For my final project, I decided to work on my Trip Planner app that I made in my database class last fall. Back then, I only knew how to do basic stuff with SQLite - you know, adding trips, updating them, and deleting them. After learning so much more in my other CS classes, especially in software engineering and cybersecurity, I knew I could make it way better.

I chose this project because when I looked at my old code, I was like "wow, I really didn't know much back then!" During my summer internship, my mentor showed me better ways to handle databases, like using connection pools and making things more secure. My old code was pretty messy - it kept opening new database connections everywhere (which my mentor said was really bad), didn't have any way to handle database updates safely, and honestly wasn't very secure at all. Users couldn't even search their trips properly!

The first thing I fixed was how the app connects to the database. I learned about something called connection pooling in my internship, and even though it was kind of confusing at first (especially the thread safety stuff - that gave me a headache!), I got it working. Now the app runs so much faster! I also organized all the database settings in one place, which makes it easier to fix problems. Before, when something went wrong, the app would just crash, but now it tells you what happened and keeps track of errors in a log file.

I spent a lot of time making everything more secure. My cybersecurity class really opened my eyes - I was shocked when I realized how easy it would be for someone to hack my old database! I added checks to make sure all the data is safe before it goes into the database, fixed how it handles transactions (I learned about ACID in class - it's not just a chemical thing!), and made sure nobody could do SQL injection attacks. I also made the app automatically save backup copies of the database because I accidentally deleted some data while testing... that was scary!

One thing I'm really proud of is the new way the app handles database changes. In my old version, whenever I needed to change how the database was structured, I had to basically start over. Now I have this cool system where I can make changes safely and even undo them if something goes wrong. I really wish I knew about this before - it would have saved me so many late nights trying to fix the database when I messed something up!

The search part is so much better now too. Users can actually search through their trips using regular words (I used full-text search for this), and they can look up trips by dates. I also added categories and tags because I realized people might want to organize their trips better. I learned about database indexes in my advanced database class, and using them made the searches super fast.

Testing was something I totally didn't think about in my first version. Now I have tests for pretty much everything - checking if the database connections work right, making sure the security stuff is doing its job, and testing if searches work correctly. Setting up the tests was kind of a pain at first (I had to watch a bunch of YouTube tutorials), but now I'm so glad I did it because I can change things without worrying about breaking everything.

The hardest part was trying to make everything secure without making it super slow. Every time I added something to make it more secure, the app would get a bit slower. I had to figure out what was worth keeping and what was maybe too much. Some of the SQLite stuff was really confusing too - I probably spent hours just reading Stack Overflow posts trying to figure out how things worked!

When I think about what we learned in class, this project really shows how far I've come. My documentation is actually helpful now (not just random comments), I'm using version control properly (no more copying folders and naming them 'final\_final\_v2'!), and everything is way more organized. I used a lot of the stuff we learned about in our advanced programming classes, like design patterns and SOLID principles.

This whole project taught me so much. My Trip Planner isn't just some basic homework assignment anymore - it's something I can actually show to employers! I learned that making a good database isn't just about storing information . I'm really excited to use what I learned in my future job, and now I actually feel confident that I can handle real-world database projects. My internship supervisor even said my code looks way more professional now!