Sorting Visualizer - Documentation

About the Project

Sorting Visualizer is a front-end-only application developed to visually represent how sorting algorithms process data.

Features

- Visualizes Bubble, Selection, Insertion, Merge, Quick, and Heap Sort
- Soft pink theme
- Real-time animation
- Responsive layout

Tech Stack

- HTML5
- SCSS (CSS)
- JavaScript (ES6+)

Installation & Setup

Clone the repository:

```
git clone https://github.com/mounikapatharlapalli/Sorting_Visualizer.git
cd Sorting_Visualizer
```

Open index.html in browser.

File Structure

```
Sorting_Visualizer/
 index.html
 style.scss
 style.css
 script.js
```

Sorting Visualizer - Documentation

README.md

User Guide

1. Open web page
2. Adjust array size and speed
3. Select sorting algorithm
4. Watch animation
5. Regenerate array to try again

Bubble Sort

Repeatedly compare and swap adjacent elements if they are in the wrong order. Largest bubbles up.

Time: O(n^2) Worst, O(n) Best

Space: O(1)

Selection Sort

Find smallest element in unsorted part and place it at the start.

Time: O(n^2)

Space: O(1)

Insertion Sort

Insert elements into correct position in a growing sorted part.

Time: O(n^2) Worst, O(n) Best

Space: O(1)

Merge Sort

Divide array into halves, sort recursively, then merge.

Time: O(n log n)

Space: O(n)

Sorting Visualizer - Documentation

Quick Sort

Choose a pivot, partition array around it, recursively sort partitions.

Time: O(n log n) avg, O(n^2) worst

Space: O(log n)

Heap Sort

Build max heap, extract max repeatedly and heapify.

Time: O(n log n)

Space: O(1)

Future Enhancements

- Add more algorithms
- Pause/Resume
- Complexity panel
- Dark mode
- Sound effects

Contributing

1. Fork repo
2. Create feature branch
3. Commit changes
4. Push branch
5. Submit pull request

License

MIT License free for personal and educational use.