## CS190I HW Assignment 3 Assigned: Thu, Feb 2<sup>nd</sup>, 2006 Due: Thu, Feb 9<sup>th</sup>, 2006

The following describes two versions of a graphical user interface prototyped for a real-life scenario in a telecommunications company. These interfaces were developed and used by Jakob Nielsen in experiments conducted at BellCore. The interfaces are described below. The first interface is called the Dialog Box interface and the second is the Pop-Up Menu interface. The Dialog Box interface was an easy-to-implement prototype. The Pop-Up Menu interface was a potential alternative design that was arrived at in a debriefing session following a heuristic evaluation of Design A, but it was expected to be much harder to implement. The managers now wanted to know what the expected performance times for an expert user would be for either design.

Do a KLM analysis on BOTH interface alternatives and predict the expert performance time for two tasks each (single telephone number query, double telephone number query). In order to do this, you have to come up with an initial list of (non-'M') keystroke-level operators, then insert 'M' operators according to Rule 0, and then remove selected 'M's by applying rules 1-5.

User Action	System Response	M originally inserted	M deleted? (Rule #)	KLM Operator	Time
Action1	Response1	"yes" or "no"	"no" or one of 1-5	one of K,P,H,R	time for this action (incl. M, if present)
Action2	Response2	"	"	"	"
Action3	Response3	"	"	"	"
ActionN	ResponseN	"	"	"	"

The final result should be a chart with the following 6 columns for each of the 4 cases:

The spreadsheet that I pointed you to in class (H19) shows you a heavily annotated example of a simple KLM analysis. You do not have to provide as explicit commentary as in that case, but in order to get partial credit for answers that are a matter of interpretation you need to make some argument about why you applied what rule. If you don't do this, we will simply compare your solution with our standard solution and only give points for the parts where the two solutions have the same operators listed.

Basically, follow the format we used for Raskin's (H17) KLM example (covered in class). As in class, use Raskin's notation, times, and heuristics. Once you're done with the four analyses, add up your total times for each case to get your predictions.

An important last step of the assignment is to summarize your results in one or two paragraphs!

Again, you need to build four (4) KLMs: Two for each of the two interfaces illustrated below (Dialog Box and Pop-Up Menu), a single-query KLM and a double-query KLM.

NOTE: Assume system response time is zero for menus popping up or unfolding. You will not need to make any assumptions about the system response time for the actual database queries.

[Thanks to Bonnie John for providing access to these materials.]

## The first interface is called the *Dialog Box* interface.

"The users' task in this study is that of issuing a query to one out of several databases on one or more data items such as telephone numbers, customer names, addresses, etc. For the purpose of the current study, we looked at queries on telephone numbers. Furthermore, we only studied queries on one or two telephone numbers even though the actual application sometimes involves queries for more than two telephone numbers. The users will be working in a window system, and the information that is to be looked up in the databases can be assumed to be visible on the screen..." [Figure 1]

Fi	le	Edi t	Databaseş
			7
[	123	3-456	7
	234	4-5678	8
	34	5-6789	9
	34	5-7899	9
	76	5-432	1

Figure 1 - The screen as it looks before the menu choices. The telephone numbers to be looked up are in the window at the bottom of the screen.

"To use this interface, the user first pulls down a menu from the menu bar at the top of the screen. This menu contains the names of the databases and the user positions the mouse cursor over the name of the relevant database in this list. [Figure 2]

File Edit	Datab DB1 DB2 DB3 DB4	bases		
123-456	7			
234-567	8			
345-678	9			
345-789	9			
765-432	1			

Figure 2

A hierarchical submenu appears with legal queries for the chosen database. This submenu contains an average of four alternatives, and the user moves the mouse until it highlights the option "query on telephone number." The user then releases the mouse button. [Figure 3]

Fil	e Edit	Databases DB1 DB2 DB3 DB4	<ul> <li>query on name</li> <li>query on address query on telephone query on business</li> </ul>	K
Γ	123-456	7		
	234-567	8		
	345-678	9		
	345-789	9		
	765-432	1		

Figure 3

"This causes a standard sized dialog box to appear in the middle of the screen as shown in Figure 4. The large field at the top is initially empty. This field will eventually list the telephone numbers to be submitted to the database as a query. The dialog box does not overlap the window with the list of telephone numbers.

File Edit Databases	
Inquiry Box	Add Delete Update
OK Cancel	Help
123-4567 234-5678 345-6789 345-7899 765-4321	

"The user clicks in the input field (the one-line field below the prompt "Inquiry on telephone number") and types the telephone number. (Figure 5)

File Edit Databases	
Inquiry Box	Add
	Delete
	Update
Inquiry on telephone number	
123-4567 <u>L</u>	
OK Cancel	Help
123-4567	
234-5678	
345-6789	
345-7899	
765-4321	

Figure 5

"The user clicks on the "Add" button to add the number to the query. (Figure 6)

File Edit Databases	
Inquiry Box	Add Delete
Inquiry on telephone number 123-4567	
OK Cancel	Help
123-4567 234-5678 345-6789 345-7899	
765-4321	

File Edit Databases	
Inquiry Box 123-4567	Add Delete Update
123-4567       OK       Cancel	Help
123-4567 234-5678 345-6789 345-7899 765-4321	

"[Figure 7] shows the state of the dialog box after the user's click on "Add."

Figure 7

"If the query is for a single telephone number, the user then clicks on the "OK" button to submit the query. (Figure 8)

File Edit Databases	
Inquiry Box 123-4567	Add Delete
Inquiry on telephone number 123-4567	
OK Cancel	Help
123-4567	
234-5678	
345-6789	
345-7899	
765-4321	

Figure 8

"If the query is for two telephone numbers, the user instead clicks in the input field and selects the previously typed telephone number by dragging the mouse cursor over the existing text in the input field. (Figure 9)

File Edit Databases	
Inquiry Box	Add
123-4567	Delete
	Update
Inquiry on telephone number	
123-4567 <u>I</u>	
OK Cancel	Help
123-4567	7
234-5678	
345-6789	
345-7899	
765-4321	
	-

Figure 9

"The user then types in the second number (thus replacing the previous selection in the input field) (Figure 10) and clicks on the "Add" button. (Figure 11)

File Edit Databases	
Inquiry Box 123-4567	Add Delete
Inquiry on telephone number 765-4321 I	
OK Cancel	Help
123-4567 234-5678 345-6789 345-7899 765-4321	

File Edit Databases	
Inquiry Box 123-4567	Add Delete
Inquiry on telephone number 765-4321	
OK Cancel	Help
123-4567	
234-5678 345-6789	
345-7899	
765-4321	

Figure 11

"Finally, the user clicks on the "OK" button to submit both queries at once." (Figure 12)

File Edit Databases	
Inquiry Box 123-4567 765-4321 Inquiry on telephone number 123-4567	Add Delete Update
OK Cancel	Help
123-4567 234-5678 345-6789 345-7899 765-4321	

Figure 12

End of the walkthrough of the first interface, the Dialog Box interface.

## The second interface is the *Pop-Up Menu* interface.

"As previously mentioned, it can be assumed that the telephone number(s) in question is/are already visible on the screen. (Figure 13)



Figure 13

"To query for one number, the user moves the mouse cursor to the telephone number on the screen and presses down the mouse button. This causes a pop-up menu to appear over the number with one element for each database for which queries can be performed with telephone numbers as keys. (Figure 14)

File Edit Da	tabases
123-4567	DB1
234-5678	DB2
345-6789	DB3
345-7899	DB4
765-4321	



"The user moves the mouse until the desired database is highlighted in the pop-up menu. (Figure 15)

File	Edit	Dat	abases			
12	23-456	67				
23	34-567	'8	DB2			
34	45-678	9	DB3			
34	45-789	9	DB4			
76	65-432	21				

Figure 15

The user then lets go of the mouse button. (the system knows which number to search on because the user pointed to it when calling up the menu.) (Figure 16)



Figure 16 - the state of the screen after the first query has been sent, but the results of the query have not yet returned.

"To query for two numbers, the user repeats this entire interaction sequence for the second number. (Figures 17, 18 & 19) The second number was normally about five lines below the first number in the window. [NOTE: In our pictures, it is four lines below the first number.] It is possible to submit the second query before seeing the result of the first one, and the result of the first query can be assumed to appear such that it does not overlap the telephone number needed for the second query.



Figure 17



Figure 18

Fil	e Edit	Database	es		
	123-456	57			
	234-567	'8			
	345-678	9			
	345-789	9			
	765-432	21			
			k		

Figure 19 - the state of the screen after the double query has been sent but the results of the query have not yet returned.

End of the walkthrough for the second interface, the Pop-Up Menu interface.