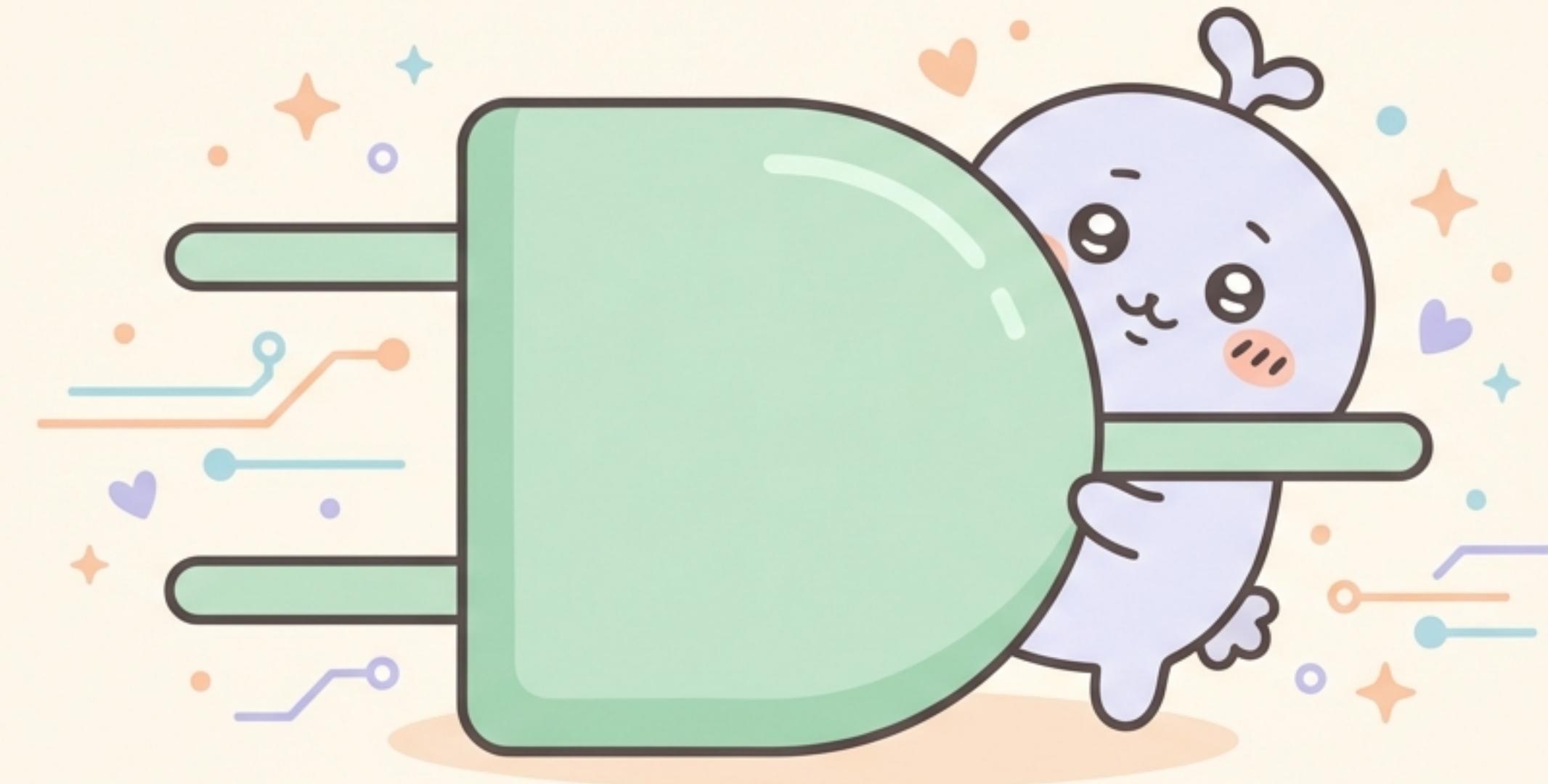


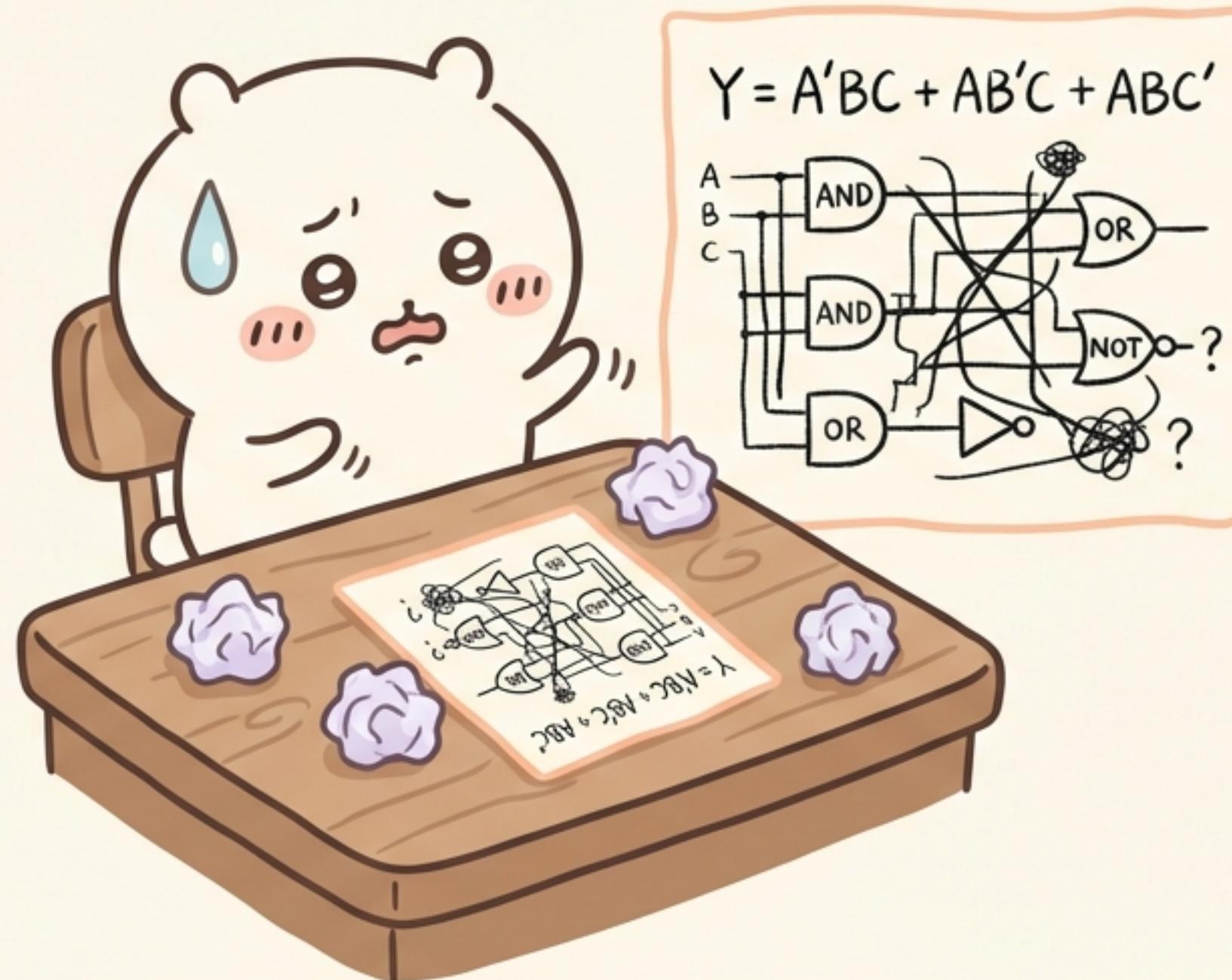
Designing Logic Circuits Can Be Fun!

An introduction to the Logic Circuit Designer (逻辑电路自动生成器)



A tool for students, educators, and electronics enthusiasts.

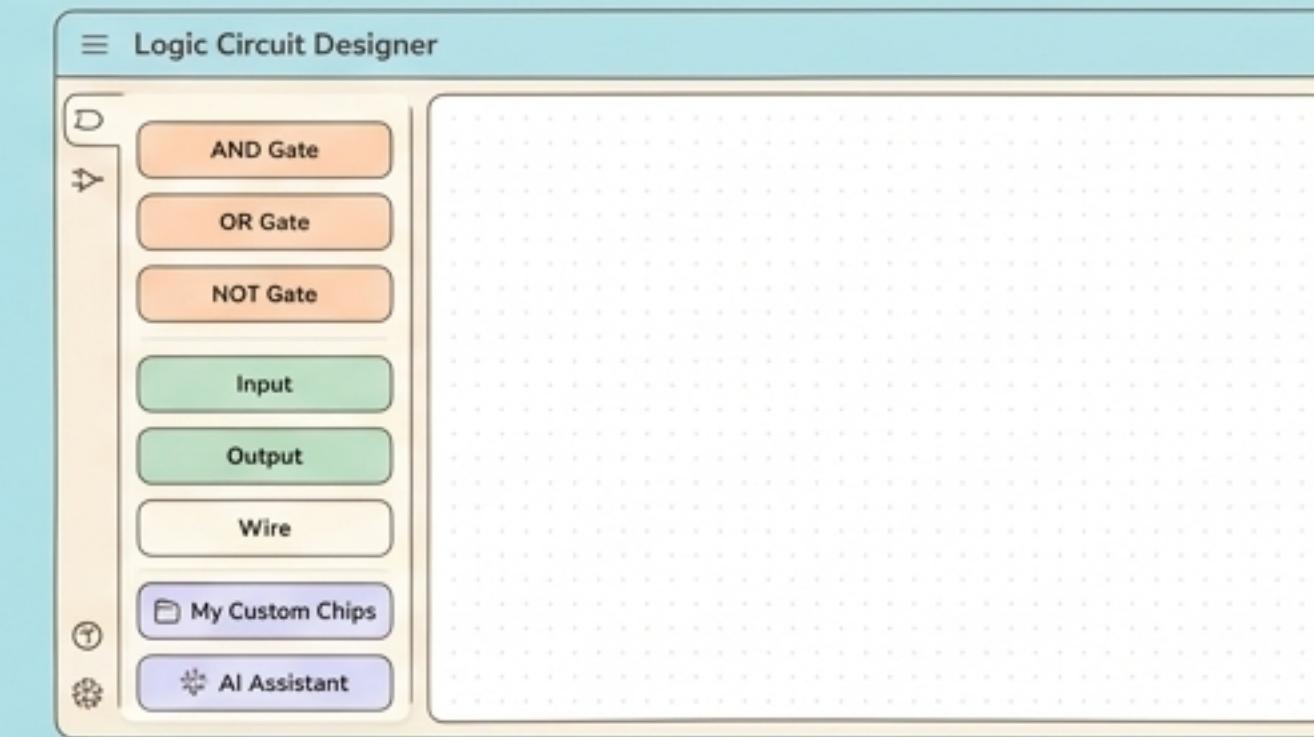
A Scary Formula Appears...



Digital electronics assignments can be tough. Drawing complex circuits by hand is slow, messy, and it's easy to make mistakes. There must be a better way!

(This project started as an auxiliary tool for digital electronics experiments at Zhengzhou University / 郑州大学数电实验辅助工具).

A Helper Appears! Logic Circuit Gen



A React-based, web tool designed to make circuit design simple and intuitive.

-  **Visual Designer:** An intuitive drag-and-drop interface.
-  **Smart Generation:** Instantly create circuits from formulas.
-  **Custom Chips:** Build your own reusable components.
-  **AI Assistant:** Get help with complex, word-based problems.

Let's Try the Basics!

Logic Circuit Designer

The screenshot shows the Logic Circuit Designer application window. On the left is a sidebar with icons for AND Gate, OR Gate, NOT Gate, Input, Output, Wire, and Switch. Below these are buttons for My Custom Chips and AI Assistant, along with standard window controls (minimize, maximize, close) and a help icon.

Add Components: Just drag what you need from the sidebar!

A large orange arrow points from the sidebar towards the workspace.

Wiring: Click a port... then click another to connect them. The wires route themselves (Manhattan style)!

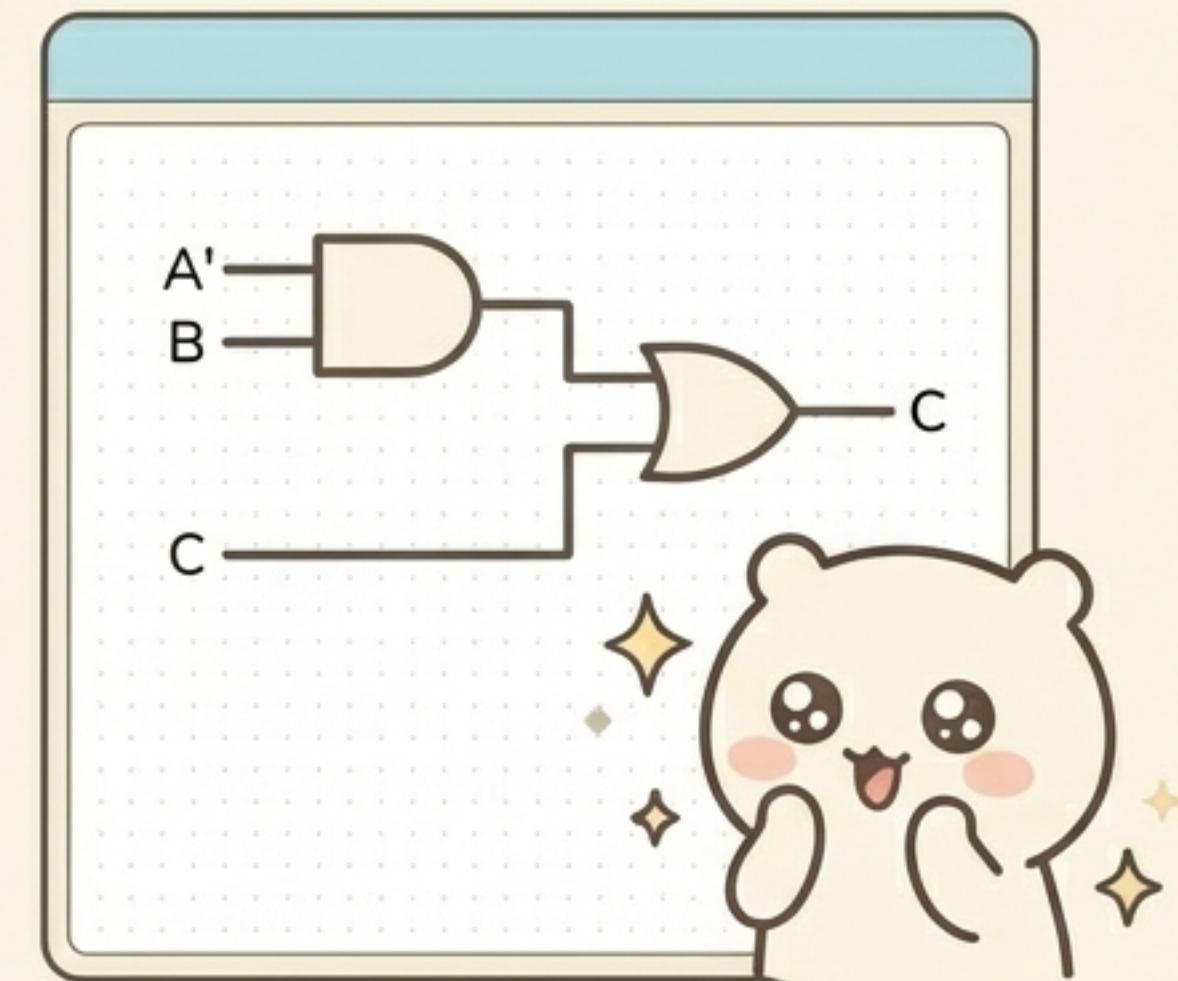
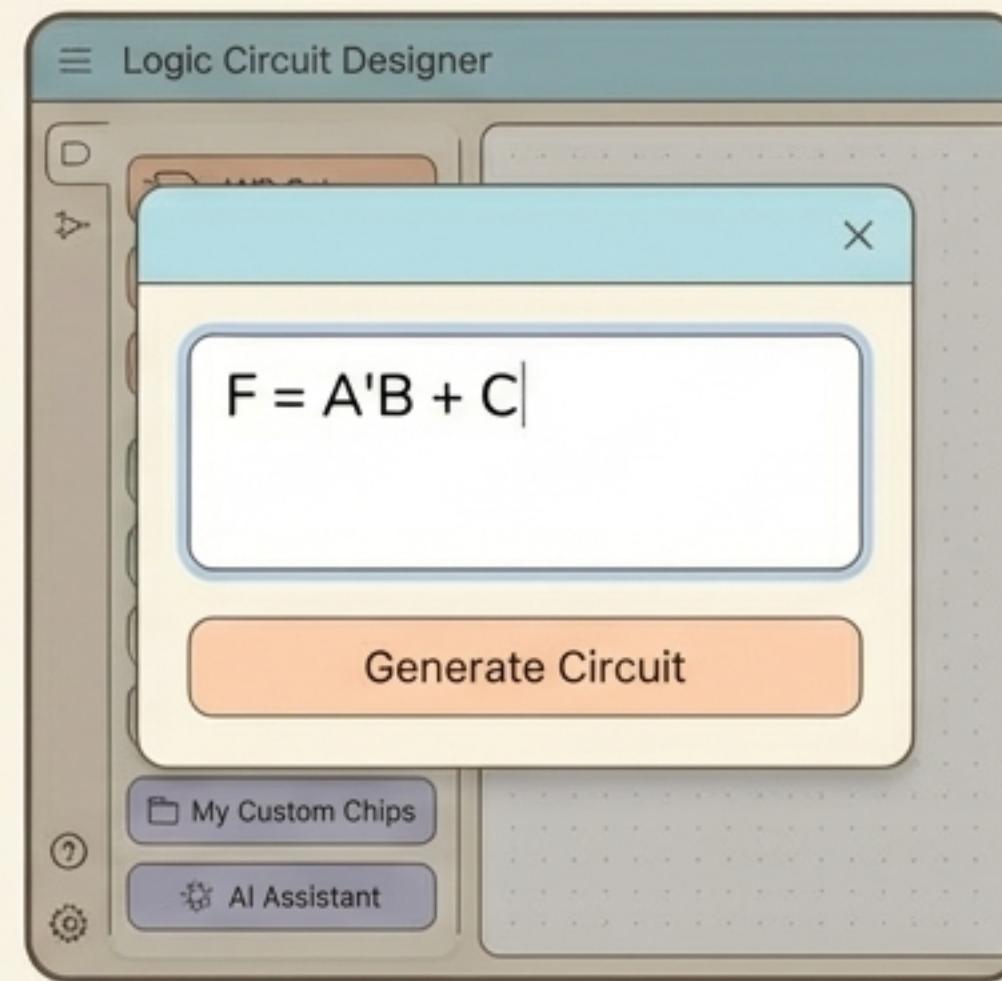
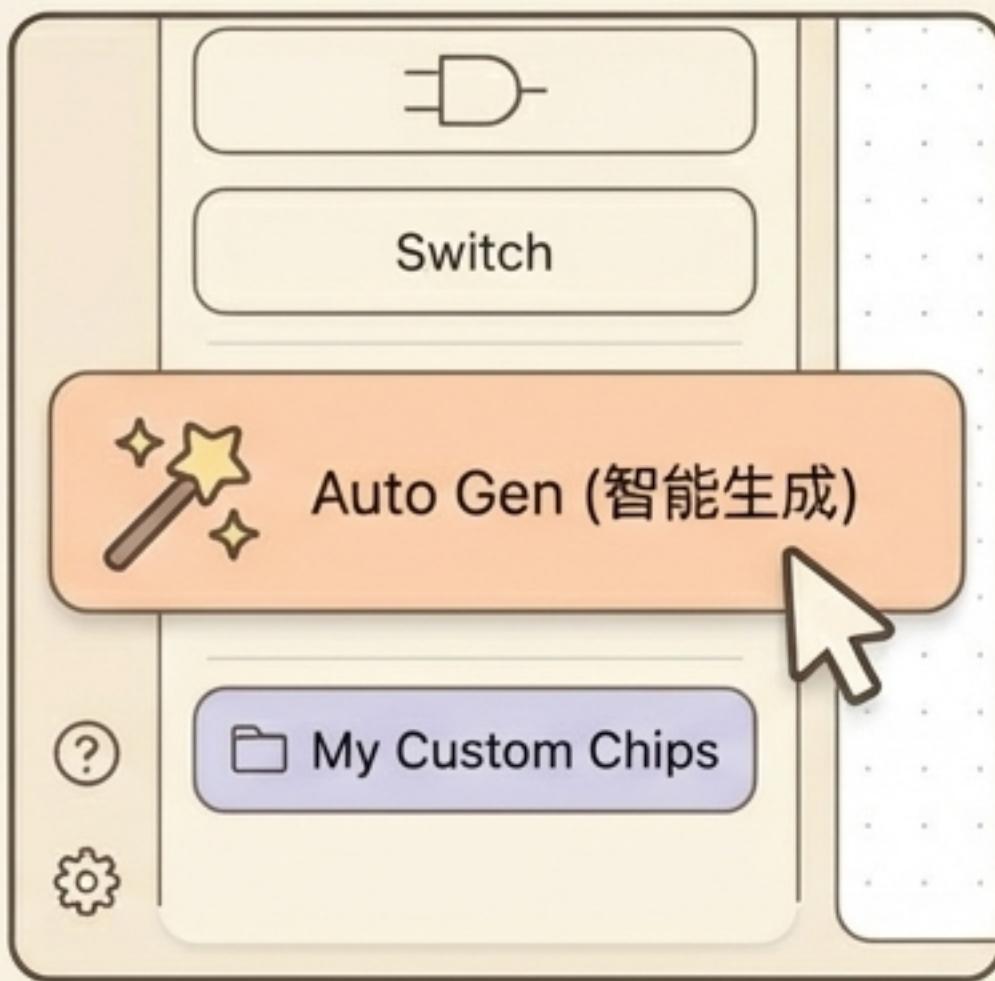
The workspace contains a logic circuit diagram. It features two AND gates connected in series. The first AND gate has its output connected to the second AND gate's first input. Both AND gates have their second inputs connected to a common green circular node. A wire also connects the first AND gate's second input to this same green node. A third wire connects the output of the second AND gate to a switch component labeled "Switch".

Delete: Hover over a component and click the little red icon to remove it.

Navigate: Use your mouse wheel to zoom, and drag on empty space to pan around.

At the bottom of the workspace are icons for search and hand selection.

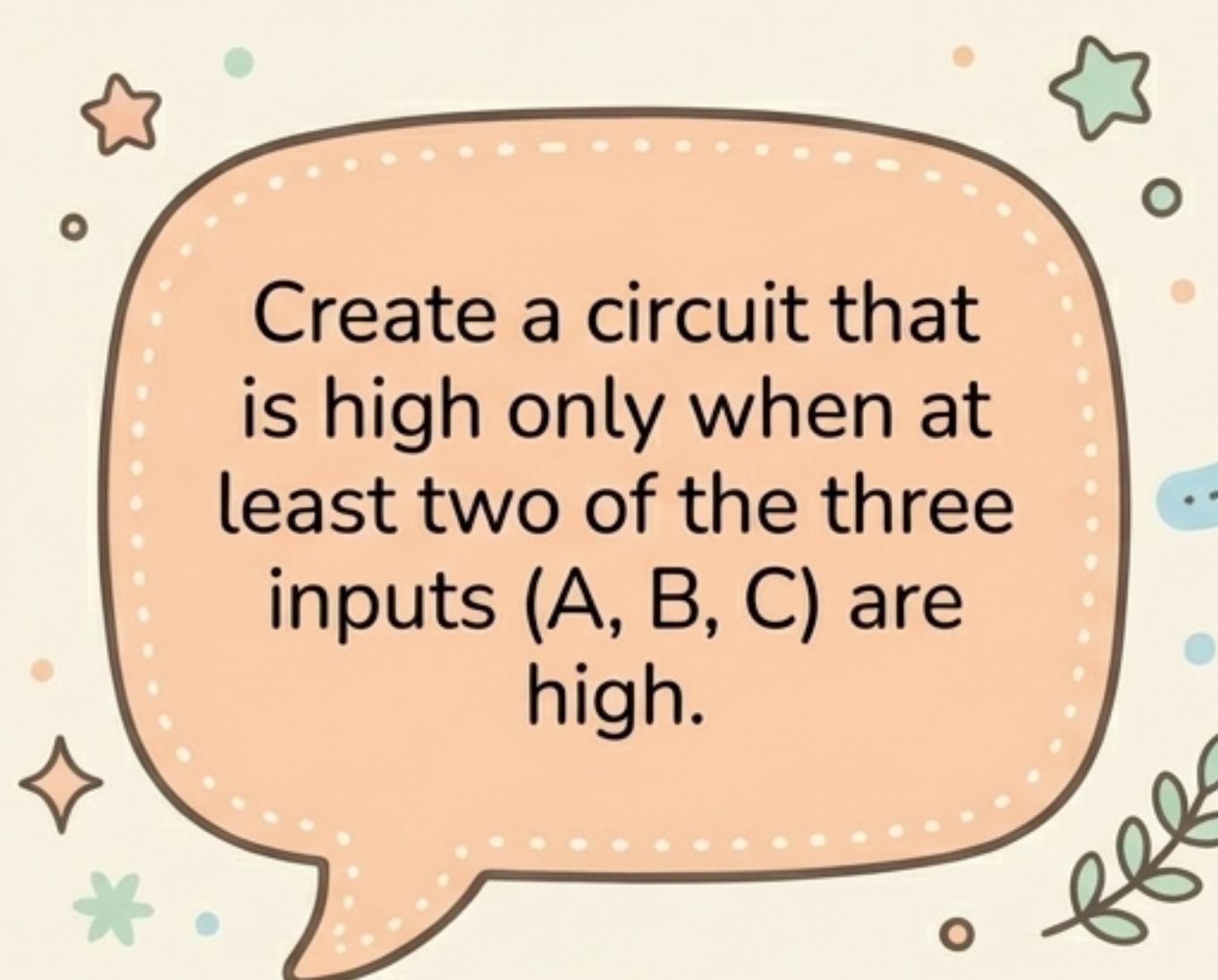
The Magic Wand: From Formula to Circuit in One Click



The 'Smart Gen' feature automatically synthesizes a **complete circuit diagram** from boolean logic expressions. No more manual translation! Just type your **formula** and click 'Generate Circuit'.

What If the Problem is... Just Words?

For complex logic or natural language descriptions, the AI Assistant is your friend.



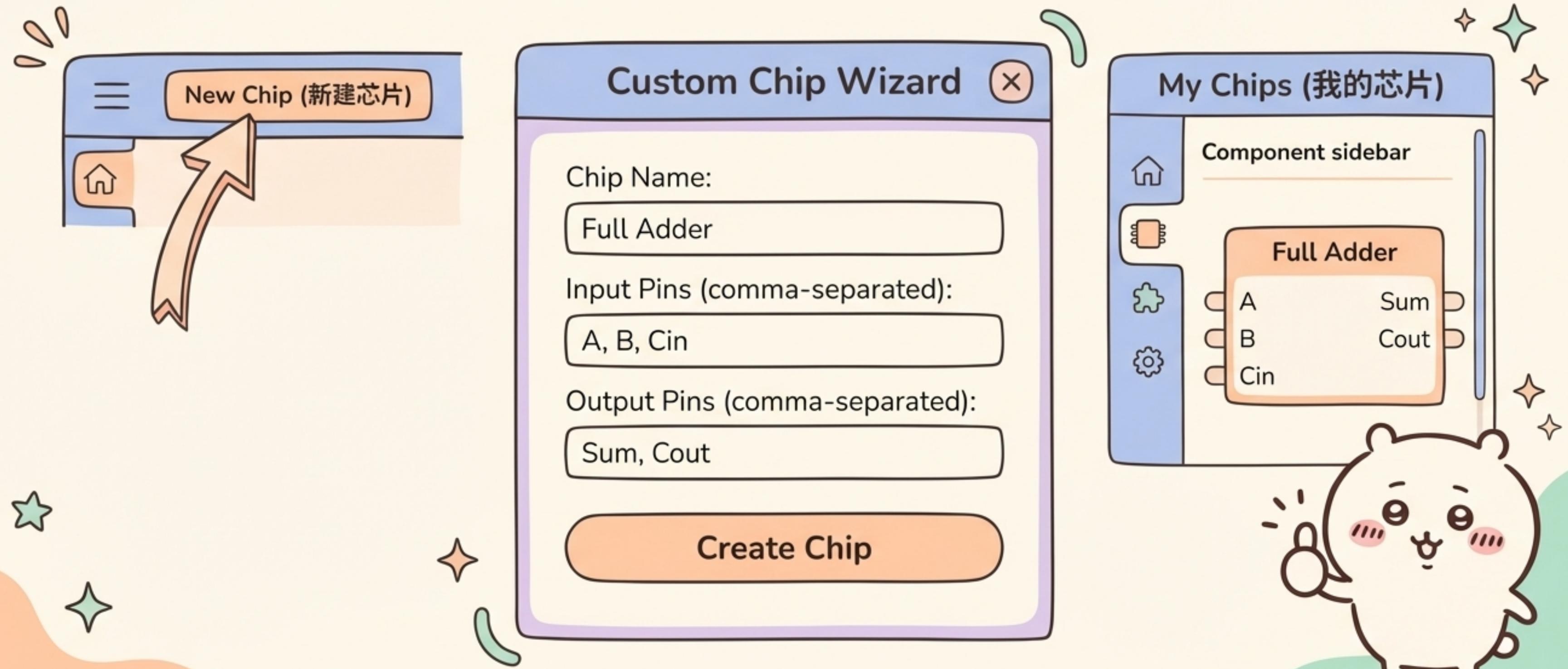
Click 'AI Assistant' inside the Auto Gen panel.

Copy the generated prompt.

Send it to your favorite Large Language Model.

Paste the AI's code back into the generator and create your circuit!

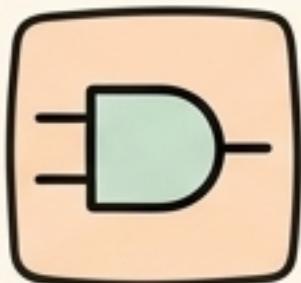
Let's Build Our Very Own Magic Block!



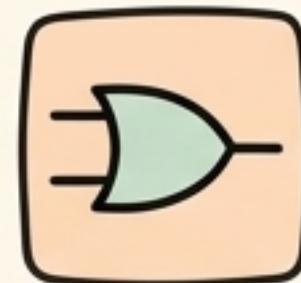


Everything in Your Toolbox: The Component Library

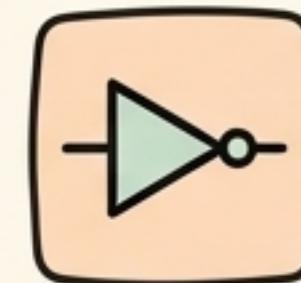
Basic Gates



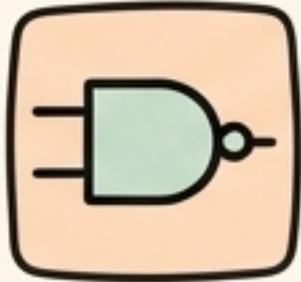
AND



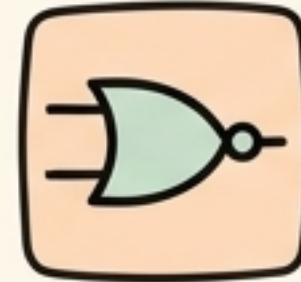
OR



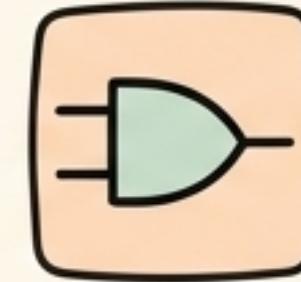
NOT



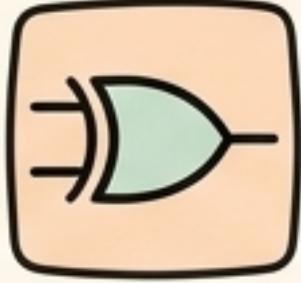
NAND



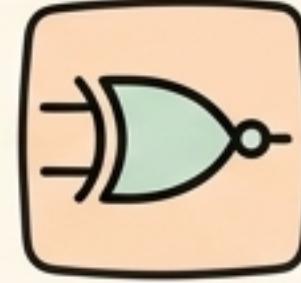
NOR



NEPT

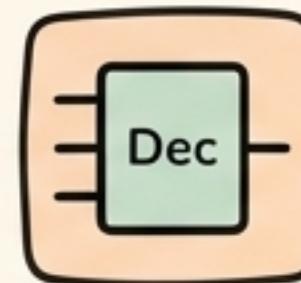


XOR

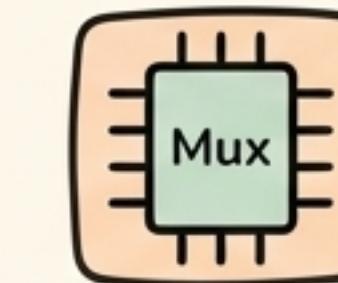


XNOR

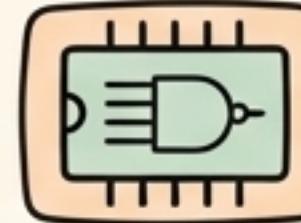
Integrated Circuits (ICs)



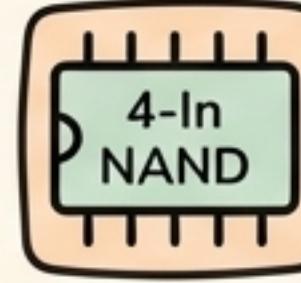
74LS138
(Decoder)



74LS153
(Multiplexer)

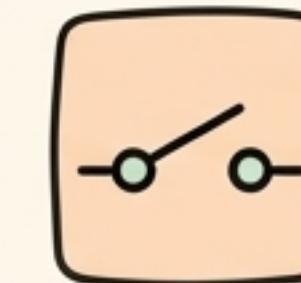


74LS153 (Multiplexer)



4-Input NAND

Input/Output

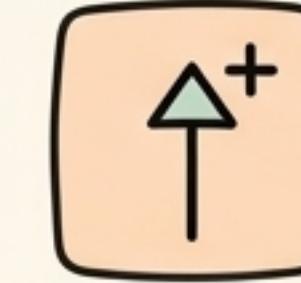


Switches

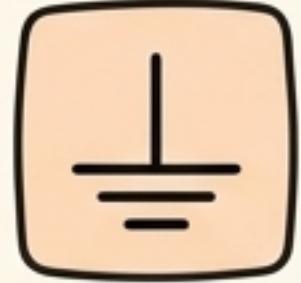


LEDs

Power

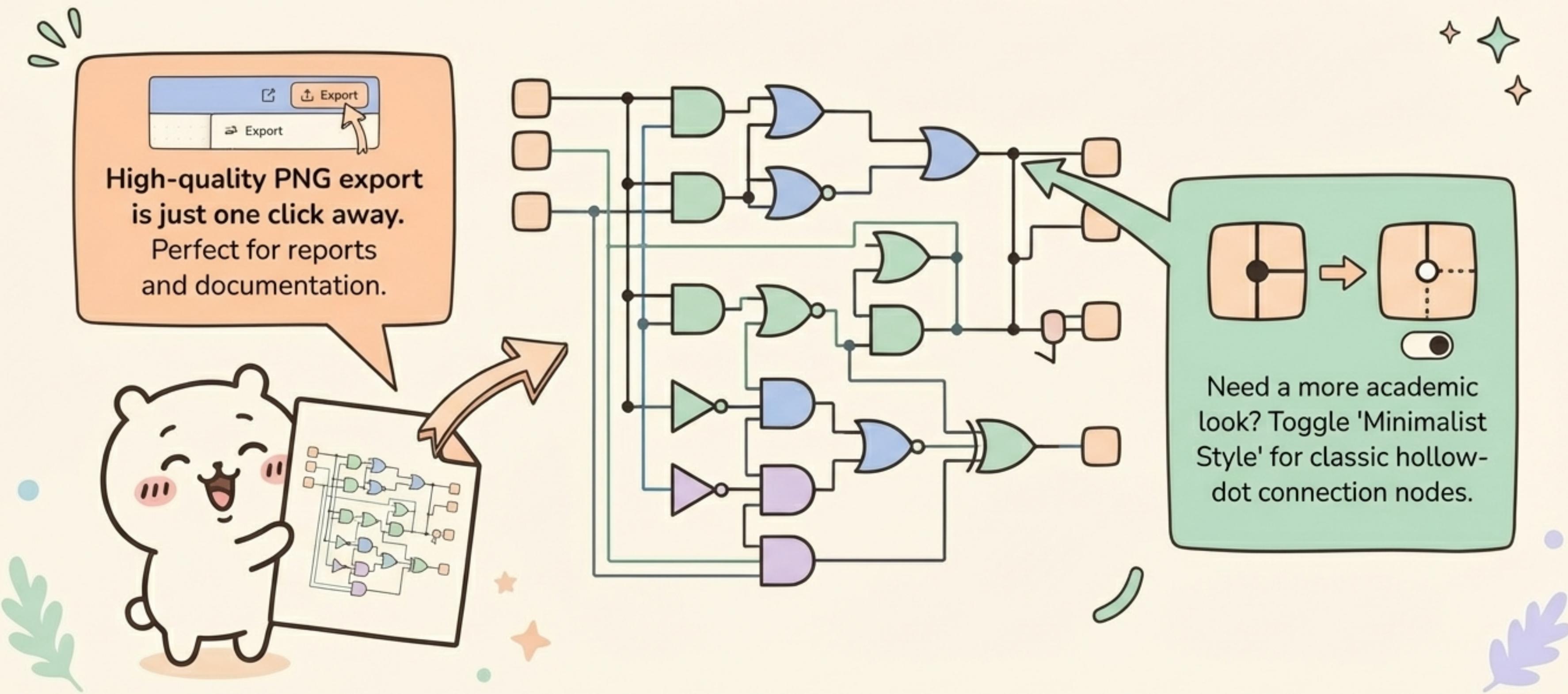


VCC



GND

The Project is Complete! Polished and Ready.



Our Powers, Combined!



Ready to Start Your Own Adventure?

This is an open-source project. You can run it on your own machine in just three steps.

1. Clone the repository

```
git clone https://github.com/budoyh/logic-circuit-designer.git
```

2. Install dependencies

```
npm install
```

3. Run the development server

```
npm run dev
```



github.com/budoyh/logic-circuit-designer



Made with ❤️ by Budoyh (不懂)



This tool was created to help students and hobbyists bring their digital logic ideas to life.



GitHub: budoyh



Email: budo0422@outlook.com



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