Erin Kiesel
CS 499: 5-2 Milestone Four: Enhancement Three: Databases

Artifact Description

The artifact chosen for the Databases category was the Weight Tracking application that was originally developed in CS 360: Mobile architecture in Programming that I took in Fall 2024. The app was a basic weight tracking app that allowed the user to set a goal weight and track their weight over time, with all entries stored locally using a SQLite database. For this enhancement, I added Firebase to handle cloud syncing, made sure both local and cloud data stayed in sync using timestamps, and added the ability for users to export their weight entries to a CSV file.

Justification for Inclusion

This project was selected because it gave me a chance to work with both a local database and a cloud-based one. I wrote the logic to sync entries between SQLite and Firestore, which included handling conflicts when the same entry existed in both places. To solve this, I used timestamps to decide which version to keep. I also built a way to track which entries needed to be synced and marked them as synced after uploading. These updates show I can build useful, real-world database features. The CSV export is another example of that. It lets users save or share their weight history outside of the app, which adds practical value.

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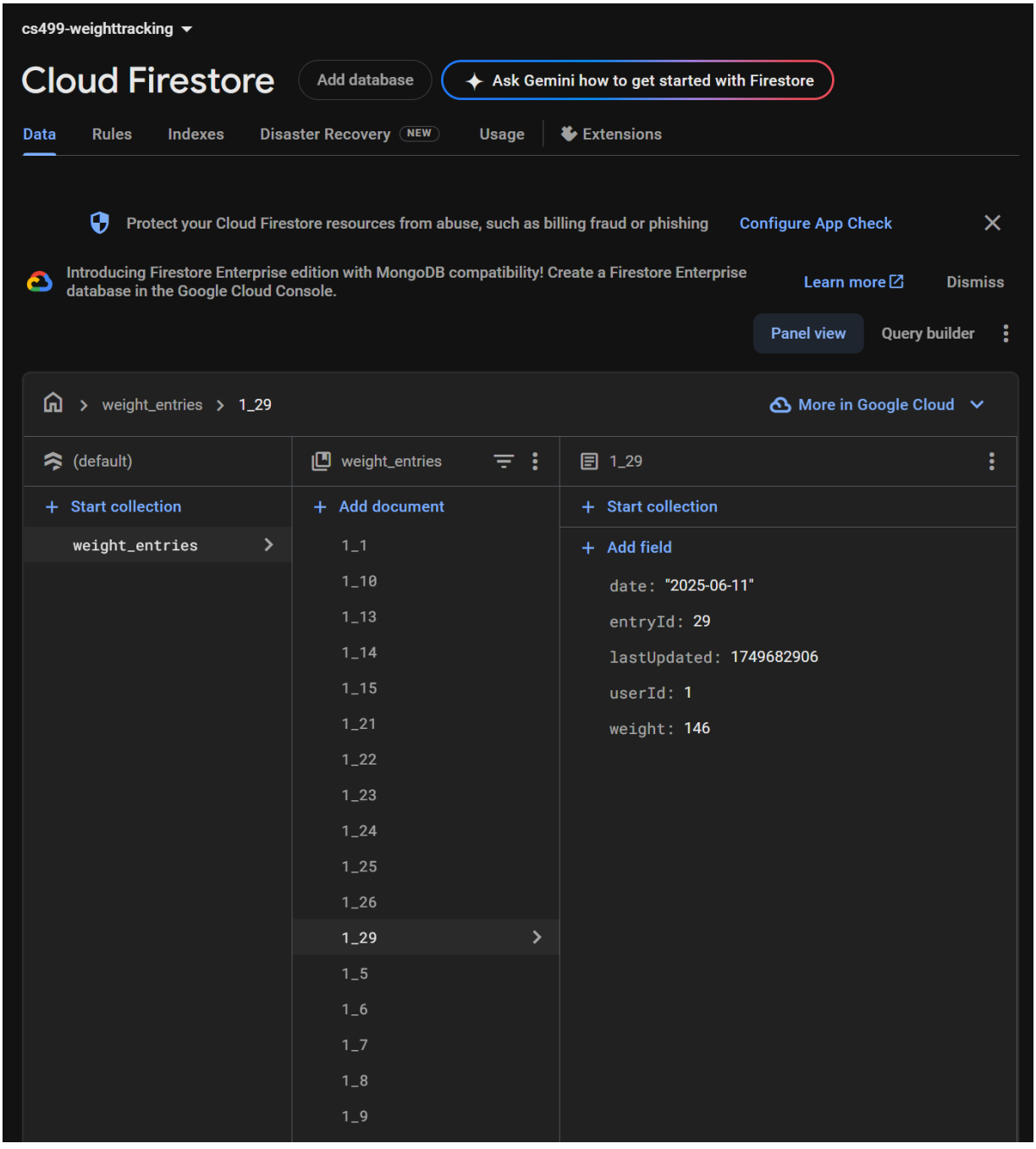
Below you can see a screenshot of the weight entries from my test user's account in the Firestore database:



I tested to make sure that when a new entry is added, it is included in both databases, as well as ensuring any edits or deletions are reflected in both the Firestore and SQLite databases.

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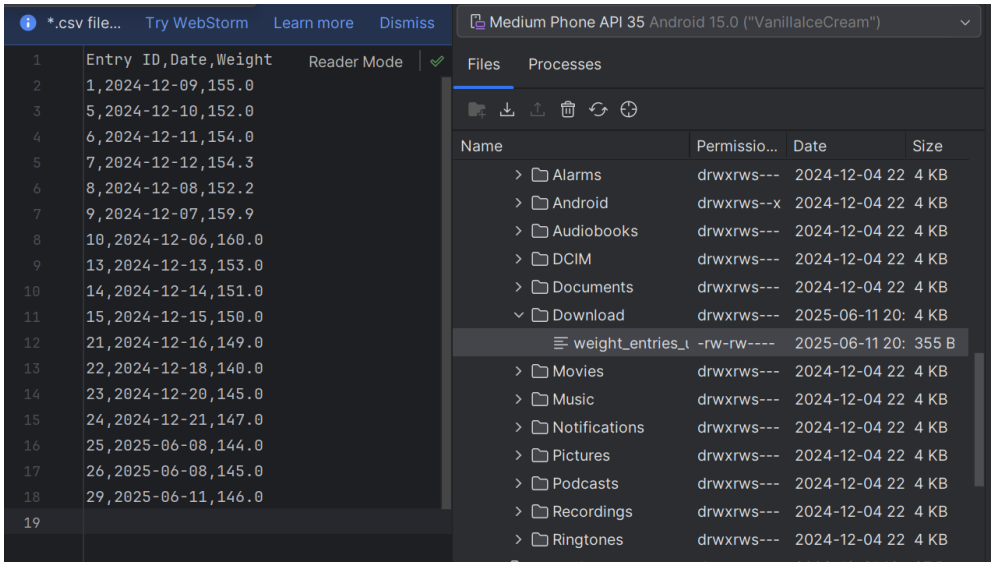
Here you can see a slightly updated home page with an additional button along the bottom to allow a user to export their data as a CSV file:

And here's a look at the CSV file created in the Download folder of the virtual device used for testing:



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Course Outcomes

This enhancement helped me meet several course outcomes. I used solid development techniques to build a working sync system between two databases. I also applied algorithmic thinking by designing the sync logic based on timestamps and conflict resolution. In addition, I made sure the CSV export was reliable and handled the file system correctly. These improvements show that I can implement features that deliver value and solve real problems for users.

Reflection

Adding Firebase was a bit of a struggle for me. It's not something that I've had experience with in any of my classes, other than just reading about it. Once I felt like I had my code implemented for it to work, my application just stopped loading when I was testing it. It wasn't crashing, it was just freezing when I was trying to load it. This caused me to be stuck for quite a while, making a lot of changes and getting nowhere. Eventually I sought help from a friend of mine that has experience with developing apps and he suggested clearing the data from the emulator, and suddenly my application was loading. It was frustrating to discover that I was stuck when there was such an easy solution to my problem that I just hadn't considered. Overall, this enhancement helped me get more comfortable working with different types of databases.