Name: HUNTER CASILLAS

IS 543 Section 1 Final Exam
Mobile Platform Development, Fall 2019
Dr. Stephen W. Liddle

Instructions: *This exam is open book, open notes, open internet, but "closed neighbor." This means you can search and read anything you'd like, but you can't post messages or communicate to anyone else (except Dr. Liddle) during this exam. The penalty for communicating with others is a score of 0 for the exam. You have three hours to complete this exam. You may not discuss the contents of the exam with anyone except Professor Liddle until after the semester is over. This exam is non-traditional. I have here a list of tasks that is too big for anyone (including me) to accomplish in three hours. Don't be intimidated! Your job is NOT to finish the list of tasks, but rather to spend three hours working on this exam. I will grade your work along several dimensions: quality of tasks you accomplished (user experience, adherence to HIG, etc.), programming technique (code quality, use of good modularity, robustness to failures, use of patterns like MVC, etc.), how much you accomplished, and overall mastery of iOS programming that you demonstrate. I will also attempt to measure and factor in how much you have progressed over the semester as part of the grade. As you accomplish tasks on the list, please check the box next to the task so I'll know to expect that your solution includes that element. Feel free to make other notes on this exam.*

Your task is to write an iOS app that does a small portion of what my Scripture Citation Index app does. I have an SQLite database on my server that you can download and uncompress (you can also download an already-uncompressed version). This is a variation of the database file you used in Project 3, but more comprehensive. Then you can perform queries on the database to display the contents of various elements.

The options below are written assuming you'll use UIKit, but that is not necessary. You could instead choose to do your work in a SwiftUI project. I suggest you read all the options before deciding which ones to work on.

Options for Downloading the Database

You may either download the database manually (and install it into the app bundle for your project) or automatically. If you download it automatically, you may either download the compressed .zip file and automatically uncompress it within the app, or you may download the uncompressed version.

Manual option (easy):

☑ Download the database file using your web browser and install it into the app bundle.

Automatic option (harder):

☐ In order to know what file to download, you need to first retrieve a JSON message from the server, at the following URL: `https://scriptures.byu.edu/is543/sci-core.json`
Its contents look something like this (but it may have updated contents):

```
{ "version": "NN",
  "download-name": "sci-core.NN.zip",
  "download-size": "12306144",
  "download-md5": "98a5fb6b992609736d4a8590cbd448e3",
  "content-name": "core.NN.db",
  "content-size": "39211008",
  "content-md5": "f44ac4aa3ee1fe32c7cf7bd44687ee6f" }
```

Note that the contents of `sci-core.json` may change, so don't hard-code the values. I'll guarantee that the keys will remain the same, but the values may change.

- ☐ If after retrieving the `sci-core.json` message, you discover that the user has already downloaded the database file (and it matches the JSON message), then skip the next steps automatically. (So when the user starts your app the next time they don't have to download again.)
- ☐ The URL of the file to download is `https://scriptures.byu.edu/is543/` with the download-name field's value appended on the end (e.g., `https://scriptures.byu.edu/is543/sci-core.NN.zip` in the example above). Write the downloaded file into the `Document` directory. Or you may choose instead to download the `core.NN.db` file so you don't have to uncompress it.
- ☐ While downloading the large database, display a progress bar (`UIProgressView`) that shows the file transfer progress as it downloads. (**Warning:** this might be harder than it sounds at first.)

Uncompress Option:

- ☐ When the download is complete, extract the contents of the zip file to the `Document` directory. When the extraction is complete, delete the zip file, leaving only the content file in the `Document` directory. You might find this third-party library helpful:
  - SSZipArchive (`https://github.com/soffes/ssziparchive`). There are others out there too.

Data Display Options

For this part, you are welcome (but not required) to use the GRDB SQLite wrapper we used in a couple of the projects this semester. There are other options that would also work well.

Simple option:

- ☐ Demonstrate that you can query the database by performing the following query and show its result somewhere in the app's UI:

```
SELECT last_updated FROM updated;
```

More intricate options:

- ☑ Display a list of general conferences in a table view controller. You can get the list of conferences as follows:

```
SELECT ID, Abbr FROM conference ORDER BY IssueDate DESC;
```

- ☑ When the user taps a conference in the list, display another table view controller MVC that displays the talks for that conference. This query finds talks for conference ID 145:

```
SELECT t.ID, t.Title, s.Description
FROM talk t JOIN conference_talk c JOIN conf_session s
WHERE t.ID=c.TalkID AND c.SessionID=s.ID AND s.ConferenceID=145
ORDER BY s.Sequence, c.Sequence;
```

  - ☐ Option: List the talks for each session in a separate section of the table view.
  - ☐ Option: Display headers for each of the sections, describing the session (this information comes from the `conf_session` table referenced above, in the `s.Description` field).
  - ☐ Option: instead of just displaying a talk title in the table view, also display the speaker's name (you'll need to join the query above to the speaker table where you can look up `GivenNames` and `LastNames`).

- [x] When the user taps a talk in the list, display another MVC that shows the contents of the talk. You should display content in a web view. The URL for loading a conference talk from scriptures.byu.edu is `https://scriptures.byu.edu/content/talks_ajax/NNNN` where *NNNN* is the talk ID from the database. The URL for loading it from ChurchOfJesusChrist.org is found in the `talk` table's `URL` field.

User Interface Options

- [ ] Implement your interface on the iPhone (only).
- [ ] Implement your interface on the iPad (only).
- [x] Write a universal app that supports iPhone and iPad.
- [x] Support autorotation for all MVCs.
- [x] Place the data-display MVCs into a split view controller (or a navigation view if you're doing SwiftUI). Put most of the MVCs into the master view controller. But when the user asks to display a conference talk, show it in the detail view controller.
- [ ] Add an app icon to your app (you can copy it from the web if you want, but if so, tell me where it came from).
- [x] Design a *custom* app icon and install it in your app. It should be thematically related to the functionality of the app and should be original artwork, not something copied from the web.
- [ ] Ignore all the specifications I've given you and *design* the ultimate general conference app from the ground up. On paper, sketch the UI clearly enough for a programmer to work from your sketches to prototype the app.
- [ ] In Xcode, implement the storyboard you created in the previous step.

Other Options

- [ ] Maybe you will think of something else I didn't list that you feel would be a good addition to your final exam project. If so, tell me what you did. You could even choose to do something entirely different than this app to demonstrate to me your iOS development skills.

When you're done, rename your top-level folder "Final Exam Lastname Firstname", then zip up your final-exam folder and upload the zip to Learning Suite. If you installed the database into your app bundle, delete it before zipping up the project. I can add it myself when I grade your exam.

Grade Survey

(*this is not part of the timed exam*)

Circle the most accurate answers.

How hard did you work in IS 543?	(A)	A-	B+	B	B- or lower
How much did you learn in IS 543?	(A)	A-	B+	B	B- or lower
What was your iOS/Swift skill level before taking IS 543?	A	A-	(B+)	B	B- or lower
What is your iOS/Swift skill level after taking IS 543?	(A)	A-	B+	B	B- or lower
How helpful have you been to other students in IS 543?	A	A-	B+	(B)	B- or lower
How do you feel you rank compared to your peers?	(A)	A-	B+	B	B- or lower
How do you feel you did on homework and projects?	(A)	A-	B+	B	B- or lower
How do you feel you did on the midterm?	A	(A-)	B+	B	B- or lower
How do you feel you did on the final exam?	(A)	A-	B+	B	B- or lower
Overall, what letter grade do you feel you've earned in the class?	(A)	A-	B+	B	B- or lower

If you think there is additional evidence I need to consider as I calculate your grade for the class, please share that information with me:

IS 543 WAS MY FAVORITE CLASS I'VE EVER TAKEN AT BYU. IT WAS INTERESTING, FUN, CHALLENGING, AND TAUGHT ME MORE THAN MOST CLASSES HAVE IN THE PAST. I LOVED iOS DEVELOPMENT AND MIGHT WANT TO CONSIDER A CAREER IN IT. ALTHOUGH I WASN'T ABLE TO MAKE IT TO EVERY EARLY MORNING CLASS, I MADE SURE TO WATCH THE LECTURES I MISSED. THANK YOU FOR A WONDERFUL SEMESTER PROFESSOR LIDDLE!

Merry Christmas!