“Performance Optimization Report”

Introduction:

This project focuses on optimizing the performance of a React-based website by minimizing HTTP requests, optimizing assets, lazy loading images, and deferring JavaScript. The primary goal is to enhance the user experience by ensuring fast load times and smooth interactions.

Initial Analysis:

Initial Lighthouse Scores

Category	Score
Performance	82
Accessibility	86
Best Practices	100
SEO	100

Major Issues Identified

- Large render-blocking JavaScript files
- Unoptimized images contributing to slow load times

Optimization Steps:

1. Minimizing HTTP Requests:

- Combined CSS and JavaScript files to reduce the number of requests.

```
javascript
Copy code
// Example of combining JS files
import './combined.css'; // Combined styles
import './combined.js'; // Combined scripts
```

2. Image Optimization:

- Compressed images using next-gen formats (e.g., WebP) and implemented lazy loading.

```
javascript
Copy code
// Example of lazy loading images
<LazyImage src={optimizedImage} alt="Optimized Image" loading="lazy" />
```

3. Deferring JavaScript:

- Defer the loading of non-critical JavaScript to enhance performance.

```
html
Copy code
<script src="your-script.js" defer></script>
```

Final Analysis:

Final Lighthouse Scores:

Category	Score
Performance	90
Accessibility	91
Best Practices	100
SEO	100

Comparison of Scores:

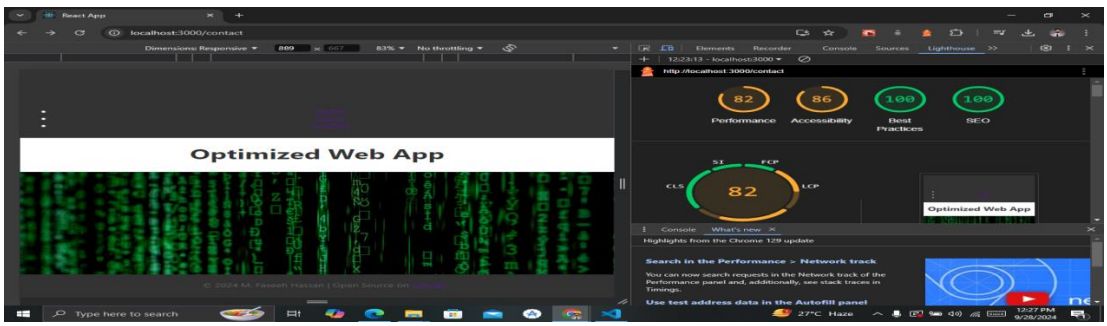
The optimizations resulted in significant improvements across all categories, particularly in performance and accessibility.

Conclusion:

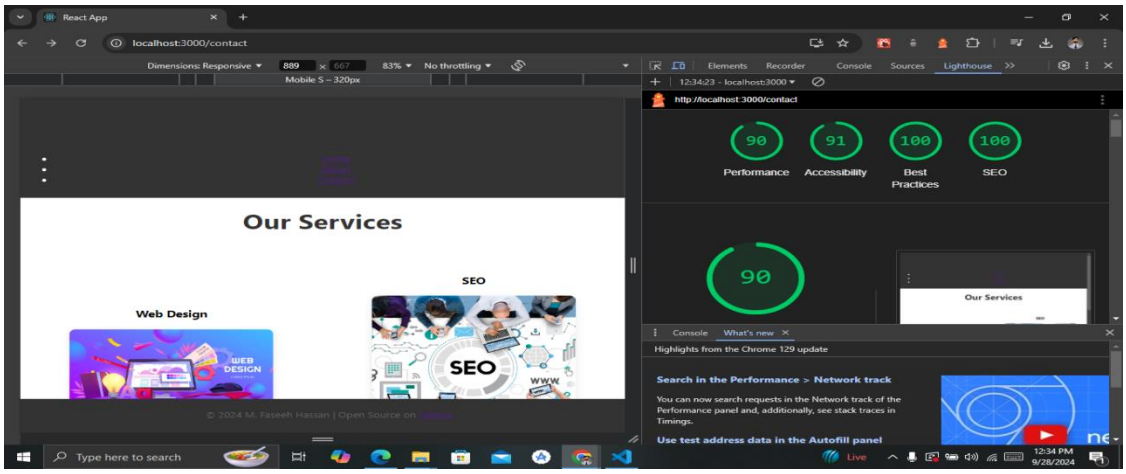
The optimization process effectively improved the website's load time, reduced HTTP requests, and enhanced user experience. The implementation of lazy loading component and image optimization, along with the deferral of JavaScript, contributed to a more efficient and user-friendly web application.

Screenshots

- **Initial Lighthouse Audit Report**:



- **Final Lighthouse Audit Report**:



Code Changes

- Include relevant code snippets to showcase the changes made during the optimization process.
- First I used jpg images and after I used webp images of better optimization.