Tree View

Overview

Design a visual tree-structure renderer that displays hierarchical data with clean spacing, clear parent-child relationships, and intuitive interactions. The visualizer should render nodes without overlap, center parents above children, and support expansion/collapse of subtrees.

Use React Flow.

Core Features

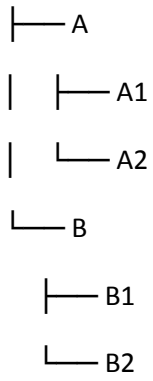
The visualizer must include:

1. Proper tree layout with calculated spacing between siblings
2. Parent node centered above its entire group of children
3. Edges connecting parent and child nodes
4. Expand/Collapse functionality for any node with children
5. Smooth recalculation of layout when collapsing or expanding

Example Scenario

Given this tree:

Root



The visualizer must:

- Draw Root centered above A and B

- Draw A and B spaced cleanly

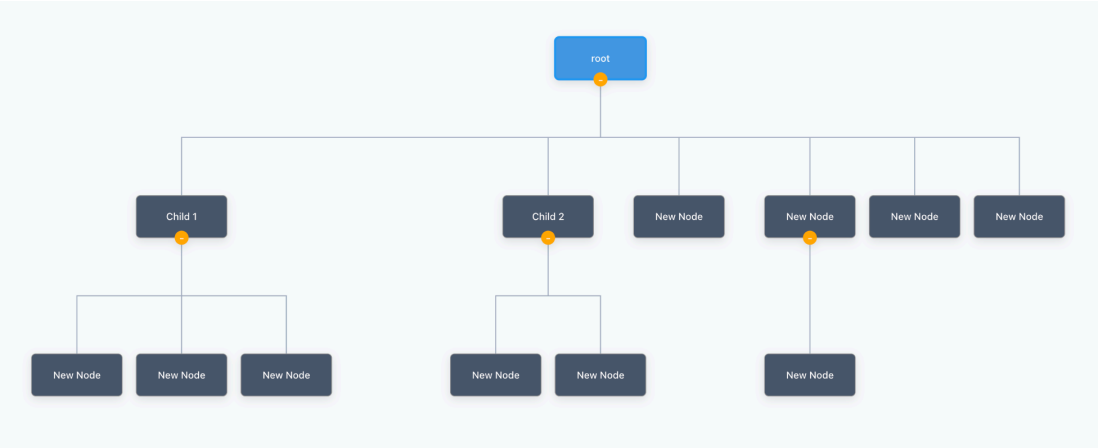
- Draw A1/A2 and B1/B2 centered under respective parents

- Allow collapsing A to hide A1 and A2

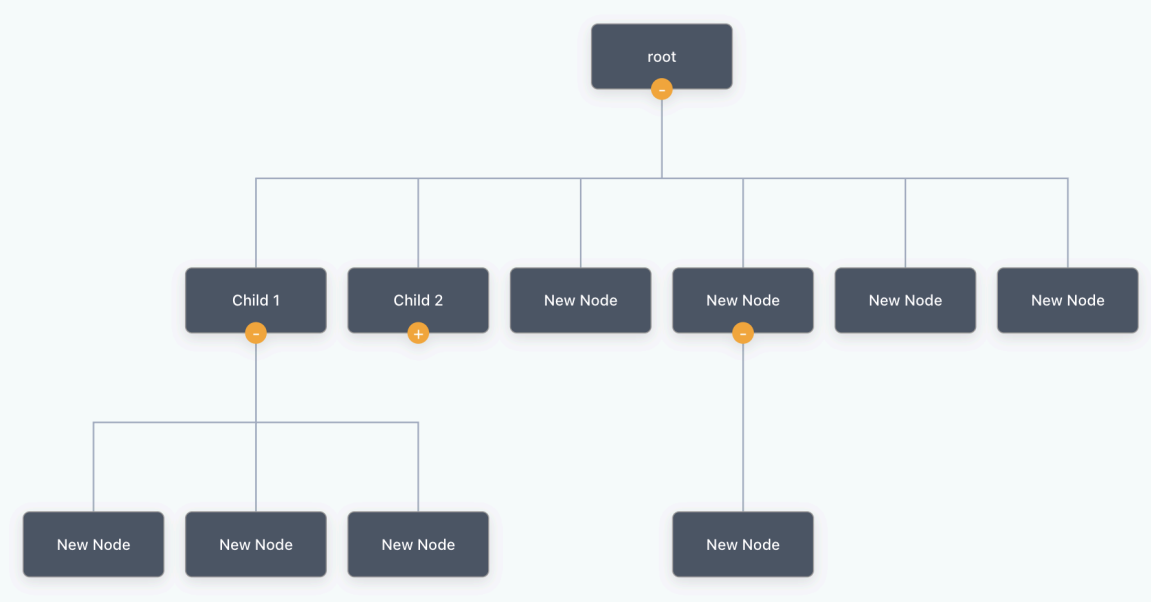
- Adjust spacing automatically after collapsing

Expand Collapse Example:

Initial Tree :-



After Collapsing a Node :-



Constraints

- Tree depth 3–6 levels
- No backend required; fully client-side
- Simple spacing logic acceptable; no need for complex algorithms
- Performance optimization not required

Bonus Challenges

- Hover highlighting or selection

- Simple expand/collapse animations
- Node metadata display
- Search + highlight
- Auto-pan or zoom for large trees

Deliverables

Primary deliverable:
GitHub repository containing the backend project implemented in a suitable framework (for example, Node.js/Express or Python/Flask). The repository should include clear setup and run instructions.

Optional deliverable:
A short demonstration (maximum 2 minutes) in CLI or Postman showcasing the API endpoints and a sample scheduling flow. This demo is optional and may be provided as a short video or a Postman collection with example requests.