# Ray Tracing Report Template

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## 1 Introduction

Give a brief introduction for the report. What is it about? What Optimizations have you made? Have you tried something else as well?

## 2 Experimental setup

Give specifications about the system on which the optimizations were bench-marked. Ensure that the benchmarks are consistent with each other (same system, same settings etc).

## 3 Baseline

### 3.1 Description

Give a brief description about the baseline system, what stands out to you? Are there peculiarities or specific design choices which catch your eye?

### 3.2 Profiling

Profile the baseline system, specify how you did it and what tools you used? Report on your insights based on the profiling. What stands out and what surprises you. Include figures

## 4 Optimization I

### 4.1 Description

Describe the section of code you are planning on optimizing on a high level, why did you choose this specific section/method?

### 4.2 Estimation

Estimate how much of an impact the optimization will have on the total run time, perhaps you changed a method from running $O(n^2)$ to $O(n)$. You are free to provide other justifications for your estimations as long as they are coherent and make logical sense.

### 4.3 Profile/ Benchmark

Benchmark your code after implementing the optimization. Is there an improvement? Is the scale of improvement in line with your expectations from the estimation section? If not speculate on why that could be. Provide appropriate figures and tables

| Total execution time in seconds | |
|---|---|
| *Baseline* | 11.206752 |
| *Optimization* | 3.9398673 |

Table 1: an example table

### 4.4 [Optional] Design and implementation

Do you think your method of implementing the optimization was especially novel or interesting? this is the section where you can go into more detail

## 5 Optimization II

For every new method you find to improve the codebase, you should report on how it improved the code compared to a previous version instead of simply against the baseline. Thus compare Optimization II vs the system Optimization I already in place and so on for subsequent optimizations.

### 5.1 Description

### 5.2 Estimation

### 5.3 Profile/ Benchmark

## 6 Optimization III

### 6.1 Description

### 6.2 Estimation

### 6.3 Profile/ Benchmark

## 7 Optimization IV

### 7.1 Description

### 7.2 Estimation

### 7.3 Profile/ Benchmark

## 8 Optimization V

### 8.1 Description

### 8.2 Estimation

### 8.3 Profile/ Benchmark

## 9 Optimization VI

### 9.1 Description

### 9.2 Estimation

### 9.3 Profile/ Benchmark

## 10 Conclusion

Wrap up the report in a neat conclusion. Provide the total improvement post all of the optimizations. Mention briefly what ended up performing according to expectation and what did not. Optionally if you want, you can provide future direction you would suggest exploring for additional improvements and why. [1][2]

## References

[1] Donald E. Knuth. Literate programming. *The Computer Journal*, 27(2):97–111, 1984.

[2] Frank Mittelbach, Michel Gossens, Johannes Braams, David Carlisle, and Chris Rowley. *The LaTeX Companion*. Addison-Wesley Professional, 2 edition, 2004.