**September 12, 2012**

I haven't done anything toward my project proposal [form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29) yet. Before I can start on anything more, I'll need to complete this first step.

**September 14, 2012**

Wrote up the project proposal [form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29) for a foreign language - based educational game for my sister, a student at Chester University who wants to learn the basics for a variety of languages.

**September 21, 2012**

Had the initial interview with the end user, Natasha, where we discussed her current [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method) of learning the languages, and established what she expects from both the game and the learning experience it gives.

**September 26, 2012**

Started writing the requirements list based on the results from the interview. I added a few more categories which need to be fleshed out and approved further down the line.

**October 1, 2012**

Finished the list of requirements in the game and have sent it to Natasha to confirm her approval. This list focussed mainly around the words and topics covered, as well as the interface and nature of the games themselves.

**October 3, 2012**

In Flash, I've created Actionscript [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es for each main topic or category in which the word lists will be stored. These will allow storage of the word lists in a structure based on their corresponding categories and subcategories.

**October 8, 2012**

Flattened the category structure to make a simpler "language - category - subcategory - word lists" structure, simplifying the usability of the wordlist [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es. I've started work on compiling the list of English words, to which I'll be able to refer when I look up their translations.

**October 17, 2012**

I started writing all of the customisable options for each game type, aiming to have five different kinds. Decided upon the 9 countries about which the user will learn, and experimented with a background comprising of all the flags.

**December 26, 2012**

Worked on writing the [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method)s and organizing the properties of the Game [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class), with the possibility of splitting it up into separate [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es.

**January 3, 2012**

Wrote the Game [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class), then created a sample program to test its usability in order to highlight areas in need of improvement, as well as general [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)ality.

**January 17, 2013**

Began work on the Flash Cards game, creating simple UI based around the output and input textboxes, a submission button and intructions. This worked, mostly, but I have encountered a problem where the textboxes only show a selection of characters, rather than the whole lot.

**January 23, 2013**

Fixed the issue where I sometimes can't access the .fla, .as and .swf files through flash. This can be overcome by working on the files which have been copied and are now primarily stored on a USB stick. This will also remove the need for constant copying and updating between my files at home, and my files at college.

Decided to write up a To Do List, in order to determine which jobs have priority during the development process. First item on the list was to flesh out the [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es, which I have done today. [Second](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29)ly, I checked to see if the [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function) properly, starting with the Game [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class), which utilizes other [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es within it.

By getting further involved with the [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)ality, I edited the [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class) to accompany for needed changes. Specifically, I moved the score-related properties and calculation [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method) and turned them into a Score [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class), which I have instantiated within the Game [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class). However, since the scoreCalculation [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method) uses properties from the game, I have added parameters to allow for data communication between the [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es.

I also added comments to clarify the processes, as well as error checking conditional statements.

Upon writing code for the score calculation, specifically the time bonus, I realized I needed to create a timer in the code to keep track of the play time. I researched the [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class) and tested it out in another file, in order to understand how to use it in the main game.

**January 28, 2013**

Went back tot he Game [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class) and [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class) Tester file in order to complete the game interaction [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method)s and algorithms. My aim is to allow the instantiated game's language, difficulty and category to be set dynamically. But before I can do that, I need to make sure that the [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method)s [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function) with given values, to test their base [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)ality - returning words when receiving category, language and difficulty settings.

Designed and wrote the Translate [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method) for the Game [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class), which searches for the location of an input word, saves that location, then finds the word in the same location of another language. This has yet to be tested, as it uses variable settings.

I ended the session trying to write a one-off [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method) for setting the wordlist based on the input Language, Difficulty and Category, getting rid of superfluous publicly called [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method)s.

**January 30, 2013**

I finished off writing the settingsTo [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method), which takes a language, a category and a difficulty string as arguments, and in turn allocates the corresponding wordlist to the currentWordList [array](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Array+Processor) variable. This means that, once the user has chosen their settings (giving values to the chosenLanguage, chosenCategory and chosenDifficulty properties) one call to a single [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method) will get the wordlist for the upcoming game prepared and ready to go.

Replaced the "alphabet" category, and replaced it with "pronouns".

Made a coder-friendly language-building [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method) which removes similar superfluous [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method) calls.

I wrote the easy, medium and hard words for English common nouns. I realized that in writing the foreign translations for each word, I can easily copy the english list of words, paste them into google translate, and paste back the similarly [form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29)atted translation. This may not be as accurate as looking up specific translations for each word, but given that there are nine languages to cover I think this is an efficient use of time.

Tested the Translate [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method). I redesigned it to save the indexes of the category, difficulty and word in which the input word is placed in the input language. The [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method) then uses the saved indexes in the output language, to find the output word.

Began work on testing all of the categories in a [translator](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Translator), complete with interacting UI.

**January 31, 2013**

Finished the [translator](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Translator), along with working UI: input boxes, dynamic output textboxes and combo boxes. I found a bug which returned the wrong translation in the translateWord [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method), but resolved it by discovering that the Spanish word was placed twice in the Spanish Database.

**February 1, 2013**

Combined the [translator](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Translator) with the Flash Card Game test I did a few weeks ago. The [form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29)er handles the translation using the settings and all of the separate [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es, while the latter had the same UI and gameplay algorithms. I successfully fused the two interfaces and bodies of code, to create a working Flash Cards game. This is a great step towards implementing it into the main game program. All that is need for the other game types is to polymorph the submitAnswer [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method), and that is the bulk of the work done!

In line with proper ActionScript coding, I also put as much as the code from the .fla file as I could into a separate [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class), which I have called LanguageGameHandler. This [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class) contains all of the general [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)s and variables otherwise used in the .fla. By making the transfer from frame-placed code to [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)-placed code, the code is much easier to use, and won't be repeated in the different UI frames of the main project file. And although the UI handlers and Event Listeners will remain in the frame code, there is very little involved, making it very easy to read and understand.

**February 6, 2013**

Finished off converting the Flash Cards game to work with an overarcing [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class) handler.

Added comments and uses auto-[form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29)at to improve the code's appearance.

**February 7, 2013**

Added the code from the standalone Flash Cards file to the main Game file.

Added a round counter, as well as a label beneath the game title reminding the player of the language they have chosen

Replaced Flash's default input textbox with my own, given a unique UI which all fit the same color scheme. Initially, this custom Input box caused problems, since the space button, which submits the answer, would also type into the box, ruining the succeeding answer. This was fixed by making the textbox single-line.

Added indicators for an answer being correct, and gave them smooth fade in and fade out transitions.

**February 8, 2013**

On top of the indicators, I added correct and incorrect messages, as well as what the answer should have been, were they wrong.

Added a score counter, which displays their current score based on how well they have answered the question.

Moved the chosenLanguage to the LanguageGameHandler [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class), so that it doesn't require a game to be defined in order for it to be set.

Added Frame transitions, so that the screen transitions stylishly between screens when choosing the language, game and settings.

Randomized the words in the game.

Met up with Natasha to touch base with the game. I showed her how the program is coming along, with very positive feedback. As it was known that what she was seeing was not the finished project, there was little constructive feedback, but she has requested a few changes:

* Remove Chinese, Russian, Hindi and Arabic
* Add Portuguese, Finnish, Turkish and Dutch

These changes are problem at all, as at the current stage, these languages haven't yet been developed. So far, I have only worked on the nouns for the Spanish language, as that is enough to sufficiently test the code for the time being.

**February 9, 2013**

I came across a bug where the "incorrect answer" UI wasn't appearing, and an error for applying a null type came up whenever a wrong answer was used. After using the debugger, the software told me that the error was in the line where I assigned the expected answer to a label - where the UI would tell the player the correct answer, were they wrong. I looked through the program, and discovered that I was trying to access the label *after* it had been removed from the stage during its fading animation. Whereas, for other UI, I would reset the internal playhead to a frame where the label existed, in this symbol the label had been removed. My resetting the playhead *before* the code accessed the label, it was therefore able to access it, and the error was fixed.

I began working on a scoring system, applying the previously written calculateScore [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method) to the game. This went well, and is now working. No bugs. Whoo!

Added a total experience value, utilizing the shared[Object](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class) [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class), which saves a score onto the computer, holding its value even after the program has been closed and reopened. This was hard to work with, as I've never used it before. At first, I tried saving the data into the main GameHandler [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class), but for some reason it wouldn't acknowledge the data. So I moved the data variable to the main file, and tried altering it directly from the scoring screen. This failed as well, as it kept returning a null value for the data value. I then tried initializing the data's value, which should define it as an integer. This ended up solving the problem, leaving the game working just fine!

Added [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)ality for all difficulties. This entailed allowing for incorrect-answer penalties. I have yet to bring in a timer for time bonuses. In the meantime, I've seen the time bonus at a default value of 0. Apart for some text box resizing, this worked perfectly without a hitch!

**February 12, 2013**

Added a timer to the game, so that the player knows how much time they have left. Included time bonuses into the score calculation as well.

**February 13, 2013**

As I worked on the timer feature, I realized that there were a few complications - first of all, I would need to remove the timer once the game ends. I also need to remove the timer when the player restarts the game, or exits to the menu. However, when they pause the game, the timer must also be removed or else the time will continue as the game is paused. Therefore, I need to allow the timer to pick up from where it left off, once the player unpauses the game.

**February 15, 2013**

As I started adding words to the database, I came upon a roadblock. I had built the program to handle lists of 10 words, on three difficulties. However, not all categories could handle this. Categories, such as family, do not have as many as 30 words to fill. Therefore, I need to add sub[class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es for the Category [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class) which allow access to these different attributes.

For a category as small as Family, I'll need a single list of words, especially since there is no need for difficulty. However, I will still need a difficulty to be set for all the properties it affects - just not the words, now.

After that comes the categories which have 30+ words, which will need to be separated into three difficulties, for lack of better differentiation.

This highlights the need for an additional dropdown list which allows the user to chose which words they wish to use, independant from the game difficulty. When a category with more than one wordlist is selected, an extra dropdown list will become visible and active, disappearing should a short category be chosen.

I will also change the round length to the length of the wordlist, so that users won't see only a fraction of the total words in a list.

I will try and keep each list of words, in a single category, of equal length so that the final scores are not affected due to extra length.

[**Method**](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method)**s** involving difficulty-based words:

* Category [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)
  + setWordsTo([array](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Array+Processor))
  + getRandomWords(quantity, difficulty)
  + getWordsP[erD](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=ERD)ifficulty(difficulty)
  + getDifficultyListByName(name)
* Game [Class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)
  + settingsTo(language, category, difficulty)
    - Because it calls getRandomWords
  + translateWord(inLanguage, outLanguage, word)
    - Because it accesses the allDifficulties [property](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Property) under Category

**Properties** involving difficulty-based words:

* Category [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)
  + easyList
  + medi[umL](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=UML)ist
  + hardList
  + allDifficulties

I will have to alter all of the [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method)s, and redesign the properties in the sub[class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es.

**Over half-term**

I wrote the new [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es: CategorySmall, CategoryMedium and CategoryLarge. The main differences in these [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es is the number of wod lists they can hold - 1, 2, and 3 respectively. Likewise, they override the setWordsTo [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method) from the Category super[class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class), in order to accomodate to these differing [form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29)ats.

With the new types of categories, I was able to write suitable lists of english words for all of the categories. Their lengths are as follows:

Small

* Pronouns
* Colors
* Countries

Medium

* Family
* Phrases
* Activities

Large

* commonVerbs
* commonNouns
* commonAdjectives
* numbers
* travel

All that needs to be done is for each category's words to be translated and saved into the foreign languages.

As I tried implementing these new category [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es, I came across an error I have yet to solve. Whenever I tried compiling, an error would state that an [array](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Array+Processor), allLists, has not been defined for each of the sub[class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es. The allLists [array](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Array+Processor) was declared in the Category super[class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class), but for some reason it has not been passed on to the sub[class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es. On top of this, the [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es fail to recognise their own properties. To solve this, I have done some research to find a solution, but have yet to find an answer.

**February 27, 2013**

I began a rough and quick translation process involving copying and pasting words into Google Translate. A few errors have arisen from this:

1. **Sometimes, a quotation mark will be translated to a << symbol.**
2. Unnecessary spaces have been added, which will make the output/expected input faulty.
3. Not all of the words which canbe translated, have been translated, due to lack of context
4. With the software being non-professional, some words may not have been translated correctly. For example, the program will not know the difference between Turkey and a turkey, or you and you (plural).
5. Unexpected capitalisation
6. **For Japanese, their alphabet and characters will be unreadable, so I'll need to get phonetic spellings. Google Translate offers this, but gives a list which omits the easy-to-read**[**form**](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29)**at.**
7. The double processing between English, to Japanese, to Roman Japanese lost a lot in translation.
8. Compound words, such as sight seeing, may not have translated correctly, as the program may have translated "sight" and "seeing" separately.
9. Repeated words, such as ellos (meaning both them and they in Spanish) will return the latter words as "the correct translation".
10. When translating, the translateTo [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method) searches all categories, which is inefficient.
11. Numbers will need to accept numerical input, but with spelled output.

Here are my solutions, to be done once all words have been translated:

1. Use replace and find to replace the symbols with the correct " symbols. This won't cause any problems, because the << and >> symbols are unique to this error, and so the replacement will not make any unexpected changes.
2. I will need to manually go through the words and remove unwanted spaces. This is tricky because a simple find and replace will not suffice, since one spaces are actually needed.
3. I will manually translate this words individually.
4. I don't know how to solve this one without taking up way too much time and, if necessary for a good translation, money. This could be solved by a manual translation override in the program, but this will not solve the issue of misin[form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29)ation.
5. I could either use a toLowerCase [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function), or I could manually change everything. I'll decide which would work best later.
6. I will manually re[form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29)at the romanji words (English alphabet, Japanese words)
7. See solutions 1, 2 and 3.
8. See solution 3.
9. Still figuring this one out.
10. I will rewrite the translateTo [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method) to accept a category parameter to narrow the search.
11. Handle numbers differently from the rest of the categories, using a different way to find the correct answer.

**February 28, 2013**

I revisited implementing the three new sub[class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es, to find a new error: Error #1006: value is not a [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function). I researched this error, to find advice for something I am not using. I began using the Debug softare in Flash to find exactly where the error took place. Curiously, this error occurred after the [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function) setWordsTo had executed three times successfully, to hit the error when dealing with the Numbers category.

This error was because I had written integer values for the numbers, rather than string numbers. I ended up hitting two birds with one stone, since I needed to change the integers to phonetic spellings anyway. Once this was converted to string values, the error was solved and the program successfully compiled.

Next, I needed to change the Game [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class) to allow for the separation of Game difficulty and word Difficulty, as well as the integration of the new subcategories. To do this, I made the following changes:

* Removed the defined number of words, to allow for differing lengths of word lists. Removed TotalRounds variable.
* Removed chosenLanguage from the Game [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class), as it is now superfluous, being used in the LanguageGameHandler.
* Added the sub-category setting in the game settings UI, which will change based on the [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class) of the chosen Category.
* Added a default void value to all combo boxes
* Set the subcategory setting to disabled by default, to be enabled once a category has been chosen.
* Changed the getWordsP[erD](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=ERD)ifficulty [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method) to getWordsPerSubcategory, along with related [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)ality.
* Replaced the input of the settings comboboxes from their text values, to their "Value" values, which are independant from the option labels. (ie the label seen by the user, "Set 1" will have a value of "firstList" for use in the code)

**March 1, 2013**

I began testing the game for the first time since giving the Flash Games full [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)ality. I came across some hilarious problems:

* Words would come on to the screen, regardless of selected options
* Words would translate incorrectly, for example claiming that cafe meant woman.
* The word "hardList" came up one time...
* Trying a [second](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29) time, Brasil translated to Brasil, and Indias to Indias.
* On later interations, words would translate to [Expected Answer]
* Would be the wrong [form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29)at
* Would not be randomised
* And more!

**March 4, 2013**

Began and documented a [form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29)al test of the fauly program, as to determine what the problem was, and how best to fix it.

**March 5, 2013**

I went through, fixing and documenting the main bug fixes. This can be found in better detail on an attached document to be added later.

Fixed, checked and implemented the following languages:

* Spanish
* German
* French
* Turkish

Added the English to Foreign [form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29)at, which presents an English word as output, and receives its foreign translation as input.

**March 5, 2013**

Fixed, checked and implemented the following languages:

* Japanese
* Italian

Updated UI.

Fixed a bug where the CategorySmall lists were all being reset with each consecutive addition. Turns out, I was assigning the pointer of the parameter to the wordList [array](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Array+Processor), rather than the parameter's values. I changed that by replacing the line of code with a three-line for l[oop](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method). This fixed it.

Created a more [form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29)al bug-fixing document, as well as a document explaining the design and [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function) of the program's [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es.

**March 8, 2013**

I ran into some trouble with the frame transitions, as the previous menu button was fault when moving from game selection to language selection. I haven't yet figured out why, but in investigating this I realized that my current code for menu interaction and navigation was poorly structured.

As is good practice, I need to have event listeners present only on the frames where the belong. To do this, I need to create a tight system of event listener removals to make sure that, if an event listener is no longer needed or present, then it will be removed. This should also fix a recently observed error where the program was listening for a certain [property](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Property) change in the comboBoxes, when they were no longer present on the stage.

So for the buttons and their event listeners, they can be split up into two categories:

1. Buttons which are entirely unique to the frame - ie language buttons or game buttons
2. Buttons which are on screen for a number of different frames
   1. The Previous Menu button should only be present on frames 2-6
      1. For frame 2, that previous menu is language selection
      2. For frames 3-6, that previous menu will be game selection
   2. The Translation Button which is present in frames 1-6 and frame 12
   3. The pause screen menu button should only be present on the game frames, 7-10
   4. The play button, available in frames 3-6, which brings up the selected game frame.

However, there are a number of event Listeners to be taken into account

1. The comboBox event listener, which constantly makes checks which category has been selected, and enables the corresponding sub-category comboBox.
2. The previous menu and pause menu buttons need to have their eventListeners added before the frame has loaded, as to not need to differentiate between which frame executes the code.

This was all solved by coordination of adding and removing event listeners.

**March 11, 2013**

Begun to add a translation screen, offering the user a selection of "from" and "to" languages, where they can input a word and receive it's translation. This required the translateWord [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method) to be altered, so that it may have a default values of null for the category and subcategory parameters, as they will not be specified.

**March 12, 2013**

Managed to get the translation screen working, and also added a textbox showing all of the English words stored on the database. This allows the user to see all of the word they may translate. To do this, I wrote a new algorithm for a [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method) which returns all of the words from the English language.

**March 13, 2013**

After running the game I realized that there was some confusion in the code about when to add and remove event listeners. After a while of unsuccessful attempts at fixing this, I decided to use a new [method](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Method) for buttons. An ideal system will listen for when a button is added or removed, and will dynamically add event listeners accordingly. This makes the whole system automatic rather than manual, hence ensuring a more reliable per[form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29)ance.

Updated button designs for New Game, Replay, Restart and Menu buttons.

To get started on the design for the event listeners, I did some research into the expected [form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29)at for flash files. From this, I have learned about the use of a Document [Class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class), which removes the need for code in the timeline of the .fla file, and holds it instead. Additionally, I need to change the properties of all of the game's buttons to allow them to be exported using ActionScript. In doing so, I also need to create separate [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)es for each so that the document [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class) may instantiate them.

Since this is an entirely new concept for me, I will start off small to test before moving all of my code and stage [object](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)s to the document [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class). Therefore, I will only be using the troublesome few buttons before testing them and, hopefully, implementing the rest.

* Previous Frame
* Pause
* Translate/word list
* Play Game

However, once I started implementing these buttons, I realized that, because of the [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)s called by their event listeners, I would also need to include those [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)s, and all related to them, into the document [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class). This means that, by extension, I may need to import all of my timeline code at once in order for any tests to be carried out. This has a high risk of failing, and if it does so beyond reparation, I will just use my backup file to resume where I left off before the change.

**March 15, 2013**

Started going through all of the code bit by bit, making sure everything was fine and that all comments have been added.

**March 20, 2013**

Added languages:

* Portuguese
* Finnish
* Dutch

Making the language database complete.

**March** **28, 2013**

Wrote up a testing plan for the black box testing

**April 7, 2013**

Completed half of the testing today

**April 15, 2013**

Did a bit more testing, and changed the way that screenshot evidence worked. Instead of copying the screenshot directly into the evidence column of the table, I just type a reference, such as "Evidence 16". Later on down the [page](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Page), the screenshot evidences are listed, each with a corresponding label.

**April 16, 2013**

Given the amount of time I have until the end of the project, I thought I'd try working on the Choices (multiple choice) game type. I felt that having at least two gametypes would be the most useful for the user. I began planning the changes needed to the Game [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class), as well as what will differ in the frame code of the game itself.

**April 17, 2013**

When copying the code from the Flash Cards game frame to the Choices game frame, I realized that doing so would result in duplicate [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function) declaractions. My initial idea to prevent this was to rename the duplicate [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)s. However, I realized that many were, in [fact](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Fact), complete duplicates with no necessary changes, despite the game type. Therefore, it would be more prudent to simple declare those similar [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)s only once, to be called when needed by either game.

However, the dissimilar [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)s remained. This was an issue, because the similar [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)s call on at least one dissimilar [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function) at least once. This means that, while the code is similar in the similar [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)s, the [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)s that they call are not. However, the problem could not be solved by simply renaming them as two different [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)s, as the problem la deeper. Not only did the similar [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)s call those dissimilar ones, but previously written global and otherwise independant [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)s also call on the dissimilar frame [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)s. Therefore, the best solution, to avoid repeating as much code as possible, was to enclose each call of a dissimilar [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function) within a conditional, which checks what gametype has been chosen, and calls the appropriate [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function" \o "A2 Computing terms glossary: Function)accordingly.

In the end, after deleting the duplicates, only three of these conditionals were added. Additionally, I copied the timer code in to the Game [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class), as I realized it was entirely independent from the UI, which is dictated by the in frame code.

**April 18, 2013**

Today, I wrote all of the new code to complete the [function](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Function)ality for the choices game. By the end of the day, everything was working just fine, but it took a few attempts to get the algorithms right for displaying the correct words in the radio buttons. I kept track of this process, and included evidence of the algorithm's development in great detail in another document.

**April 22, 2013**

Finished testing the scoring. Since the testing [form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29) was so large, I had to make it in Excel, and screen print it into the Word document. This ended up working very well, giving me a good spread of testing situations. With this, the black box testing has been completely finished.

**April 23, 2013**

Wrote the user guide and began working on the online help, along with screenshot illustrations to show what to expect from the game.

Fixed a bug, highlighted by testing, where the frame transition would cut out halfway, and occasionally break whhen going to the previous frame from the game selection screen.

Added the online help button in the game - a small button in the bottom right of the screen at all times.

**April 24, 2013**

Finished writing the online help, along with hyperlinks, etc. I made sure all of the linked [page](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Page)s were correct, and fully connected appropriately through hyperlinks. After running through this, I found that this works just fine.

I went through and correct the user guide, checking again to see that everything was accurate and useful for the user. For example, after adding online help, I had to modify the steps for installing the program.

Added contact in[form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29)ation and minimum hardware/software requirements to the user guide.

Extended the troubleshooting to include online-help and [translator](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Translator) issues.

I went through all of the standalone documents I made over the developement of the project, and added them to the main project document. This means that all of the algorithm development, testing and design should be present in the correct sections of the main document.

I fleshed out the project [form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29) to make sure that it all linked together well. This included a more solid framework to link together all of the standalone documents. Setting out this plan, I began work on systematically describing the development process (including all changes made to the previous sections, such as [object](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)ives, algorithm design and [class](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class) design) using this log as a reference to each of my steps.

Held a skype inteview with Natasha, complete with screenshots of her testing the finished game via Skype's Screen Share feature. This allowed a great amount of evidence to be gained about Natasha's thoughts testing results and how well she interacts with the program. With the real-time display of how she was enjoying the game, it was clear that she was very pleased with it.

After she tested the game and filled out the testing [form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29) I sent to her by email, we conducted one final interview to get all of her thoughts on the game and how it reflect upon what she wanted out of it from the beginning. I included the transcript with the full project document.

Most of the work is now fully out of the way, and very little remains. I added a some more evidence and explanations to the Design, Development, Testing, Documentation and Evaluation sections.

**April 25, 2013**

I went right back to work on the project work, fleshing out the evaluation in reflection of the interview I had with the end user, during which we both went through the original [object](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)ives, as well as the revised [object](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Class)ives and whether or not they were met.

I then worked more on marking up the scoring design and development. After getting some guidance on this, I realized that the design that had taken place during the official "Development" stage, should actually be mentioned as such in the Design section, despite not taking place in that section. Essentially, the spiral shape of the development needs to be linearized for the document, and I need to reflect this. Doing so will take a while of editing of the final project [form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29).

After some re[form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29)atting and extensive use of Word's [form](http://moodle.solihullsfc.ac.uk/mod/glossary/showentry.php?courseid=389&concept=Second+normal+form+%282NF%29)atting system, I was able to finished polishing off the main Project Document, and copy this log into it. It's been fun! Glad to have it all neat and packaged up by the deadline, even if I am cutting it a little close.