Lab 5: GradebookV1

Overview

In this lab you will start implementing a basic, single-threaded, read-only interface to the course gradebook. The data you will be displaying is your actual score data for this course and previous courses you may or may not have taken from me. You will get more experience implementing UIKit-based user interfaces involving the navigation view controller and list view controllers. This is an individual lab.

Accessing the Gradebook Data

The gradebook data is accessible via a JSON interface. JSON is a standard format for transferring data within an HTTP connection. See the JSON API specification available from the course web site for the details on gradebook's API. The URL to use for the JSON application this quarter is

https://users.csc.calpoly.edu/~bellardo/cgi-bin/grades.json

I strongly encourage you to load the pages manually via a web browser early in the development process.

The JSON application requires both https access and authenticating with your CSL credentials. This prevents you from seeing other student's scores and enrollment information. I have provided code to assist you with this process. One the course web site is an extension to NSString objects that performs base64 encoding. Using that extension the correct authentication header can be created with the following code:

```
- (NSString*) authenticationHeader: (NSString*)username
                         password:(NSString*)password
{
    NSString *loginString = [NSString
                    stringWithFormat:@"%@:%@", username, password];
    return [NSString stringWithFormat:@"Basic %@",
                            [loginString base64Encode]];
}
```

Remember to include the "NSString+Base64Encoding.h" header file, otherwise you will not be able to call the `base64Encode` method.

Loading HTTPS Data

iOS provides a simple wrapper class for loading http and https data. The name of the class is NSURLConnection (read it's class reference). The following general steps will quickly download the contents of the JSON application:

1. Build the URL you wish to load using NSURL's `+ (id)URLWithString:(NSString *)URLString` method.
2. Create a NSMutableURLRequest via the `+ (id)requestWithURL:(NSURL *)URL cachePolicy:(NSURLRequestCachePolicy)cachePolicy timeoutInterval:(NSTimeInterval)timeoutInterval` method. Use the `NSURLRequestReloadIgnoringLocalCacheData` cache policy to always load the freshest version of the data.
3. Add an "Authorization" header to the NSMutableURLRequest using the `- (void)addValue:(NSString *)value forHTTPHeaderField:(NSString *)field` method. The header's value should be the username / password hash described in the previous section.
4. Use NSURLConnection's `+ (NSData *)sendSynchronousRequest:(NSURLRequest *)request returningResponse:(NSURLResponse **)response error:(NSError **)error` method to load the data (NSData object).

Parsing JSON

Since JSON is an industry standard there are a number of 3rd-party libraries available to convert the ASCII-encoded JSON objects into a property list. I recommend (but don't require) using JSONKit. It is available on the course web site as well as through Google. There are two files to download - JSONKit.h and JSONKit.m. Assuming you have already loaded the JSON output into a NSData object (see previous section), you can convert that into a property list in two steps::

1. Allocate a new JSONDecoder object with the `+ (id)decoder` method.
2. Use the `- (id)objectWithData:(NSData *)jsonData error:(NSError **)error` method to parse the data..

Lab 5 User Interface Design

Implement the following user interface for your lab 5 gradebook app:

1. Make a UINavigationController-based drill-down interface.
2. The root view should be a list of sections.
3. Selecting a section should take you to a list of enrollments.
4. Selecting an enrollment should take you to a list of assignments.
5. Selecting an assignment should take you to a list of scores. The scores list must be sorted so the score that counts is on the top. Each row must show the display_score, and may display more information at your discretion.

6. Provide a way (I recommend a setting as they are the quickest to implement) to change the username, password, and JSON base URL without recompiling the app.

Deliverables

You must demonstrate this lab to either myself or the TA. The last day for the demonstration is Wednesday 5/25. You can demo during regularly scheduled lab time (either section, depending on machine availability) or regularly scheduled office hours. I will not do drop-in demos outside of office hour time. I expect the majority of demos to be done during lab.

Grading Rubric

This is what you will be asked to demonstrate and the associated lab score. I strongly encourage you to test these yourself before you demo!

Points	Requirement(s)
0%	✱ Any code that leaks any amount of memory during any test or doesn't get 70% or more. All tests must conclude with turning the device sideways. You must use the latest version of MemoryHound available from the Lab 3 additional downloads.
70%	✱ App provides a way to change settings mentioned above without recompilation. Section list loads and displays correctly.
80%	✱ All of the above ✱ Selecting a row in the section list causes the enrollment list to slide in and display correctly.
90%	✱ All of the above ✱ Selecting a row in the enrollment list causes the assignment list to slide in and display correctly.
100%	✱ All of the above ✱ Selecting a row in the assignment list causes the scores list to slide in and display correctly.