

Project 4 Task 2 – Currency Converter App

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Description:

My application performs real-time currency conversion by interacting with Fixer API and displays the result to the user. It also logs detailed interactions in MongoDB Atlas for operational analytics, accessible via a web-based dashboard.

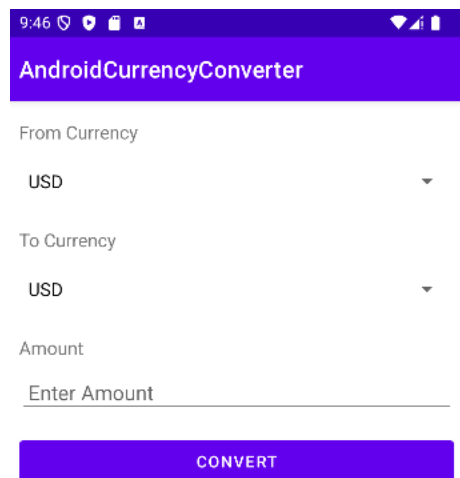
1. Implement a native Android application

The name of my native Android application project in Android Studio is: CurrencyConverter

- a. Has at least three different kinds of Views in your Layout

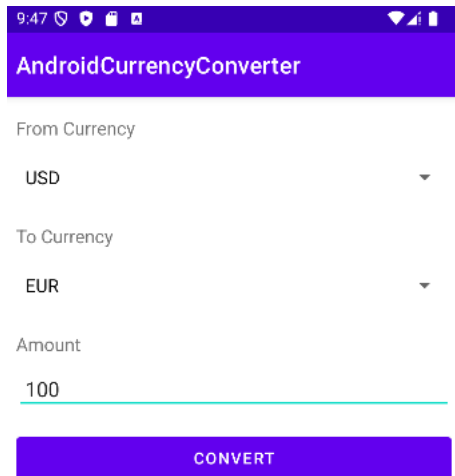
My application uses TextView, EditText, Spinner, and Button. See activity_main.xml for details of how they are incorporated into the LinearLayout.

Here is a screenshot of the layout before the currency conversion is performed.



- b. Requires input from the user

The user enters the amount to convert and selects source and target currencies using dropdown menus. Here is a screenshot of the UI prompting the user for input:



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

The application makes an HTTP GET request to the web service deployed on Codespaces.

For example:

`https://supreme-space-garbanzo-9qpjq7rwpw5fx6w5.github.dev/convertCurrency?from=USD&to=EUR&amount=100`

This request is constructed in the `CurrencyConverter.java` file, where `from`, `to` and `amount` are the user's inputs. The `doGet` method sends this request to the web service, parses the returned JSON to extract the converted amount, and displays the result to the user.

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

An example of the json reply is:

```
{
  "convertedAmount": 94.79346873000452
}
```

- e. Displays new information to the user

Here is a screenshot after the input amount has been converted.

10:12

AndroidCurrencyConverter

From Currency

USD

To Currency

EUR

Amount

100

CONVERT

Converted Amount: 94.80649993363545

Detailed description: This is a screenshot of an Android application titled 'AndroidCurrencyConverter'. The interface has a light blue header bar with the app's name. Below the header, there are three main sections: 'From Currency' with a dropdown menu showing 'USD', 'To Currency' with a dropdown menu showing 'EUR', and 'Amount' with a text input field containing '100'. A blue 'CONVERT' button is positioned below the input field. At the bottom of the screen, the text 'Converted Amount: 94.80649993363545' is displayed. The status bar at the top shows the time as 10:12 and various system icons.

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

The user can select another “from” and “to” currency, input a different amount to be converted and then hit CONVERT.

Here is an example of selecting “EUR” as the “from” currency, “INR” as the “to” currency and 50 as the amount to be converted and then clicking the “CONVERT” button.

10:13

AndroidCurrencyConverter

From Currency

EUR

To Currency

INR

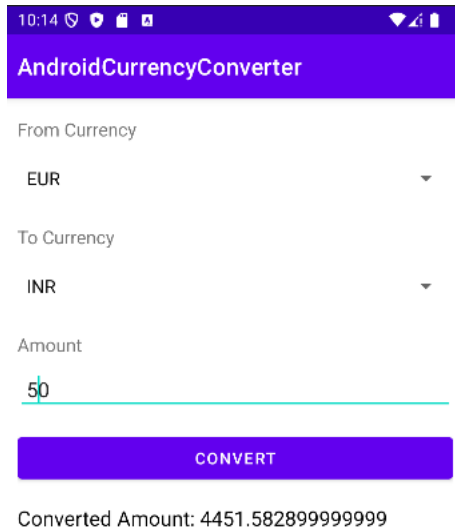
Amount

50

CONVERT

Converted Amount: 94.80649993363545

Detailed description: This is a screenshot of the same Android application, 'AndroidCurrencyConverter', at a later time (10:13). The user has changed the settings: 'From Currency' is now 'EUR', 'To Currency' is now 'INR', and the 'Amount' input field now contains '50'. The blue 'CONVERT' button remains the same. The 'Converted Amount' at the bottom is still '94.80649993363545'. The status bar at the top shows the time as 10:13.



2. Implement a web service

The URL of my web service deployed to Codespaces is:

supreme-space-garbanzo 9qpjq7rwpw5fx6w5

(<https://supreme-space-garbanzo-9qpjq7rwpw5fx6w5-8080.app.github.dev/>)

The Project directory name is:

Project4_CurrencyConverter

- a. Implement a simple (can be a single path) API.

The CurrencyConverterServlet handles requests to /convertCurrency. It interacts with the Fixer API to fetch real-time exchange rates and calculates the converted amount.

- b. Receives an HTTP request from the native Android application

The CurrencyConverterServlet receives GET requests from the Android application with query parameters from, to, and amount.

- c. Executes business logic appropriate to your application. This includes fetching XML or JSON information from some 3rd party API and processing the response.

The servlet makes an HTTP request to the Fixer API, parses the response, and computes the converted amount based on the provided parameters.

It extracts only the converted amount without any additional details to be sent to the Android application.

- d. Replies to the Android application with an XML or JSON formatted response. The schema of the response can be of your own design.

The response to the Android application is in JSON format:

```
{  
  "convertedAmount": 85.43  
}
```

4. Log useful information

The application logs the following details to MongoDB Atlas:

1. **Timestamp:** When the request was received.
2. **User Agent:** Identifies the client making the request.
3. **Source Currency (From):** The currency being converted from.
4. **Target Currency (To):** The currency being converted to.
5. **Amount:** The amount being converted.
6. **Converted Amount:** The resulting converted amount.
7. **Response Time (in ms):** Time taken to process the request.

This information helps monitor service usage and performance.

5. Store the log information in a database

Atlas connection string:

```
mongodb+srv://kiranmayianupindi:Mellon2024@cluster0.vxd92.mongodb.net/?retryWrites=true&w=majority&appName=Cluster0
```

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

Currency Conversion Dashboard							
Analytics							
<ul style="list-style-type: none">Total Requests: 13Average Response Time (ms): 421.84615384615387Most Common Source Currency: USD							
Logs							
Timestamp	User Agent	From	To	Amount	Converted Amount	Response Time (ms)	
2024-11-21T00:30:24.317135900Z	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/131.0.0.0 Safari/537.36 Edg/131.0.0.0	USD	INR	100.0	8439.291649277231	512	
2024-11-21T01:00:11.508481Z	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/131.0.0.0 Safari/537.36 Edg/131.0.0.0	USD	INR	100.0	8439.854218365224	818	
2024-11-21T01:01:01.431406400Z	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/131.0.0.0 Safari/537.36 Edg/131.0.0.0	USD	INR	100.0	8439.851447124622	408	
2024-11-21T01:05:30.291329500Z	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/131.0.0.0 Safari/537.36 Edg/131.0.0.0	USD	INR	100.0	8439.82704299653	1873	
2024-11-21T01:07:55.057134500Z	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/131.0.0.0 Safari/537.36 Edg/131.0.0.0	USD	INR	100.0	8439.825029321384	418	
2024-11-21T01:37:15.033522762Z	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/131.0.0.0 Safari/537.36 Edg/131.0.0.0	USD	INR	100.0	8440.397966274591	320	
2024-11-21T01:37:41.268026084Z	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/131.0.0.0 Safari/537.36 Edg/131.0.0.0	USD	EUR	100.0	94.80353389652953	21	
2024-11-21T01:40:47.772494426Z	Dalvik/2.1.0 (Linux; U; Android 15; sdk_gphone64_x86_64 Build/AE3A.240806.005)	INR	USD	10000.0	118.47782510240846	142	
2024-11-21T03:03:21.595606666Z	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/131.0.0.0 Safari/537.36 Edg/131.0.0.0	USD	EUR	100.0	94.79346873000452	545	
2024-11-21T03:07:54.384840559Z	Dalvik/2.1.0 (Linux; U; Android 15; sdk_gphone64_x86_64 Build/AE3A.240806.005)	USD	EUR	100.0	94.79445717849987	147	
2024-11-21T03:10:26.465362815Z	Dalvik/2.1.0 (Linux; U; Android 15; sdk_gphone64_x86_64 Build/AE3A.240806.005)	USD	INR	100.0	8440.783058229277	202	
2024-11-21T03:12:26.622006464Z	Dalvik/2.1.0 (Linux; U; Android 15; sdk_gphone64_x86_64 Build/AE3A.240806.005)	USD	EUR	100.0	94.80649993363545	54	
2024-11-21T03:14:49.219200391Z	Dalvik/2.1.0 (Linux; U; Android 15; sdk_gphone64_x86_64 Build/AE3A.240806.005)	EUR	INR	50.0	4451.582899999999	24	