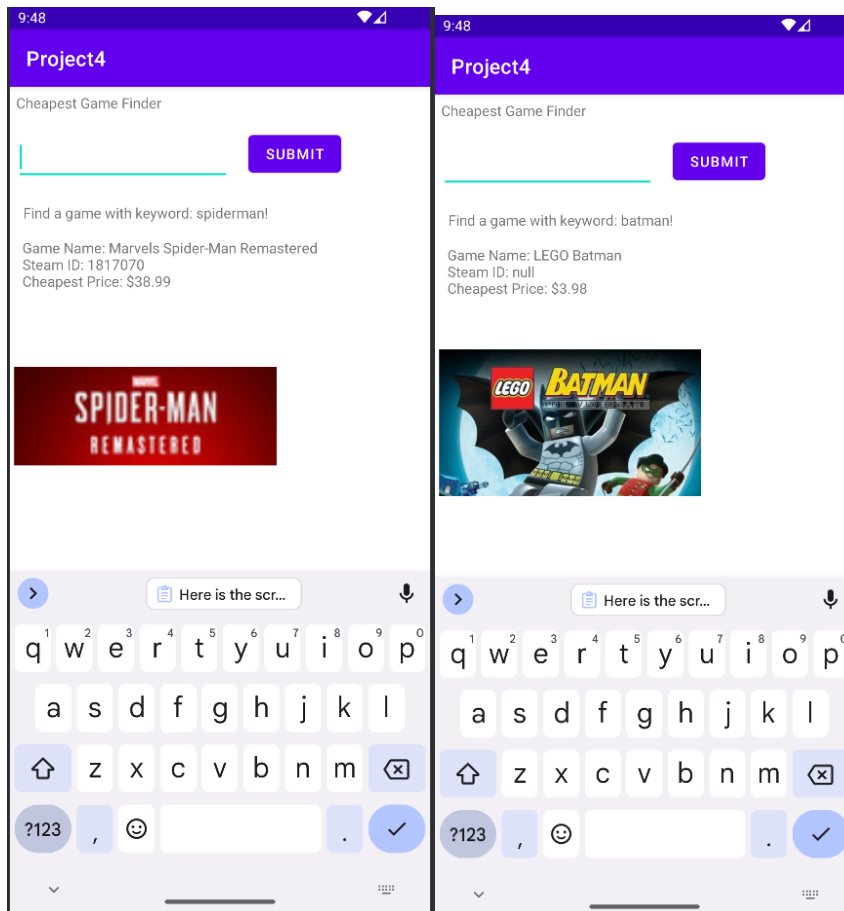
e. Display new information to the users

Here is the screenshot after the response has been returned.



f. Is repeatable (I.e. the user can repeatedly reuse the application without restarting it)

The user can type in another keyword to search. Such as “**Spiderman**”



2. Implement a web service, deployed to GitHub Codespaces

The URL of my web service deployed to Codespaces is: <https://cchen72-automatic-space-train-p95jggxg49frpg5-8080.preview.app.github.dev/>

a. Using an HTTP servlet to implement a simple (can be a single path) API

In my web application project:

Model: CheapestGameModel.java

View: dashboard.jsp

Controller: DashboardServlet.java & CheapestGameAPIServlet.java

b. Receives and HTTP request from a native Android application

CheapestGameAPIServlet.java receives the HTTP GET request with the argument “keyword”.

It will pass it to the model.

c. Executes business logic appropriate to your application

CheapestGameModel.java make an HTTP request to:

“https://www.cheapshark.com/api/1.0/games?&exact=0&limit=1&title=” + keyword

It then parses the JSON response, extracts the needed part, and then sends it back to the Android application.

d. Replies to the Android application with an XML or JSON formatted response

We create a ResponseMessage class to store the needed information and serialize it into JSON and send back to android.

Here is the JSON format of the webapp response to the mobile side:

```
{"gameName":"LEGO  
Batman","cheapestPrice":"3.98","pictureURL":"https://cdn.fanatical.com/production/product/40  
0x225/105f34ca-7757-47ad-953e-7df7f016741e.jpeg"}
```

3. Handle error conditions - Does not need to be documented.

4. Log useful information - Itemize what information you log and why you chose it.

keyword: the searching keyword from users. We use it to generate the Top 5 keywords.

steam_id: the steam id of the game. We use it to store and check the return value. game_name:

the name of the game. We use it to store and check the return value. price: the price of the game.

We use it to generate the statistical analysis of game price.

picture_url: the picture url of the game. We use it to store and check the return value.

status_code: the state code of the request. We use it to monitor the request.

request_time: the time that the server receive the request. We use it to calculate the latency.

response_time: the time that the server reply to the user. We use it to calculate the latency.

5. Store the log information in a database - Give your Atlas connection string with the three shards

mongodb://cchen72:ccf15167031360@ac-jsmb9l6-shard-00-00.bttxfcrf.mongodb.net:27017,ac-jsmb9l6-shard-00-01.bttxfcrf.mongodb.net:27017,ac-jsmb9l6-shard-00-

02.bttxfcrf.mongodb.net:27017/test?w=majority&retryWrites=true&tls=true&authMechanism=SCRAM-SHA-1

6. Display operations analytics and full logs on a web-based dashboard

Cheapest Game Webapp Dashboard

Logs

Keyword	Steam ID	Game Name	Price	Logo URL	Status Code	Request Time	Response Time
batman	null	LEGO Batman	3.98	https://cdn.fanatical.com/production/product/400x225/105f34ca-7757-47ad-953e-7df7f016741e.jpeg	200	Sat Apr 08 06:50:55 UTC 2023	Sat Apr 08 06:50:56 UTC 2023
batman	null	LEGO Batman	3.98	https://cdn.fanatical.com/production/product/400x225/105f34ca-7757-47ad-953e-7df7f016741e.jpeg	200	Sat Apr 08 07:20:58 UTC 2023	Sat Apr 08 07:20:58 UTC 2023
batman	null	LEGO Batman	3.98	https://cdn.fanatical.com/production/product/400x225/105f34ca-7757-47ad-953e-7df7f016741e.jpeg	200	Sat Apr 08 07:20:59 UTC 2023	Sat Apr 08 07:21:00 UTC 2023
batman	null	LEGO Batman	3.98	https://cdn.fanatical.com/production/product/400x225/105f34ca-7757-47ad-953e-7df7f016741e.jpeg	200	Sat Apr 08 07:21:01 UTC 2023	Sat Apr 08 07:21:01 UTC 2023
batman	null	LEGO Batman	3.98	https://cdn.fanatical.com/production/product/400x225/105f34ca-7757-47ad-953e-7df7f016741e.jpeg	200	Sat Apr 08 07:21:02 UTC 2023	Sat Apr 08 07:21:02 UTC 2023
batman	null	LEGO Batman	3.98	https://cdn.fanatical.com/production/product/400x225/105f34ca-7757-47ad-953e-7df7f016741e.jpeg	200	Sat Apr 08 07:21:03 UTC 2023	Sat Apr 08 07:21:03 UTC 2023
batman	null	LEGO Batman	3.98	https://cdn.fanatical.com/production/product/400x225/105f34ca-7757-47ad-953e-7df7f016741e.jpeg	200	Sat Apr 08 07:21:04 UTC 2023	Sat Apr 08 07:21:04 UTC 2023
cat	1154830	Scathe	19.88	https://cdn.cloudflare.steamstatic.com/steam/apps/1154830/capsule_sm_120.jpg?t=1666188173	200	Sat Apr 08 07:21:09 UTC 2023	Sat Apr 08 07:21:09 UTC 2023
dog	635930	DOGO	9.99	https://cdn.cloudflare.steamstatic.com/steam/apps/635930/capsule_sm_120.jpg?t=1573890293	200	Sat Apr 08 07:21:12 UTC 2023	Sat Apr 08 07:21:13 UTC 2023
smile	1233580	Smile	1.99	https://cdn.cloudflare.steamstatic.com/steam/apps/1233580/capsule_sm_120.jpg?t=1582999060	200	Sat Apr 08 07:21:15 UTC 2023	Sat Apr 08 07:21:15 UTC 2023
apple	268320	Grapple	6.99	https://cdn.cloudflare.steamstatic.com/steam/apps/268320/capsule_sm_120.jpg?t=1447359728	200	Sat Apr 08 07:21:18 UTC 2023	Sat Apr 08 07:21:18 UTC 2023
ghost	1877460	Ghost	1.39	https://cdn.cloudflare.steamstatic.com/steam/apps/1877460/capsule_sm_120.jpg?t=1643650358	200	Sat Apr 08 07:21:22 UTC 2023	Sat Apr 08 07:21:22 UTC 2023
pen	1850620	PenBall	3.99	https://cdn.cloudflare.steamstatic.com/steam/apps/1850620/capsule_sm_120.jpg?t=1641306515	200	Sun Apr 09 00:19:22 UTC 2023	Sun Apr 09 00:19:23 UTC 2023
csgo	310390	Advanced Tactics Gold	11.09	https://cdn.cloudflare.steamstatic.com/steam/apps/310390/capsule_sm_120.jpg?t=1574172497	200	Sun Apr 09 00:24:28 UTC 2023	Sun Apr 09 00:24:29 UTC 2023
hollowknight	367520	Hollow Knight	7.49	https://cdn.cloudflare.steamstatic.com/steam/apps/367520/capsule_sm_120.jpg?t=1667006028	200	Sun Apr 09 01:02:47 UTC 2023	Sun Apr 09 01:02:48 UTC 2023
hollowknight	367520	Hollow Knight	7.49	https://cdn.cloudflare.steamstatic.com/steam/apps/367520/capsule_sm_120.jpg?t=1667006028	200	Sun Apr 09 01:02:48 UTC 2023	Sun Apr 09 01:02:48 UTC 2023
batman	null	LEGO Batman	3.98	https://cdn.fanatical.com/production/product/400x225/105f34ca-7757-47ad-953e-7df7f016741e.jpeg	200	Sun Apr 09 01:03:06 UTC 2023	Sun Apr 09 01:03:06 UTC 2023
batman	null	LEGO Batman	3.98	https://cdn.fanatical.com/production/product/400x225/105f34ca-7757-47ad-953e-7df7f016741e.jpeg	200	Sun Apr 09 01:03:06 UTC 2023	Sun Apr 09 01:03:06 UTC 2023
csgo	310390	Advanced Tactics Gold	11.09	https://cdn.cloudflare.steamstatic.com/steam/apps/310390/capsule_sm_120.jpg?t=1574172497	200	Sun Apr 09 01:04:33 UTC 2023	Sun Apr 09 01:04:33 UTC 2023
csgo	310390	Advanced Tactics Gold	11.09	https://cdn.cloudflare.steamstatic.com/steam/apps/310390/capsule_sm_120.jpg?t=1574172497	200	Sun Apr 09 01:04:34 UTC 2023	Sun Apr 09 01:04:34 UTC 2023
hollowknight	367520	Hollow Knight	7.49	https://cdn.cloudflare.steamstatic.com/steam/apps/367520/capsule_sm_120.jpg?t=1667006028	200	Sun Apr 09 01:06:04 UTC 2023	Sun Apr 09 01:06:05 UTC 2023
hollowknight	367520	Hollow Knight	7.49	https://cdn.cloudflare.steamstatic.com/steam/apps/367520/capsule_sm_120.jpg?t=1667006028	200	Sun Apr 09 01:06:05 UTC 2023	Sun Apr 09 01:06:05 UTC 2023
pen	739720	Penkura	13.99	https://cdn.cloudflare.steamstatic.com/steam/apps/739720/capsule_sm_120.jpg?t=1680825942	200	Sun Apr 09 01:40:53 UTC 2023	Sun Apr 09 01:40:54 UTC 2023
hollowknight	367520	Hollow Knight	7.49	https://cdn.cloudflare.steamstatic.com/steam/apps/367520/capsule_sm_120.jpg?t=1667006028	200	Sun Apr 09 01:41:01 UTC 2023	Sun Apr 09 01:41:01 UTC 2023

hollowknight	367520	Hollow Knight	7.49	https://cdn.cloudflare.steamstatic.com/steam/apps/367520/capsule_sm_120.jpg?t=1667006028	200	Sun Apr 09 01:06:05 UTC 2023	Sun Apr 09 01:06:05 UTC 2023
hollowknight	367520	Hollow Knight	7.49	https://cdn.cloudflare.steamstatic.com/steam/apps/367520/capsule_sm_120.jpg?t=1667006028	200	Sun Apr 09 01:06:05 UTC 2023	Sun Apr 09 01:06:05 UTC 2023
pen	739720	Penkura	13.99	https://cdn.cloudflare.steamstatic.com/steam/apps/739720/capsule_sm_120.jpg?t=1680825942	200	Sun Apr 09 01:40:53 UTC 2023	Sun Apr 09 01:40:54 UTC 2023
hollowknight	367520	Hollow Knight	7.49	https://cdn.cloudflare.steamstatic.com/steam/apps/367520/capsule_sm_120.jpg?t=1667006028	200	Sun Apr 09 01:41:01 UTC 2023	Sun Apr 09 01:41:01 UTC 2023
hollowknight	367520	Hollow Knight	7.49	https://cdn.cloudflare.steamstatic.com/steam/apps/367520/capsule_sm_120.jpg?t=1667006028	200	Sun Apr 09 01:42:42 UTC 2023	Sun Apr 09 01:42:42 UTC 2023
hollowknight	367520	Hollow Knight	7.49	https://cdn.cloudflare.steamstatic.com/steam/apps/367520/capsule_sm_120.jpg?t=1667006028	200	Sun Apr 09 01:42:43 UTC 2023	Sun Apr 09 01:42:43 UTC 2023
spiderman	1817070	Marvels Spider-Man Remastered	38.99	https://cdn.cloudflare.steamstatic.com/steam/apps/1817070/capsule_sm_120.jpg?t=1673999865	200	Sun Apr 09 01:48:39 UTC 2023	Sun Apr 09 01:48:39 UTC 2023
spiderman	1817070	Marvels Spider-Man Remastered	38.99	https://cdn.cloudflare.steamstatic.com/steam/apps/1817070/capsule_sm_120.jpg?t=1673999865	200	Sun Apr 09 01:48:40 UTC 2023	Sun Apr 09 01:48:40 UTC 2023
batman	null	LEGO Batman	3.98	https://cdn.fanatical.com/production/product/400x225/105f34ca-7757-47ad-953e-7df7f016741e.jpeg	200	Sun Apr 09 01:48:51 UTC 2023	Sun Apr 09 01:48:52 UTC 2023
batman	null	LEGO Batman	3.98	https://cdn.fanatical.com/production/product/400x225/105f34ca-7757-47ad-953e-7df7f016741e.jpeg	200	Sun Apr 09 01:48:52 UTC 2023	Sun Apr 09 01:48:52 UTC 2023
lego	348360	Doodle God	2.99	https://cdn.cloudflare.steamstatic.com/steam/apps/348360/capsule_sm_120.jpg?t=1649949441	200	Sun Apr 09 01:54:23 UTC 2023	Sun Apr 09 01:54:23 UTC 2023
batman	null	LEGO Batman	3.98	https://cdn.fanatical.com/production/product/400x225/105f34ca-7757-47ad-953e-7df7f016741e.jpeg	200	Sun Apr 09 01:54:36 UTC 2023	Sun Apr 09 01:54:36 UTC 2023

Operation Analytics

Top 5 Searching Keywords		
	Keyword	Times
Top 1	batman	12
Top 2	hollowknight	7
Top 3	csgo	3
Top 4	pen	2
Top 5	spiderman	2

Price Analysis				
Minimum	1st Quantile	Average	3rd Quantile	Maximum
\$1.39	\$3.98	\$8.52	\$9.99	\$38.99

Average Latency For Each Request	
Average Latency	249.81 milliseconds