Operator	Description	Time (Tx)
K	Keystroke (or key press/release)	0.28 s
P	Pointing (mouse move)	1.10 s
H	Homing (hand switch K↔M)	0.40 s
B	Mouse Button Press or Release (Click is B+B)	0.10 s
M	Mental Preparation (thinking, planning)	1.35 s

Procedure :

- **Task:** Rename a file already visible on the desktop/in a folder.

- **Start Condition:** Cursor is in the document area, hands are on the mouse.

- **End Condition:** The file name is updated and the new name is finalized.

- **Assumption:** The new filename is short, e.g., "Report" (6 keystrokes).

Step	GOMS/KLM Operator	Calculation Time (s)	Notes
Goal: Rename File			
Method 1: Mouse-Centric (Click-Wait-Click/Type)			
1. Think/Plan (Start)	M	1.35	Decide which file to rename.
2. Point to the file	P	1.1	Move mouse cursor to file icon.
3. Select the file (click)	B	0.1	Mouse click to select.

4. Wait/Think (Initiate rename)	M	1.35	Wait for system to recognize click, prepare for second click.
5. Select name field (2nd click)	B	0.1	Second mouse click to enter rename mode.
6. Move hand to keyboard	H	0.4	Switch from mouse to keyboard.
7. Think/Prepare (New name)	M	1.35	Recall/plan the new file name.
8. Type "R-e-p-o-r-t"	6K	6×0.28=1.68	6 keystrokes for "Report"
9. Hit Enter to finalize	K	0.28	Keystroke to confirm the new name.
Total Predicted Time (Tp)	3M + 1P + 2B + 1H + 7K	7.71 s	(Sum of times)

$Tp=(3×TM)+(1×TP)+(2×TB)+(1×TH)+(7×TK)$

$Tp=(3×1.35)+(1×1.10)+(2×0.10)+(1×0.40)+(7×0.28)$

$Tp=4.05+1.10+0.20+0.40+1.96$

$Tp=7.71$ seconds

Trial	Predicted Time (Tp)	Actual Time (Ta)	Difference (Tp−Ta)	% Error
1	7.71 s	6.95 s	0.76	10.9352518%

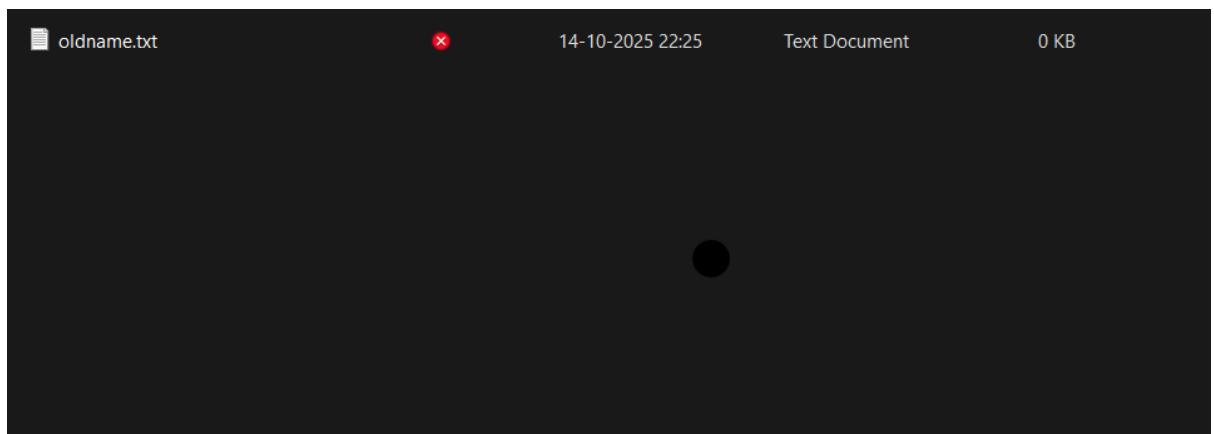|				-
2	7.71 s	7.80 s	-0.09	1.153846154%
3	7.71 s	7.55 s	0.16	2.119205298%
4	7.71 s	7.25 s	0.46	6.344827586%
5	7.71 s	8.00 s	-0.29	-3.625%
Average	7.71 s	7.51 s	+0.20 s	2.66%

Suggested Optimization :

The main bottlenecks are the three **Mental Operators (M)** and the use of the **mouse/keyboard switching (H)**. A common optimization for renaming files is using a keyboard shortcut (e.g., F2 on Windows or Enter/Return after selection on macOS).

Step	GOMS/KLM Operator	Calculation Time (s)	Notes
Goal: Rename File			
Method 2: Keyboard Shortcut (F2)			
1. Think/Plan (Select file)	M	1.35	
2. Point to the file	P	1.1	
3. Select the file (click)	B	0.1	
4. Move hand to keyboard (if necessary)	H	0.4	
5. Press F2 (or shortcut)	K	0.28	Enters rename

			mode directly.
6. Think/Prepare (New name)	M	1.35	
7. Type "R-e-p-o-r-t"	6K	1.68	
8. Hit Enter to finalize	K	0.28	
Total Predicted Time (Tp_new)	2M + 1P + 1B + 1H + 7K	6.54 s	

⬚ **Time Saved:** Tp (Original)−Tp_new (Optimized)=7.71 s−6.54 s=1.17 seconds

⬚ **Suggestion:** Promote the use of the keyboard shortcut (F2/Enter) to eliminate the extra mouse click/wait step, resulting in a task performance gain of .

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