

VBA Final Project – FlashCard Tool

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Executive Summary

A classmate of mine introduced me to a website called www.flashcardmachine.com. It's a great tool to help students memorize definitions and terms. A specific example of a flashcard set that was created for our real estate class is found [here](#). I wanted to recreate the basic functionality of the website, but improve upon it in Excel by incorporating hint functionality. The basic functions that I incorporated from the website are:

- Ability to star (or flag) difficult items for further study (See Figure 2).
- Randomization of terms
- Ability to save or discard changes to stars made in current study session (See Figure 7).
- Ability to study in star mode (in which only starred items show) or not (in which all items show) (See Figure 1).

In addition to the above, I added the following functionality:

- Added two separate hint functions:
 - Show 4 possible answers to the question in a message box (See Figure 3)
 - Show first letter of word in the definition (See Figure 4)
- Added "Remove all Stars" button which enables user to unstar all starred terms, essentially allowing the user to start with a clean slate (See Figure 8).

Implementation and Documentation

- I began solving the problem by creating an appealing user interface and by figuring out how to get the star to alternate from yellow to white.
- When the star button is clicked, it changes the corresponding star value in the terms database. See Figure 9 for a screenshot of this database.
- My next challenge was trying to come up with a good counting mechanism to progress through the flashcard set, but not overrun it once the end was reached.
 - I had two counting variables, countNum and numberOfTerms. countNum is the more important of the two. It iterates by one each time the next/previous buttons are clicked.
 - If countNum is odd, only the term is shown. If countNum is even, both the term and the definition are shown.
 - countNum and integer division were used to ensure that changes made to the starred status of a term would be consistent between the term and the definition. If the star status is changed for the term, it will be this same changed state for the definition.
 - I used a combination of countNum and numberOfTerms to prompt the user when he reaches the beginning or end of the file, providing a prompt when this occurs (See Figure 6).
- When selecting the Begin button, the user has the option of showing all terms or simply showing starred terms. The response to this question changes the way that the next/previous buttons work. In "Star Mode", the program finds the next starred item (See Figure 1).
- The Remove All Stars button removes all stars from the terms (See Figure 7).
- The Hint-Multiple Choice button gives 4 possible answers to the definition. See Figure 3 for an illustration of the functionality. I had to be pretty creative here. In order to not have the correct answer show up in the same space each time, I had to create a random variable with a value of 1 to 4 which randomly assigned the

placement of the variable. Wrong answers were assigned in a similar manner. I used a series of if statements to appropriately place these in a message box. There were many lines of code dedicated towards the implementation of this logic.

- The Hint - 1st Letter button simply shows the first letter of each term in the definition. See Figure 3 for an illustration of the functionality. I obviously used a bunch of string commands to get this to work properly. One thing that I liked was that I allowed punctuation, such as commas, periods, and parentheses, to pass through. Lots of good logic was required to properly implement this.
- The End Session button allows the user to end the current study session (but not close the workbook) and save any changes made to the stars. If the user does not wish to save changes, the previous status of stars will be restored. This is accomplished by actually copy the Database sheet into a new sheet called DatabaseOriginal. Upon saving changes, the DatabaseOriginal contents become obsolete, so they are removed. Upon discarding changes, the Database sheet is replaced by the contents of the DatabaseOriginal sheet, effectively undoing all changes to the stars made by the user. See Figure 6 for prompt.
- Lastly, each time the Begin button is hit, the list of definitions is re-randomized (not the pointer to the list, but the list itself). This approach doesn't seem particularly elegant, but it was the most practical way of implementing this functionality without having to recreate my program from scratch after it had been coded to sequentially go through the terms. I think my solution is pretty elegant and quick.

Discussion of Learning

I learned that this project was a lot harder to implement than I thought it would be. I learned to be patient, and systematically go through the project in an incremental fashion. I learned the importance of mapping out the logic on paper (pseudocode) prior to attacking the problem. I learned debugging using msbox is pretty handy. It was fun being able to implement the skills I'd learned all semester into this real world project.

Summary

I thought that this project would be a lot easier than it turned out to be. The code involved in properly implementing the logic is pretty substantial. The added functionality from the hints turned out to be challenging. I accomplished the functionality that I intended to mimic, so I'd consider the project a success.

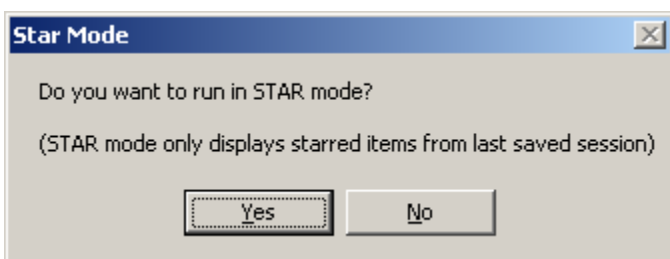


Figure 1. User prompt to determine whether program should run in STAR mode or not

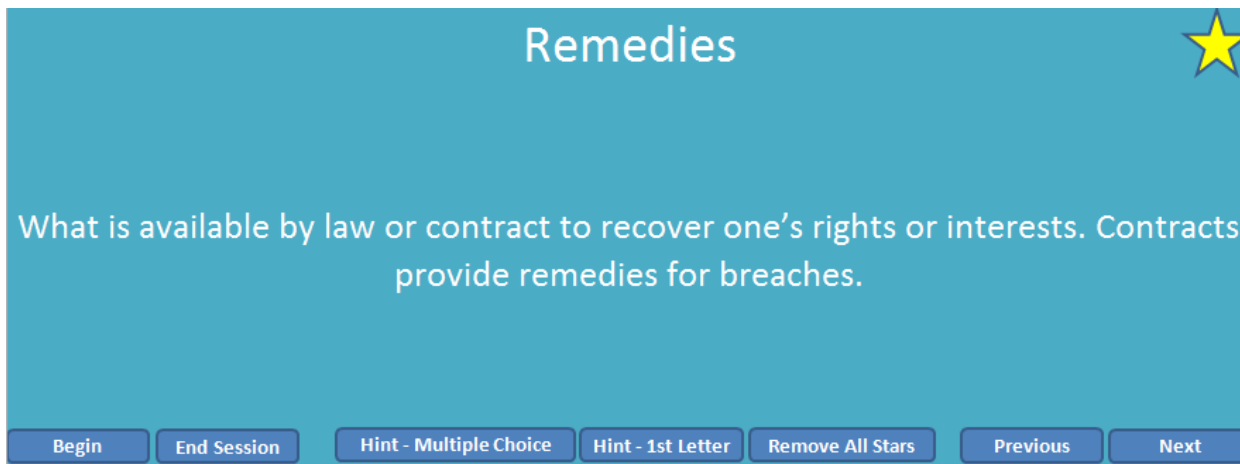


Figure 2. Basic interface of flash card program.

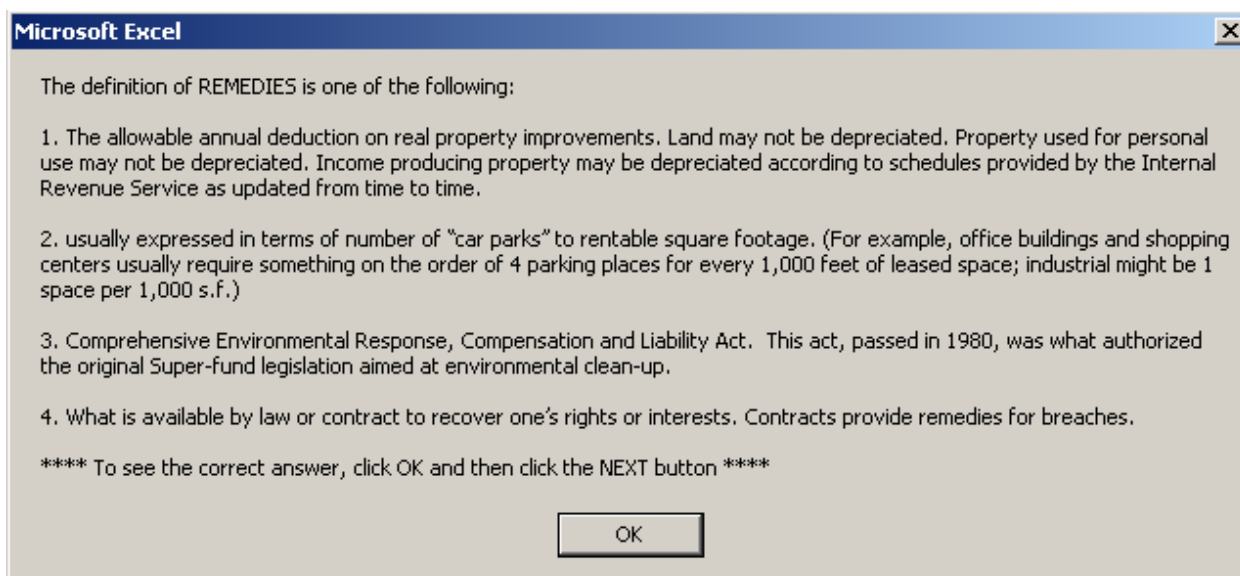


Figure 3. Demonstration of multiple choice hint functionality for the term "Remedies."

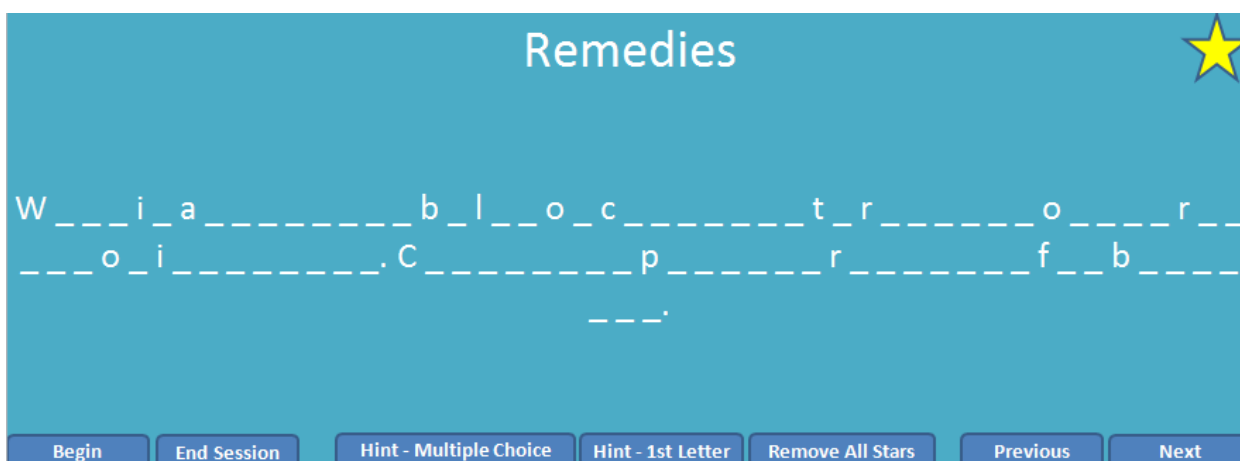


Figure 4. Demonstration of 1st letter hint functionality for the term "Remedies."

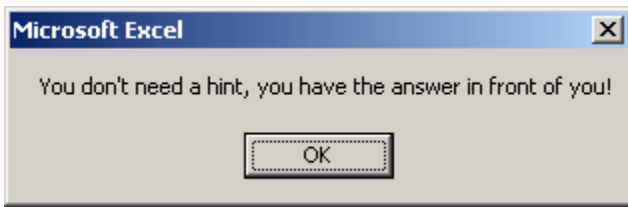


Figure 5. Prompt following pressing of hint buttons when answer is already shown.

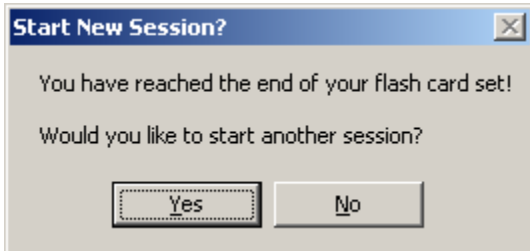


Figure 6. Prompt indicating the reaching of the end of the flash card set, allowing the user to start a new session if desired.

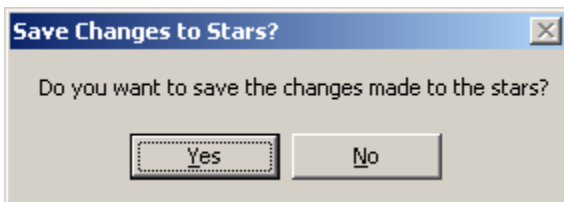


Figure 7. Prompt to save changes made to stars during the current session.

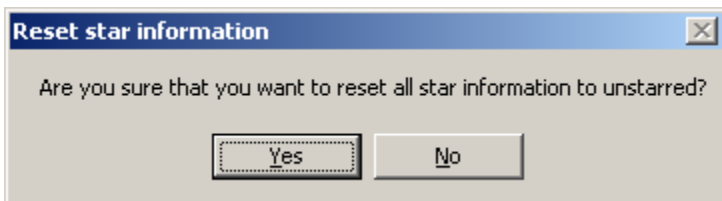


Figure 8. Prompt ensuring that user really wants to reset all star information to unstarred.

	A	B	C
1	Term	Definition	Star
2	Remedies	What is available by law or co	TRUE
3	Floor-Area-Ratio	The relationship of the total f	TRUE
4	Joint Venture (J	a special purpose association	TRUE
5	Tax-free exchan	Should be called tax-deferred	TRUE
6	Plat	a survey that shows location c	TRUE
7	Cash-on-cash Re	The first year pre-tax yield on	TRUE
8	Lessee	The tenant. (A tenant may hav	TRUE
9	Statute of Fraud	The legal doctrine that requir	TRUE
10	Chain of Title	The recorded history of conve	TRUE
11	Purchase money	Seller financing for all or part	TRUE
12	Chattel	Physical property that is move	TRUE
13	RTC (Resolution	Established by the governmer	TRUE
14	Leverage	Financial leverage has to do w	TRUE

Figure 9. Screenshot of “Database” tab which contains the editable list of terms.