**FLOWCHART SIMULATOR**

Building a web page that allows users to create, edit, and visualize flow charts right from their device. Users can add nodes (process steps, decisions, inputs/outputs), link them with directional arrows, and label each connection.

**Key Objectives:**

1. **Flowchart Creation & Editing**

* User clicks on the sidebar containing feature tools to add the shape in the canvas.
* User can move this shape anywhere in the canvas.
* Ability to move or resize nodes and draw directional edges between them.
* Label nodes and edges with short text.

1. **Validation & Feedback**

* Detect potential issues (like unconnected nodes, multiple starts/ends, cyclical paths if undesired).
* Display concise error messages or visual highlights if the flowchart is invalid.

1. **Data Storage (Offline-First)**

* Store flowcharts locally in a lightweight format (e.g., JSON or a small database).
* Support creating multiple flowcharts, each saved with a title or tags.
* Optional export/import of flowcharts as files to share with others or back up.
* Any checks (cycle detection, layout updates) should be quick to avoid stutters.

1. **Usability & UI/UX**

* Clear, intuitive design for placing and linking nodes on a canvas.
* Zoom and pan gestures for navigating large flowcharts.

**Additional Objectives (Optional):**

1. **Execution or Simulation**

* Let users “simulate” their flowchart by starting at the initial node and following decision paths, possibly prompting for user input on branches.
* Show a step-by-step trace or highlight the active node as the simulation runs.

1. **Optional Advanced Features**

* Node Templates: Predefined shapes for Start/End, Decisions, Processes, etc.
* Auto-Layout: Automatically arrange nodes to minimize edge crossing or cluster related nodes.
* Collaboration: (Advanced) Sync or share flowcharts over LAN/Wi-Fi Direct, merging edits if desired.

**INTIAL UI DRAFT**

