Keyboard Analysis

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September 2024

Note:

Any given file for the layout should be named 'layout.py' and be present in the directory that the mains script('keyboard.py') is run in.

The python code outputs the distance on the terminal and Heatmap in a file called "keyboard-Heatmap.jpg".
I have included a Heatmap image in the sumbission as an example output.

Objective

Develop a Python program that analyzes keyboard usage patterns for a given text input and a keyboard layout file.
The program should generate a Heatmap visualization of key usage and calculate the total distance traveled by fingers while typing.

Procedure

I first parsed the text to create a key frequency dictionary and used this for all following calculations. To calculate the total distance travelled, I summed the 'calc_distance' function (from the Programming Quiz) over all keys. (have ignored what specific unit it is in)

To create the keyboard Heatmap, I first made an underlying keyboard using 'plt.Rectangle()' and 'plt.add_patch()' methods.
I then created a overlay grid with each coordinate point associated with a frequency it was clicked... A sort of 2D histogram (The only difference being that instead of bars of differing height, its a colour gradient). To create the colour gradient, I used the 'plt.imshow()' method with a specific colormap and interpolation.
Additionally I have set the transperancy of the Heatmap to 50%. I also tried to tinker the scaling to use a form of logarithmic scaling, but reverted back to using the standart linear scaling for the colours.
I have removed the Spacebar from the Heatmap as when analysing larger paragraphs, the Spacebar dominates in key press frequency and creates a dull Heatmap.

Assumptions Made

Since this script accommodates varying layouts, I couldn't assume different sizes for different keys (as this would cause issues if special keys are placed in the middle).
I have assume each key in the given layout has a spacing of 1 unit in horizontal and vertical direction. (Have taken key size as 0.9*0.9)
I have assumed the Spacebar is always hit using the thumb and have hence removed it from the distance calculation