



**National University of Computer and Emerging Sciences, Lahore
Campus**

	Course Name:	Human Computer Interaction	Course Code:	CS 422
	Program:	CS	Semester:	Spring 2020
	Duration:	24 Hours	Total Marks:	20
	Paper Date:	17 June 2020	Weight	5
	Section:	ALL	Page(s):	1
	Exam Type:	Take Home Quiz		

Name: AHMED WAHEED

Roll No: L17-4367

Section: A

Question: Apply KLM model (GOMS based model), apply the operators, quantify the performance in terms of time, and also apply heuristics if required of two scenarios on your own of any application of your choice. **(10 x 2 Points)**

ASSUMPTIONS:

- User have complete knowledge of interface
- No error made by user

Before heading onto the scenarios, here is the list of KLM operators with their execution time (s) so we can then apply them onto the following problems.

Operator		Time (s)
K	Press key	
	good typist (90 wpm)	0.12
	poor typist (40 wpm)	0.28
	non-typist	1.20
B	Mouse button press	
	down or up click	0.10 0.20
P	Point with mouse	
	Fitts' law average movement	$0.1 \log_2(D/S + 0.5)$ 1.10
H	Home hands to and from keyboard	0.40
D	Drawing – domain dependent	-
M	Mentally prepare	1.35
R	Response from system – measure	-

SCENARIOS

SCENARIO NO. 1:

I have taken the scenario of inserting a signature line in an MS Word document.

Operators used:

The operators, which we will use in this scenario, will include H (home hands to and from keyboard), K (press key), P (point with mouse), B (mouse button press), M (mentally prepare).

Operators Sequence:

- Move hand to mouse.
- Point with mouse to “**Insert**” button.
- Click the “**Insert**” button.
- Mentally prepare
- Point with mouse to “**Signature Line**” button.
- Click the “**Signature Line**” button.
- Move hand to keyboard.
- Type the name of the signer.
- Reach for the mouse again.
- Point the mouse to the signer’s title field.
- Click the signer’s title field.
- Move hand to keyboard
- Type the signer’s title.
- Reach for the mouse again.
- Point the mouse to the signer’s email address field.
- Click the signer’s email address field.
- Move hand to keyboard
- Type the signer’s email address.
- Reach for mouse again.
- Point the mouse to the “**OK**” button.
- Click the “**OK**” button.

Steps	Operator	Time(s)
Move hand to mouse.	H [mouse]	0.40
Point with mouse to “ Insert ” button.	P	1.10
Click the “ Insert ” button.	B [left click]	0.20
Mentally prepare	M	1.35
Point with mouse to “ Signature Line ” button.	P	1.10
Click the “ Signature Line ” button.	B [left click]	0.20
Move hand to keyboard.	H [keyboard]	0.40
Type the name of the signer.	5K [name] input: Ahmed	1.40 (poor typist)
Reach for the mouse again.	H [mouse]	0.40
Point the mouse to the signer’s title field.	P	1.10

Click the signer's title field	B [left click]	0.20
Move hand to keyboard	H [keyboard]	0.40
Type the signer's title.	7K [title] Input: Manager	1.96 (poor typist)
Reach for the mouse again.	H [mouse]	0.40
Point the mouse to the signer's email address field.	P	1.10
Click the signer's email address field.	B [left click]	0.20
Move hand to keyboard	H [keyboard]	0.40
Type the signer's email address.	13K [email address] Input: Ab1@gmail.com	3.64 (poor typist)
Reach for mouse again.	H [mouse]	0.40
Point the mouse to the "OK" button.	P	1.10
Click the "OK" button.	B [left click]	0.20

Before applying heuristics:

**H P B M P B H K K K K H P B H K K K K K K H P B H K K K K K K
K K K K K K H P B**

Applying heuristics:

Rule 0: Applying M before P and K but not placing M before a P that is used to place argument.

**H M P B M P B H M K M K M K M K H P B H M K M K M K M K M
K M K M K H P B H M K M K M K M K M K M K M K M K M K M K M
K M K M K H M P B**

Rule 1: Deletion of anticipated Ms

**H M P B M P B H K M K M K M K H P B H K M K M K M K M K M
K M K H P B H K M K M K M K M K M K M K M K M K M K M K M K
M K H M P B**

Rule 2: Deletion of Ms with cognitive units.

**H M P B M P B H M K K K K H P B H M K K K K K K H P B H M K K
K K K K K K K K K H M P B**

Rule 3,4,5 does not apply on my scenario

$$T_{\text{execute}} = T_K + T_H + T_B + T_P + T_M + T_D + T_R$$

$$T_{\text{execute}} = 25T_K + 7T_H + 4T_B + 5T_P + 6T_M + 0 + 0$$

$$T_{\text{execute}} = 24.20 \text{ s}$$

So after applying KLM model on the above scenario, we got total time of **22.85 s**

SCENARIO NO. 2:

I have taken the scenario of our submitted project **Employee management system** interface. The admin will login to the system. And will land to his dashboard. I have assumed that admin is on the main page of the employee management system and has complete knowledge of the system and will not make any errors.

Operators used:

The operators, which we will use in this scenario, will include H (home hands to and from keyboard), K (press key), P (point with mouse), B (mouse button press), M (mentally prepare).

Operators Sequence:

- Move hands to mouse.
- Point the mouse to the “**Admin**” button.
- Click the “**Admin**” button.
- Point the mouse to the “**Username**” field.
- Click the “**Username**” field.
- Move hand to keyboard.
- Type the username of the admin.
- Reach the mouse again.
- Point the mouse to the “**Password**” field.
- Click the “**Password**” field.
- Move hand to keyboard.
- Type the password of the admin.
- Move hand to the mouse.
- Point the “**Submit**” button.
- Click the “**Submit**” button

Steps	Operator	Time(s)
Move hand to mouse.	H [mouse]	0.40
Point the mouse to the “ Admin ” button.	P	1.10
Click the “ Admin ” button.	B [left click]	0.20
Point the mouse to the “ Username ” field.	P	1.10
Click the “ Username ” field.	B [left click]	0.20
Move hand to keyboard.	H [keyboard]	0.40
Type the username of the admin.	4K [username] Input: 2020	0.48 (good typist)
Reach the mouse again.	H [mouse]	0.40
Point the mouse to the “ Password ” field.	P	1.10

Click the “ Password ” field.	B [left click]	0.20
Move hand to keyboard.	H [keyboard]	0.40
Type the password of the admin.	6K [username] Input: aaaaaa	0.72 (good typist)
Move hand to the mouse.	H [mouse]	0.40
Point the “ Submit ” button.	P	1.10
Click the “ Submit ” button	B [left click]	0.20

Before applying heuristics:

H P B P B H K K K K H P B H K K K K K H P B

Applying heuristics:

Rule 0: Applying M before P and K but not placing M before a P that is used to place argument.

**H M P B P B H M K M K M K M K H P B H M K M K M K M K M K M K
H M P B**

Rule 1: Deletion of anticipated Ms.

**H M P B P B H K M K M K M K H P B H K M K M K M K M K M K H M P
B**

Rule 2: Deletion of Ms with cognitive units.

H M P B P B H M K K K K H P B H M K K K K K K H M P B

Rule 3,4,5 does not apply on my scenario

$$T_{\text{execute}} = T_K + T_H + T_B + T_P + T_M + T_D + T_R$$

$$T_{\text{execute}} = 10T_K + 5T_H + 4T_B + 4T_P + 4T_M + 0 + 0$$

$$T_{\text{execute}} = \mathbf{13.8 \text{ s}}$$

So after applying KLM model on the above scenario, we got total time of **13.8 s**