Design Commentary

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Summary

The objective of this document is to help understand the decisions taken during the development of the project. The different sections will include decisions on the software used and a brief description of each Configuration Item (CIs from now on). The sources used to reach every decision will also be included in the final section. This document will only address the decisions made, but not go into much detail, since every function has a comprehensive JavaDoc-style[1] description.

Decisions breakdown

Software Tools

The Software Tools used for the project have been the following:

- ***Visual Studio Code:*** Editor used for the code, since it works well with any programming language, much like Notepad++. However, *VS Code* also includes some debugging tools for JavaScript and warns you about syntax errors while writing the code. Another reason was that it includes a *GitHub* plugin to be able to commit your changes straight from the IDE.
- ***GitHub:*** For the above-mentioned reason, it was the *Version Control System* used. For the sake of anonymity, the *GitHub* repository will not be provided in this document, but it shall be sent upon request after the grades are returned.
- ***Mozilla Firefox + XAMPP:*** *Firefox* was the chosen web browser for the project. The reason for this will be addressed under the "Additional Information" section.

Configuration Items

A brief explanation of the decisions taken for every CI in the project:

- ***groupApplicationService.js:***
  - The function *changeGroupsOnStudentChange()* is in this *Application Service* rather than the *DAO* because it doesn't modify anything permanently, just local data.
- ***groupTransfer.js:***
  - No comments.
- ***index.html:***
  - Includes some Bootstrap[2] and FontAwesome[3] features, but it's quite a simple and straightforward website with 2 button redirections.
- ***JSON_Database.js:***
  - A simple database only used for Task 1, which is separated from Tasks 2, 3 and 4.
- ***moduleDAO.js:***
  - *sendAJAXPostRequest(contents)* has been created based on a StackOverflow post[6] and also includes some debugging functionalities extracted from the provided service.[7]
  - *uploadAllData()* merges the objects into a single one using JQuery[4][8].
- ***moduleTransfer.js:***
  - No comments.
- ***serverRequestHandlerDAO.php:***

    - As a DAO object, it accesses the remote service and separates this concern from the view and data processing. It used to throw an exception[9] but it was later decided to check the data before sending the request to the server. Although one StackOverflow user answered my question suggesting using CURL instead, the final decision was to check the user input to avoid an overly complicated project.
    - One bug on the online service[10] was also found, in the example here linked, the requested module is "5com3456", however, the service returns the name as "6com3456". This doesn't affect the behaviour of the software, but may cause confusion.
- ***showStudentList.php:***
    - This is by far the most complex CI (since it includes Tasks 2, 3 and 4) and the one that acts as a link between most of the other components. It includes Bootstrap[2], JQuery[4], FontAwesome[3] and Bootstrap-Select[5]. It uses PHP to implement the *get_module_students()* function and make it invisible to the users, to avoid unwanted GET requests to the service by hiding the server address, since PHP is a server-side language.
- ***studentApplicationService.js:***
    - No comments.
- ***studentDisplayFromJSON.html:***
    - This separates Task 1 from the others. This website uses the same functions as the others, but is way simpler.
- ***studentDisplayFromService.php:***
    - This is separated from *showStudentList.php* to make the website look cleaner and load a fresh one to display everything. It also includes the user input parameters in the URL.
- ***studentTransfer.js:***
    - studentChanges could have been implemented as a HashMap rather than an Array. However, it stayed as an array for the sake of simplicity. The advantages of the HashMap would have been a loading time for the table with the toggle on (displaying the old groups) of O(n) rather than the current $O(n^2)$, since a HashMap searches elements in a O(1) time and the searching function for the unordered array uses a O(n) time. Sorting the array could make this a O(log n) time, but again, this would only be noticeable in very large collections of students, therefore not being implemented here.[11]
- ***style-index.css:***
    - No comments.
- ***style-JSON.css:***
    - No comments.
- ***style-service.css:***
    - No comments.
- ***viewFactory.js:***
    - No comments.
- ***viewFrontController.js:***
    - No comments.

Other decisions

The project makes use of several Java design patterns adapted to JavaScript to make the code easier to understand, debug, maintain and extend, such as:

- ***Transfer***[12] used as a temporary local storage solution as well as a way for layers to interact.
- ***Data Access Object (DAO)***[13]

- ***Application Service***[14]
- ***Model-View-Controller architecture***[15]***:*** *Adapted to Integration (DAO), Business (Transfers & Application Service) and Presentation (ViewFactory and ViewFrontController) layers.*
- ***Factory***[16]
- ***Front Controller***[17] adapter as a View Manager

Design decisions

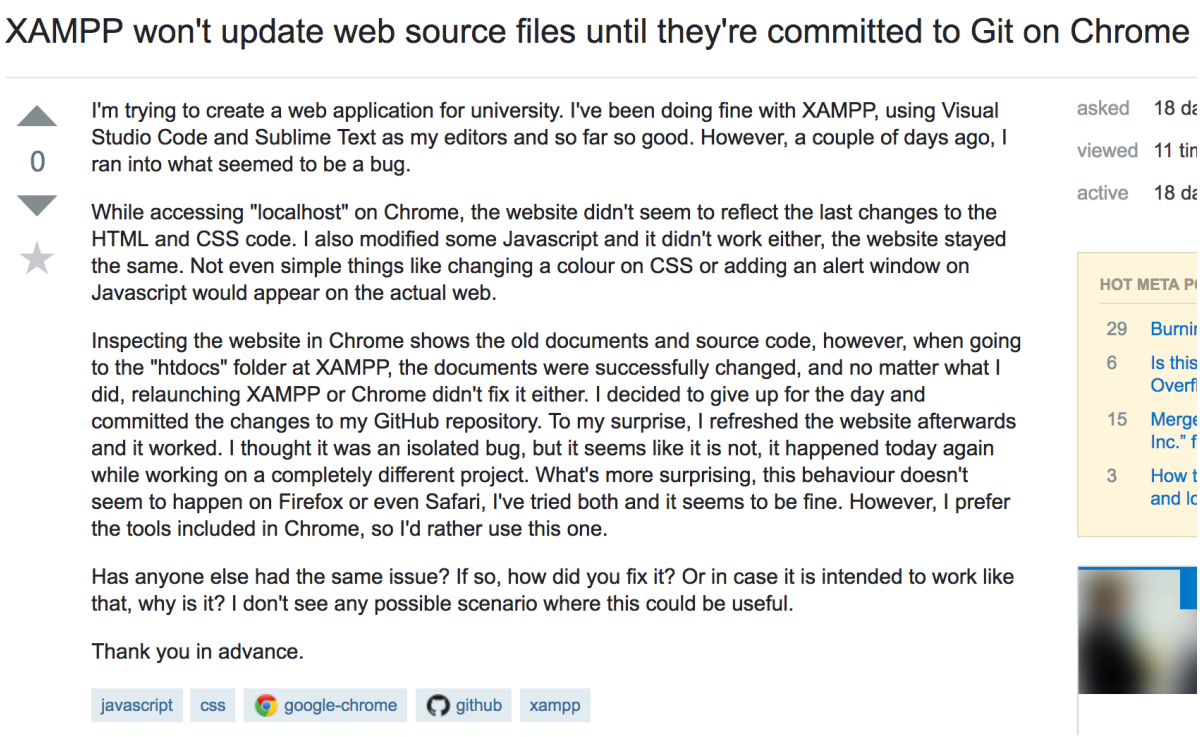
Although the project uses Bootstrap and other such utilities to make the website look more appealing, it is mostly focused on the scripting aspect of the web, therefore, the table is a simple HTML element and doesn't include any complex styles (although they could certainly be added by modifying the *viewFactory.js* document as well as the CSS documents). However, it includes some utilities, such as a search box on the dropdown lists to change student groups.

Some other features could have been added, such as adding side margins (removed by Bootstrap by default unless otherwise stated), column based design or only displaying a certain number of rows for the table. Finally, these were not implemented due to lack of time or complicating the design more than desired.

Additional information

Reason for using Firefox rather than Chrome

After having some issues with Chrome, I opted to post the following question on StackOverflow:



XAMPP won't update web source files until they're committed to Git on Chrome

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I'm trying to create a web application for university. I've been doing fine with XAMPP, using Visual Studio Code and Sublime Text as my editors and so far so good. However, a couple of days ago, I ran into what seemed to be a bug.

While accessing "localhost" on Chrome, the website didn't seem to reflect the last changes to the HTML and CSS code. I also modified some Javascript and it didn't work either, the website stayed the same. Not even simple things like changing a colour on CSS or adding an alert window on Javascript would appear on the actual web.

Inspecting the website in Chrome shows the old documents and source code, however, when going to the "htdocs" folder at XAMPP, the documents were successfully changed, and no matter what I did, relaunching XAMPP or Chrome didn't fix it either. I decided to give up for the day and committed the changes to my GitHub repository. To my surprise, I refreshed the website afterwards and it worked. I thought it was an isolated bug, but it seems like it is not, it happened today again while working on a completely different project. What's more surprising, this behaviour doesn't seem to happen on Firefox or even Safari, I've tried both and it seems to be fine. However, I prefer the tools included in Chrome, so I'd rather use this one.

Has anyone else had the same issue? If so, how did you fix it? Or in case it is intended to work like that, why is it? I don't see any possible scenario where this could be useful.

Thank you in advance.

javascript css google-chrome github xampp

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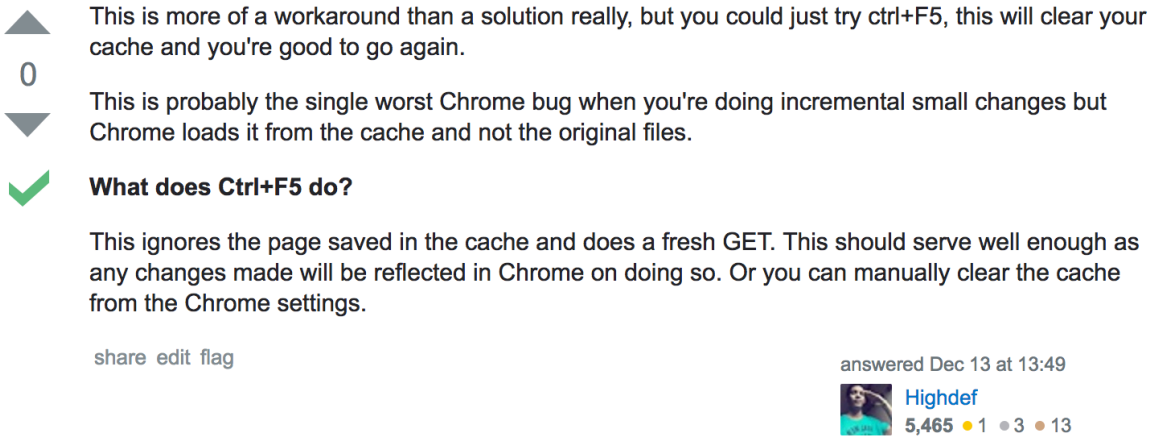
I received the following answer with a workaround to avoid this issue from happening:



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This is more of a workaround than a solution really, but you could just try ctrl+F5, this will clear your cache and you're good to go again.

This is probably the single worst Chrome bug when you're doing incremental small changes but Chrome loads it from the cache and not the original files.

What does Ctrl+F5 do?

This ignores the page saved in the cache and does a fresh GET. This should serve well enough as any changes made will be reflected in Chrome on doing so. Or you can manually clear the cache from the Chrome settings.

share edit flag

answered Dec 13 at 13:49

Highdef

5,465 ● 1 ● 3 ● 13

However, some other users pointed out that switching to *Firefox* would solve the problem, hence my decision on using this web browser.

** This section includes screenshots rather than an URL to the post for anonymity purposes.*

Sources mentioned

[1] http://www.oracle.com/technetwork/articles/java/index-137868.html

[2] https://getbootstrap.com/docs/3.3/

[3] http://fontawesome.io/icons/

[4] https://stackoverflow.com/questions/17941749/bootstrap-select-not-working (JQuery is needed to easily merge objects[8] and make Bootstrap-Select[5] work).

[5] http://silviomoreto.github.io/bootstrap-select/

[6] https://stackoverflow.com/questions/692196/post-request-javascript

[7] http://homepages.herts.ac.uk/~comqgrs/ads/moduleGroupUpdatesServiceTest.html

[8] https://stackoverflow.com/questions/28690708/how-can-i-merge-2-object-in-javascript/28690738#28690738

[9] https://stackoverflow.com/questions/47841571/use-try-catch-finally-block-in-javascript-to-capture-json-parsing-exception-does

[10]http://homepages.herts.ac.uk/%7Ecomqgrs/ads/moduleGroups.php?moduleCode=5com3456

[11] https://stackoverflow.com/questions/7057430/treemap-or-hashmap-faster

[12] http://www.corej2eepatterns.com/TransferObject.htm

[13] http://www.corej2eepatterns.com/DataAccessObject.htm

[14] http://www.corej2eepatterns.com/ApplicationService.htm

[15] http://java-design-patterns.com/patterns/model-view-controller/

[16] https://en.wikipedia.org/wiki/Factory_method_pattern

[17] http://www.corej2eepatterns.com/FrontController.htm

Other sources consulted

- https://stackoverflow.com/questions/503093/how-to-redirect-to-another-webpage
- https://stackoverflow.com/questions/5005960/xmlhttprequest-status-0-responsetext-is-empty
- https://stackoverflow.com/questions/3076414/ways-to-circumvent-the-same-origin-policy
- https://stackoverflow.com/questions/19163417/javascript-xml-cross-domain-mess-how-to-go-around
- https://stackoverflow.com/questions/9156176/what-is-the-difference-between-throw-new-error-and-throw-someobject
- https://stackoverflow.com/questions/23066856/console-log-console-dir-showing-last-state-of-object-not-current
- https://stackoverflow.com/questions/11057802/add-new-element-to-an-existing-object
- https://es.wikipedia.org/wiki/AJAX
- https://en.wikipedia.org/wiki/JSONP
- http://www.openjs.com/articles/ajax_xmlhttp_using_post.php
- https://stackoverflow.com/questions/692196/post-request-javascript
- https://stackoverflow.com/questions/36945348/how-to-make-post-request-using-javascript
- https://stackoverflow.com/questions/1917576/how-to-pass-javascript-variables-to-php
- https://stackoverflow.com/questions/5647461/how-do-i-send-a-post-request-with-php
- https://www.html5rocks.com/en/tutorials/cors/
- https://stackoverflow.com/questions/298745/how-do-i-send-a-cross-domain-post-request-via-javascript
- https://www.w3schools.com/bootstrap/bootstrap_buttons.asp
- https://www.w3schools.com/js/js_object_definition.asp