

#WebDevelopment

#LanguageTech

#UI/UX

#TechnicalInnovation

#ProblemSolving

#KeyboardLayout

#ColorCoding

Mutimedia

Title: Type Pinyin Easier

Description: A HTML keyboard that lets you communicate in this cool way: Wǒ xiǎng dú shèjì! This project is individual work.

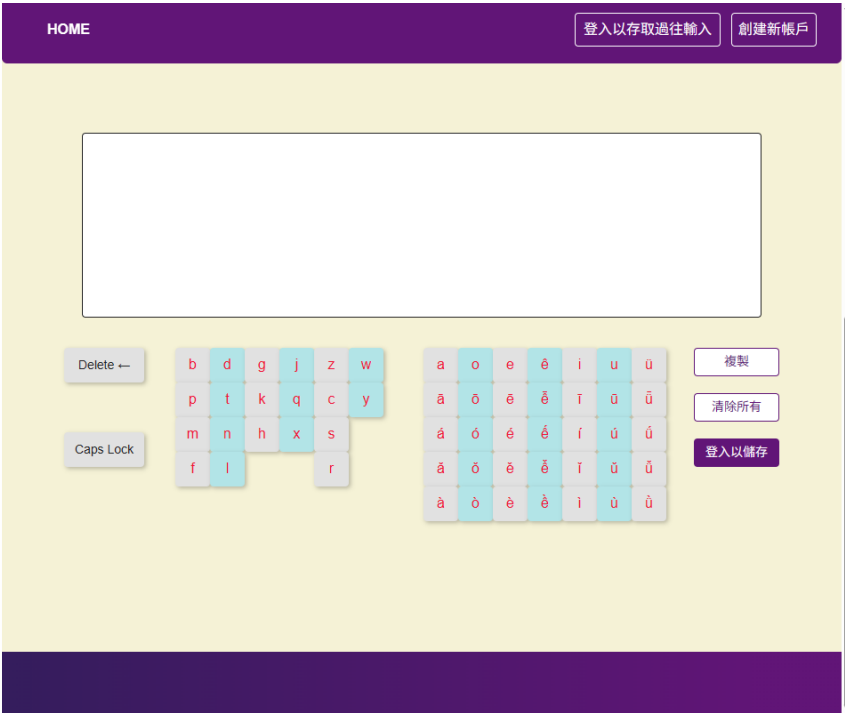
There is currently no clear or widely used solution for inputting pinyin letters with tone marks. In the past, I relied on Word's symbol library to find them, a process that was time-consuming and cumbersome. The library includes most Latin letters, even those not used in pinyin, making it cluttered and difficult to navigate. I explored websites offering pinyin input methods, but none provided a complete keyboard encompassing all required pinyin letters. Some sites only included tone-marked letters, leaving users to input other letters from their own keyboards.

I envisioned a solution: designing a website and writing a program to offer a keyboard containing all pinyin letters. I confirmed the feasibility of a web-based soft keyboard after noticing that, while editing on a Wiki page, a button-based character library allowed one-click insertion of special characters—a proof of concept. Through dedicated effort, I transformed this idea into a functional tool.

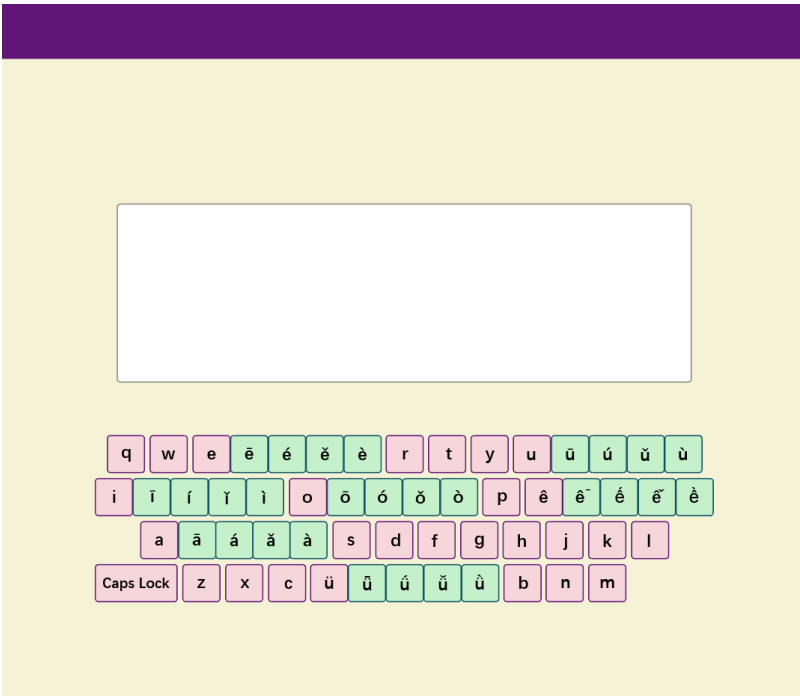
Based on user feedback from questionnaires, the initial version of this solution shone for its clean interface, with well-chosen colors, fonts, and other visual elements, and distinguishable buttons. I selected a soft lemon yellow as the webpage's background color, as the default white was too stark; this gentler hue is easier on users' eyes.

However, one aspect of the interface fell short. Initially, I arranged the buttons according to the BPMF (bopomofo) alphabet, with initials on the left and finals on the right. Yet, during user testing, feedback revealed that users struggled to understand how to use it. Using the Quant UX tool to track user behavior, I observed that users were randomly clicking buttons. Questionnaire responses indicated that the keyboard layout felt unintuitive and confusing. Upon reflection, I realized that for users to recognize the tool as a soft keyboard, its layout needed to visually align with familiar keyboards, rather than resembling a pinyin learning chart. I had assumed that those familiar with Mandarin would find the BPMF order intuitive, expecting it to help them locate buttons easily. Later, I understood that reading a phonetic chart and typing on a keyboard are distinct tasks. Although I initially believed the BPMF arrangement avoided a chaotic or illogical layout, it sacrificed the intuitive usability of the soft keyboard. Users might not have realized it was a keyboard, mistaking it for something with a different function.

Thus, I devised a redesign: placing non-tone-marked letters in strawberry-pink buttons, arranged in the familiar QWERTY keyboard layout. For letters that can carry tone marks (such as those related to pinyin finals), I added a set of avocado-green buttons for tone-marked variants, distinct in color for easy differentiation. I replaced the "v" with the "ü" key, as pinyin does not use "v." In my experience with other pinyin input methods, pressing "v" triggers the input of "ü." I positioned other special letters' buttons nearby. The keyboard layout is designed with horizontal, centered rows; although row lengths vary slightly, the differences are minimal. This approach moved away from the earlier BPMF-based arrangement. Later, I came across the "Keyboard layout" entry on Wikipedia, which aligned with my thinking. In other languages' keyboards, non-English Latin letters (such as those with diacritics) are typically placed adjacent to standard keys. Moreover, most language keyboards based on the Latin alphabet adopted the QWERTY layout, affirming the validity of my redesign.



| Initial Design



| New layout

This project was my School-Based Assessment (SBA) for the Information and Communications Technology subject in the second half of 2024. Due to time constraints and my skill limitations, it only implemented basic typing into an editable text area and case-switching functions (initial version URL: <https://pinyin-letters-easy-typing.liveblog365.com/>). Beyond the improvements identified through testing, I recognized additional ways to better meet user needs, to be implemented after resolving layout issues and refining core functionality.

- Improvement Direction 1: Currently, characters are inserted at the end of the keyboard layout; I have yet to find a way to place them in the middle.
- Improvement Direction 2: The keyboard should offer copy and one-click clear functions, which were part of the initial design but remain unimplemented.
- Improvement Direction 3: Consider adding a space key.
- Improvement Direction 4: Highlighted text should be directly replaced by input from the soft keyboard, mimicking standard keyboard behavior.
- Improvement Direction 5: The input box should remain in a state to accept user input (maintaining focus) during button presses, avoiding the inconvenience of users needing to click the box again to restore the cursor.

#InteractiveDesign

#FlagRecognizer

#GeometricDesign

#TechnicalInnovation

#MindMapping

#Vexillology

#PatternRecognition

#SupervisedLearning

Mutimedia

Title: Flag Pattern Categorization (with AI)

Description: This project's aim is to explore the connections and symbolic meanings behind flag patterns. The AI recognizer part is a group work, but I'll introduce my role in the following content.

The inspiration stems from my observations of flags, noticing their highly categorizable nature—whether it's diagonal stripes, the number of horizontal bands, crosses, or triangles on the left. While flipping through a world flag book, I could pinpoint each flag's defining features and group them, sparking the idea to bring this to an AI project. You can see that flag designs aren't random; they follow patterns that can be systematically organized. This realization drove me to use supervised learning to automate flag recognition and classification, moving beyond manually identifying them in a book.



| Flags with two vertical stripes



| Flags with a saltire (X-shaped cross)

Manual Data Collection and Mind Mapping

To enable automated recognition, I manually collected data, categorizing all UN member states' flags based on their compositional features—like diagonal or horizontal stripes, cross designs, or triangle placements. I compiled these categories into a mind map, visually laying out the shared traits and logical groupings. You'll notice many flags share similar compositions, such as triangles on the left or specific stripe counts, making the classification systematic. Each category was named, and its data was organized into corresponding folders for clarity. This mind map isn't just a tool for AI training; it has room to grow, potentially including non-UN flags or other compositions in the future.

The mind map can be found on the next page.