

KLM - CO2 Emission Calculator

Human-Computer Interaction | Week 6 | Elias Group 4 | Ryan, Seeun & Tara

Symbolic Calculation Table

Symbol	Description	Time
K	Keystroke	Average non-secretarial typist (40 words per minute): 0.28s
H	Homing between mouse & keyboard	0.4s
B/BB	Pressing/Clicking mouse button	0.1s/0.2s
P	Pointing at target using mouse	1.1s (average according to lecture slides)
M	Mental act (thinking)	1.35s (according to lecture slides)
R	Response time of system	0.3s *

* This value was selected based on average server response times from LittleData where 0.324s is considered a good response time as it would be in the top 20%, which seems fitting in our scenario as it is a simple calculation [1].

Original Emission Calculator Interface

CO2 Emission Calculator

Distance [km]:

Transportation Mode:

Choose a mode

▼

CO2 Emission:

Calculate

KLM Calculation - Original UI

1. P - Pointing mouse to text-input field for distance (hand is already on mouse)
2. BB - Clicking on distance text-input field
3. H - Moving hand from mouse to keyboard
4. K - DELETE keystroke to remove excess 0
5. 3K - 3 2 4 keystrokes to enter desired distance
6. H - Moving hand from keyboard to mouse
7. P - Pointing mouse from distance text-input field to transportation mode drop-down menu
8. BB - Clicking drop-down menu to open the menu
9. R - System loading menu options
10. M - User thinking about which option to select and where its located
11. P - Pointing mouse to the desired transportation mode from menu
12. BB - Clicking on desired transportation mode
13. P - Pointing mouse to the Calculate button
14. BB - Clicking on the Calculate button
15. R - System calculating and displaying CO2 emission

$$T = 4P + 4BB + 2H + 4K + 2R + M$$

$$T = 4(1.1) + 4(0.2) + 2(0.4) + 4(0.28) + 2(0.3) + 1.35 = 9.07s$$

New Emission Calculator Interface

CO2 Emission Calculator

Distance [km]:

CO2 Emission:

Transportation Mode:

- ☐ Car
- ☐ Bus
- ☐ Motorcycle
- ☐ Train

This UI has eliminated the drop-down menu for the transportation mode, reducing the KLM heavily, because the user does not have to go through the drop-down menu manually. Thus, in the new UI the display of all the transportation modes reduces the KLM by displaying all the possible choices and by reducing an extra click to reveal all the modes. Moreover, the CO2 Emission result will be displayed on the top right corner. This was placed there, so that the

output, thus the data that the user was searching for would not be able to be missed by the user. In addition, the calculate button was placed below the transportation modes, so that the user would be able to access the calculate button with a reduced KLM. This is assumed because the user would have chosen a transportation mode, thus their movement would be going downwards, therefore would reduce the KLM by placing it below the modes rather than to the right hand side, since their direction of movement would have to change if this were the case.

KLM Calculation - New UI

1. P - Pointing mouse to text-input field for distance (hand is already on mouse)
2. BB - Clicking on distance text-input field
3. H - Moving hand from mouse to keyboard
4. 3K - 3 2 4 keystrokes to enter desired distance
5. H - Moving hand from keyboard to mouse
6. P - Pointing mouse to the desired transportation mode radio button
7. BB - Clicking on desired transportation mode
8. P - Pointing mouse to the Calculate button
9. BB - Clicking on the Calculate button
10. R - System calculating and displaying CO2 emission

$$T = 3P + 3BB + 2H + 3K + R$$

$$T = 3(1.1) + 3(0.2) + 2(0.4) + 3(0.28) + 0.3 = 5.84s$$

Works Cited

[1] Littledata. [Online]. Available: <https://www.littledata.io/average/server-response-time>. [Accessed: 11-May-2021].