

Final Homework Question 2 (Expected time: 2 Days comfortably)

1. (16 marks -> will be scaled down to 10) You are to write a Prolog program for a note application, which helps you note short words.

Design all the code and data by yourself.

Hint:

- use “asserta(X)” to write X to memory and “retract(X)” to remove X from memory.
- Declare **:-dynamic X/Y.** in the beginning of your file to allow predicate X (which has Y parameters) to be used with “asserta” and “retract”.
- **:-reconsult('anotherfile.pl').** can be used on the first line to import another file.
- **Example execution covers the entire program execution (continue from table to table), but it is divided into parts corresponding to each function.**

The program has the following functions:

- **new (3 marks).** This function is used to record a new word.
 - The words are sorted (top to bottom), the latest input is on top.
 - Number is used to identify each word (it is called “line number”).
 - Same words can be input several times.
 - **All words are shown after the recording.**

Example execution (the left column comes first):

<pre>?- new. Please type new text : aaaaa. ----- 1: aaaaa true. ?- new. Please type new text : bbbbbb. ----- 1: bbbbbb 2: aaaaa true. ?- new. Please type new text : ccccc. ----- 1: ccccc 2: bbbbbb 3: aaaaa true.</pre>	<pre>?- new. Please type new text : ddddd. ----- 1: ddddd 2: ccccc 3: bbbbbb 4: aaaaa true. ?- new. Please type new text : fffffff. ----- 1: fffffff 2: ddddd 3: ccccc 4: bbbbbb 5: aaaaa true.</pre>
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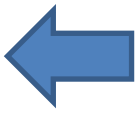
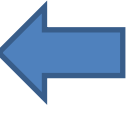
Latest word is always on line number 1. So we need to re-arrange all the numbers.

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- pin(4 marks)

- This function takes a specified line number in the note (a normal part of the note will be called normal section from now on) and move it to “pinned” section, which is on top of all the words.
- Pinned section is like the normal section, the latest words are on top.
- Pinned section has its own line numbers.
- The line number must be legal, or the user is prompted to re-enter the line number.
- When a word is moved to a pinned section. The numbers of all other words in the normal section must be updated so that no gaps appear in the line numbers!
- Don't forget to show the words after the function is executed.

Example execution (the left column comes first):




<pre>?- pin. which line of normal text do you want to pin? : 2. 1: dddddd ----- 1: fffffff 2: ccccc 3: bbbbbb 4: aaaaa true .</pre>  <div>Numbers are re-organized from the previous page.</div>	<pre>?- pin. which line of normal text do you want to pin? : 3. 1: aaaaa 2: fffffff 3: dddddd ----- 1: ccccc 2: bbbbbb true .</pre>
<pre>?- pin. which line of normal text do you want to pin? : 1. 1: fffffff 2: dddddd ----- 1: ccccc 2: bbbbbb 3: aaaaa true .</pre>  <div>Latest word is always on line number 1.</div>	<pre>?- pin. which line of normal text do you want to pin? : 0. illegal input, please try again. which line of normal text do you want to pin? : 3. illegal input, please try again. which line of normal text do you want to pin? : 1. 1: ccccc 2: aaaaa 3: fffffff 4: dddddd ----- 1: bbbbbb true .</pre>

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- unpin (3 marks)

- This function moves a specified line (indicated by a line number) from the pinned section down to the normal section.
- The line number must be legal, or the user is prompted to re-enter the line number.
- Numbers in the pinned section then need to be re-arranged to avoid gaps.
- The moved word is put on the top of the normal section (line numbers need rearrangement).
- Don't forget to show the words after the function is executed.

Example execution (the left column comes first):

<pre>?- unpin. which line of PIN text do you want to unpin? : 0. illegal input, please try again. which line of PIN text do you want to unpin? : 5. illegal input, please try again. which line of PIN text do you want to unpin? : 1. 1: aaaaa 2: fffffff 3: ddddd ----- 1: ccccc 2: bbbbbb true .</pre>  <div data-bbox="309 801 708 882">Illegal values cannot be used.</div>	<pre>?- unpin. which line of PIN text do you want to unpin? : 2. 1: aaaaa 2: ddddd ----- 1: fffffff 2: ccccc 3: bbbbbb true . ?- unpin. which line of PIN text do you want to unpin? : 2. 1: aaaaa ----- 1: ddddd 2: fffffff 3: ccccc 4: bbbbbb true .</pre>  <div data-bbox="1021 725 1394 801">Numbers are re-organized.</div>  <div data-bbox="1021 860 1394 936">Numbers are re-organized.</div>
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- **delLine (3 marks)**

- Remove a specified line from a normal section.
- The line number must be legal, or the user is prompted to re-enter the line number.
- Line numbers must be rearranged after the remove.

Example execution (the left column comes first):

<pre>?- delLine. which line of normal text do you want to delete? : 3. 1: aaaaa ----- 1: dddddd 2: fffffff 3: bbbbbb true . ?- delLine. which line of normal text do you want to delete? : 1. 1: aaaaa ----- 1: fffffff 2: bbbbbb true .</pre>	<pre>?- delLine. which line of normal text do you want to delete? : 0. illegal input, please try again. which line of normal text do you want to delete? : 3. illegal input, please try again. which line of normal text do you want to delete? : 2. 1: aaaaa ----- 1: fffffff true .</pre>
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- **save (1 mark)**
 - save all information to file.
- **show (2 marks)**
 - print all pinned and normal lines.

Example execution (left column comes first) (Some new lines are added first (and pinned) before saving.

<pre>?- new. Please type new text : wwwwwwwwwwww. 1: aaaaa ----- 1: wwwwwwwwwwww 2: ffffff true. ?- new. Please type new text : xxxxxxxxxxxxxx. 1: aaaaa ----- 1: xxxxxxxxxxxxxx 2: wwwwwwwwwwww 3: ffffff true.</pre>	<pre>?- pin. which line of normal text do you want to pin? : 1. 1: xxxxxxxxxxxxxx 2: aaaaa ----- 1: wwwwwwwwwwww 2: ffffff true . ?- save. true. %after closing and opening the program again: ?- show. 1: xxxxxxxxxxxxxx 2: aaaaa ----- 1: wwwwwwwwwwww 2: ffffff true.</pre>
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How to submit:

Zip your prolog files into a zip file named with your id (for example, 6133320021_HW_Final_Q2.zip) and submit it on MyCourseville.