Ray Tracing

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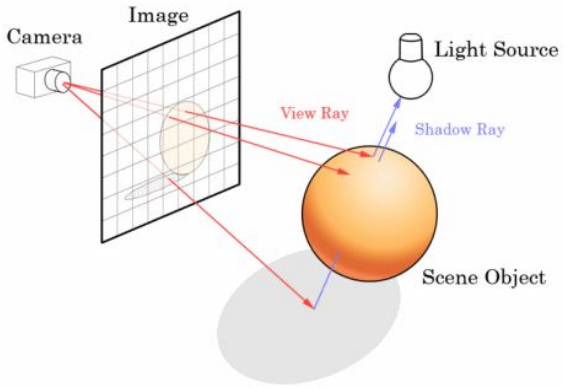
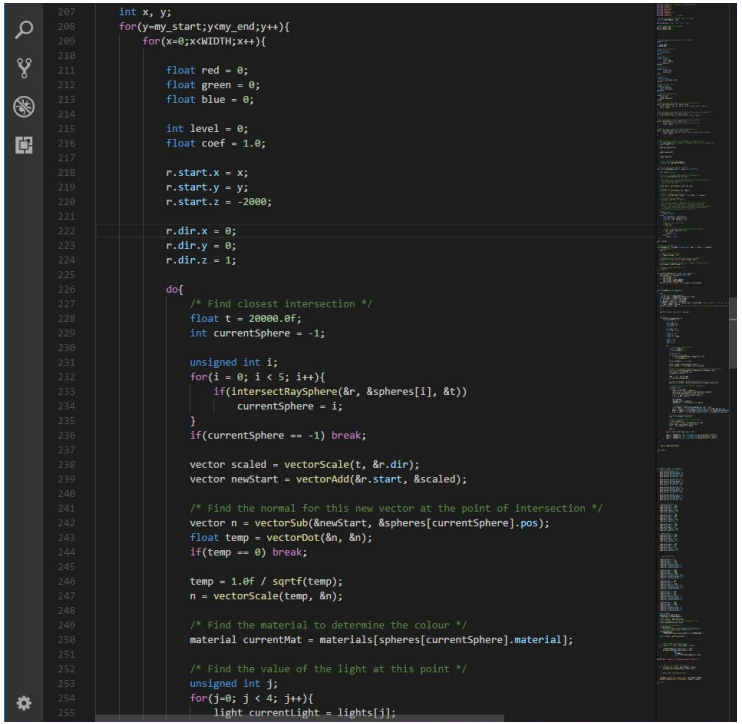
What is Ray Tracing



- Computer Graphic Rendering Technique
- Traces the path of light as pixels in an image plane
  - Simulates the effects of the rays on objects
- Has a high level of realism
  - Simulates variety of optical effects (reflection, refraction, scattering etc.)
- High computational cost
- Good For ahead of time rendering
  - Movies
  - Television
  - Special Effects
- Bad For real time rendering
  - Video games

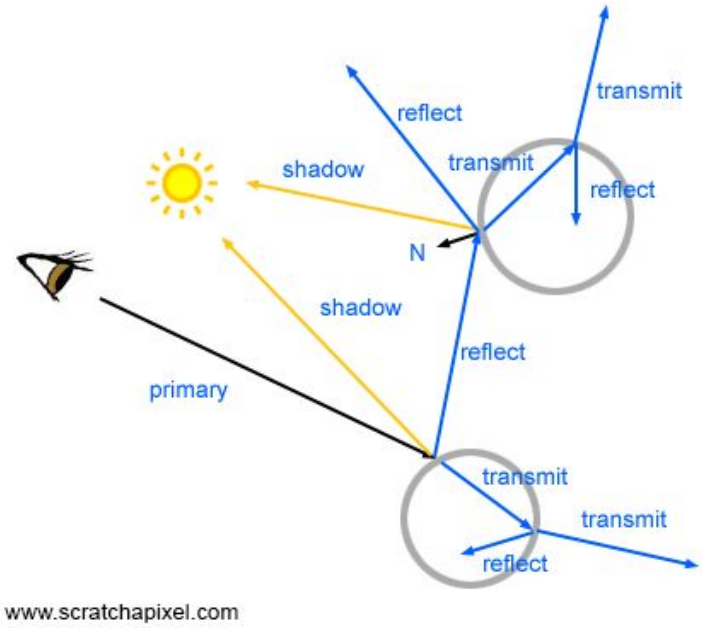
Design of Parallel Solution

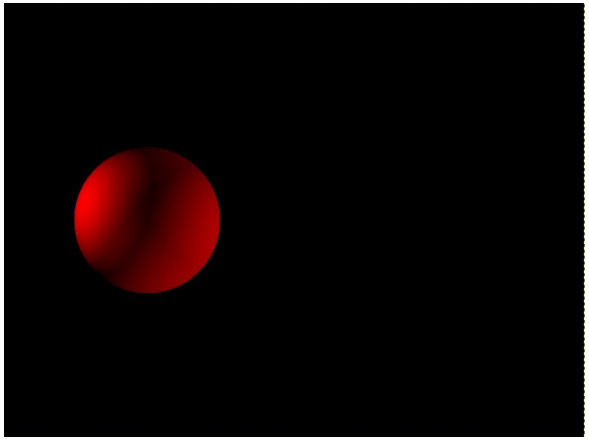
- Pthreads
- Raw image stored in a single array to be written to a file
  - `unsigned char img[3*WIDTH*HEIGHT];`
- Each thread accesses a part of the array to write the data to the array
  - `for(y=my_start;y<my_end;y++){`
  - `for(x=0;x<WIDTH;x++){`
- No need for critical sections

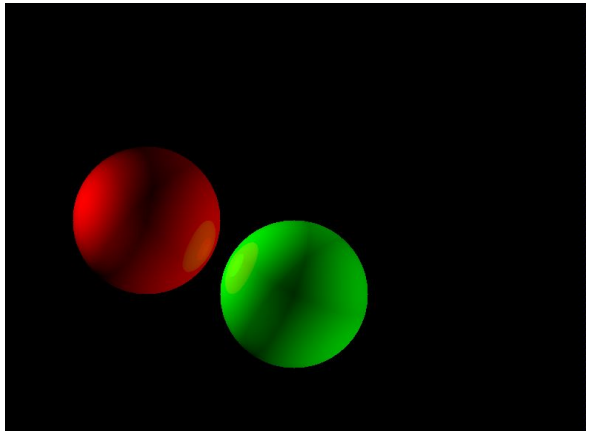


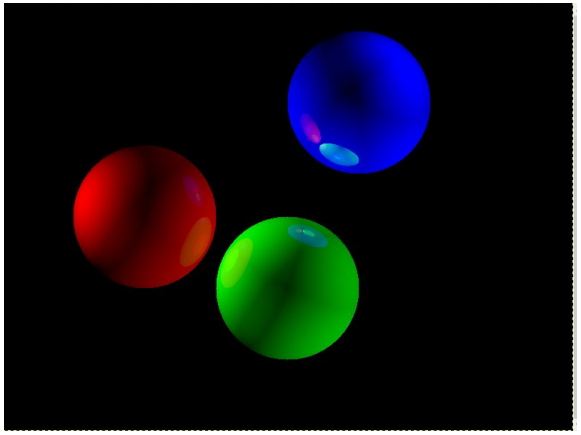
Experiments

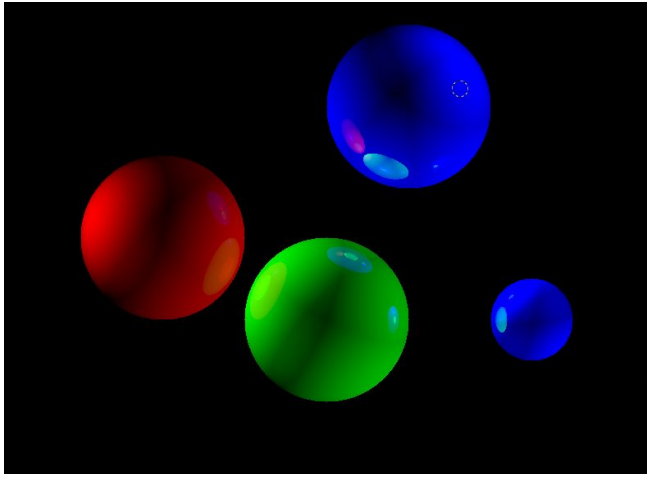
- Collect the timing data for different variations of the program to run with thread counts
  - Different Ball Counts
  - Different Lighting sources

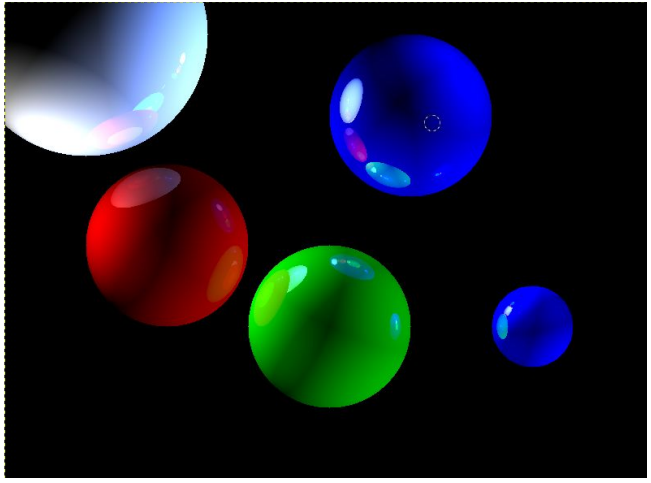


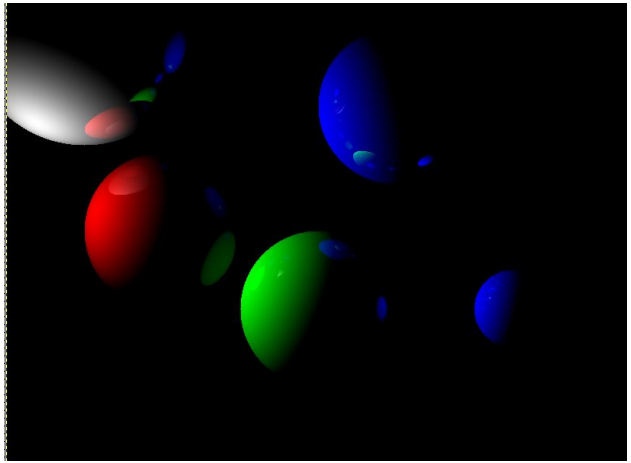
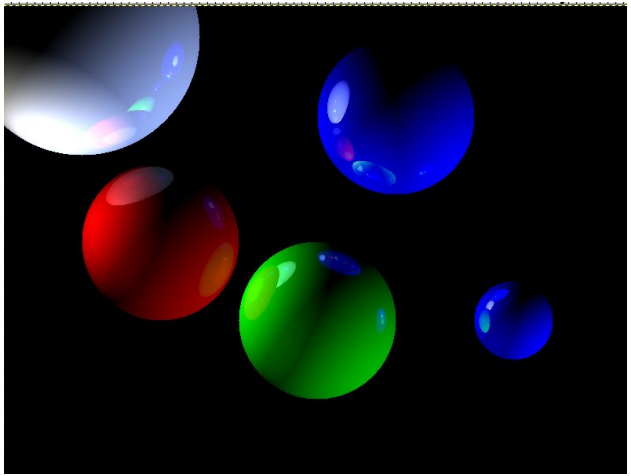
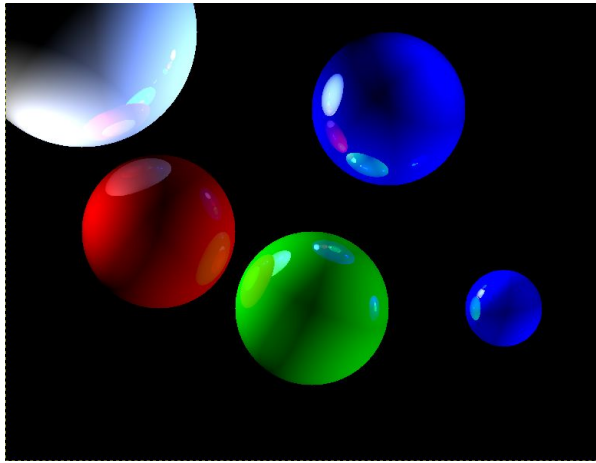
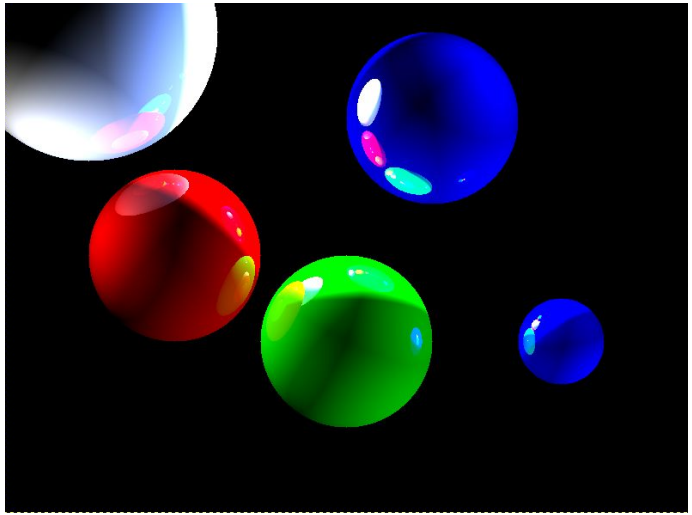
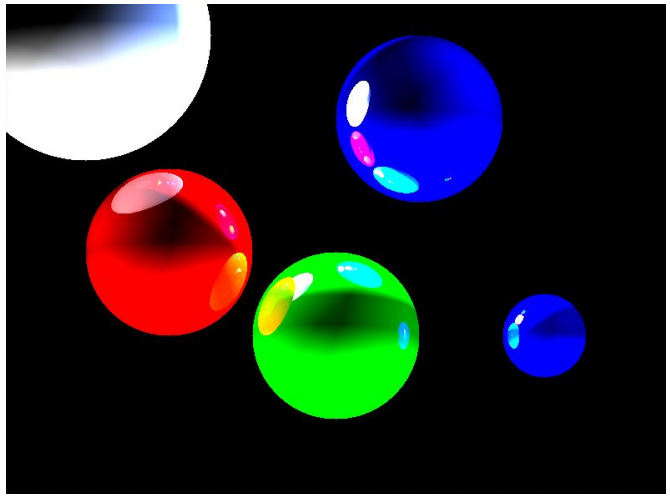




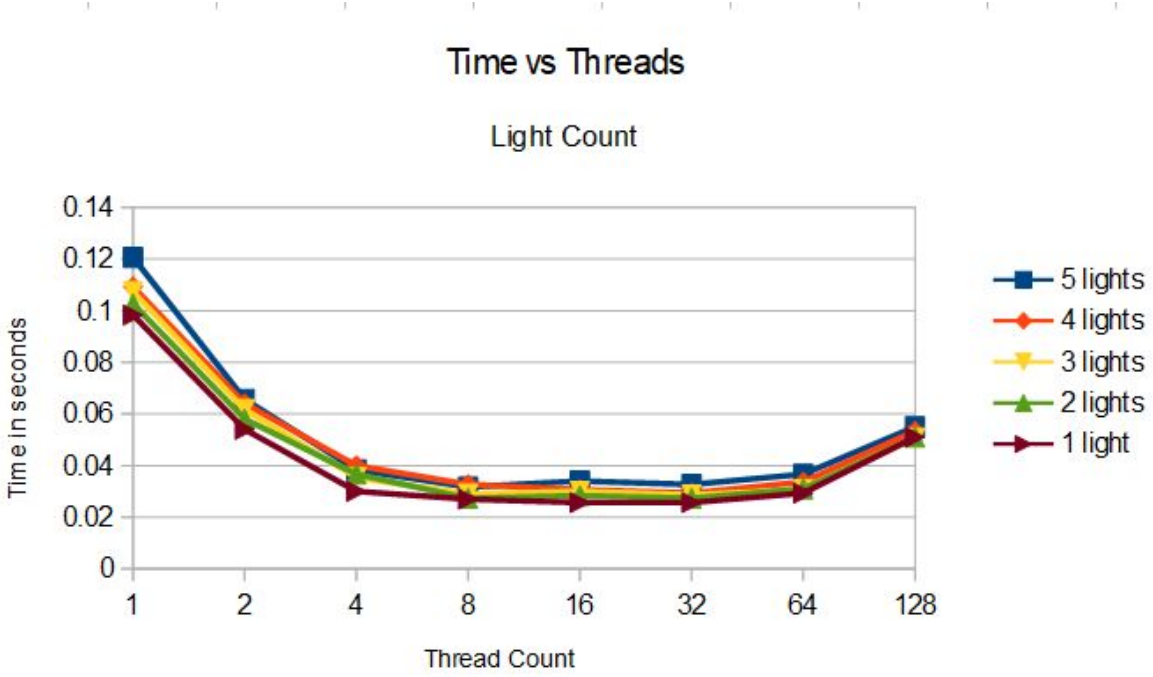






Analysis of Results



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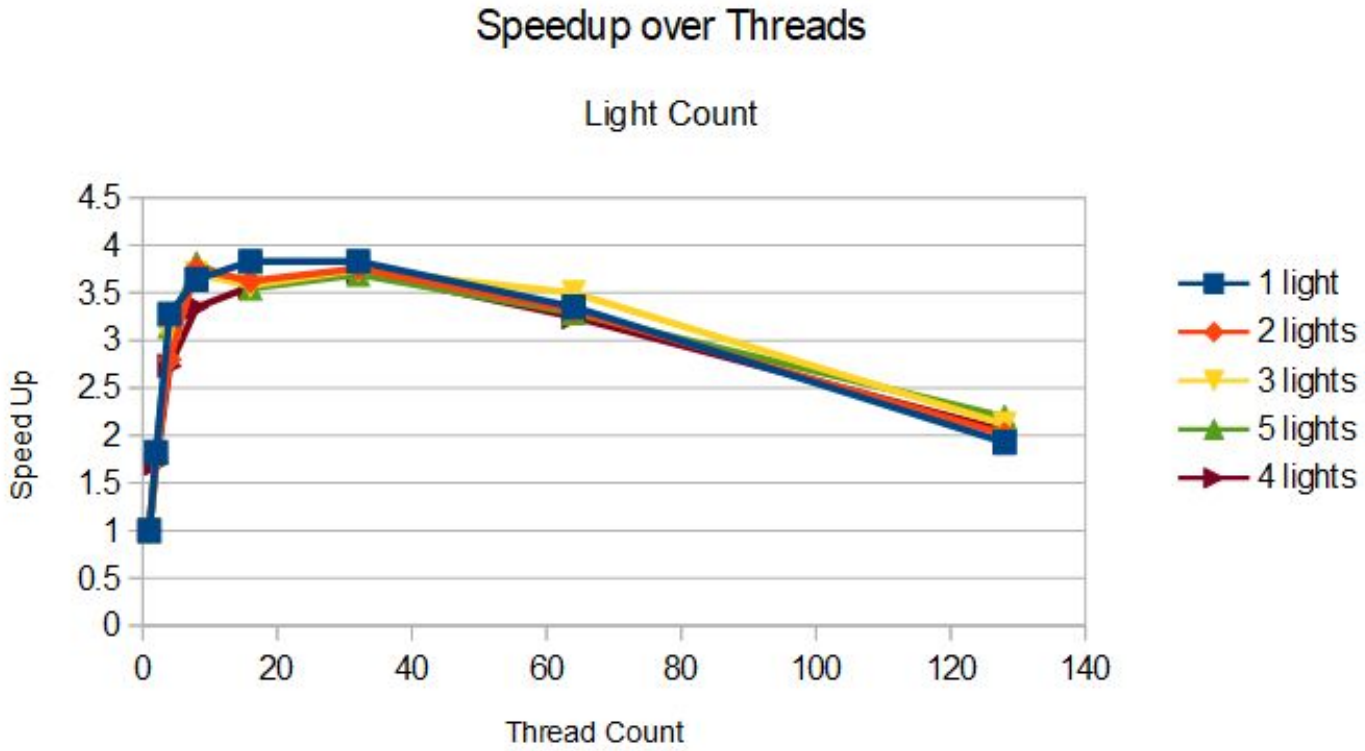

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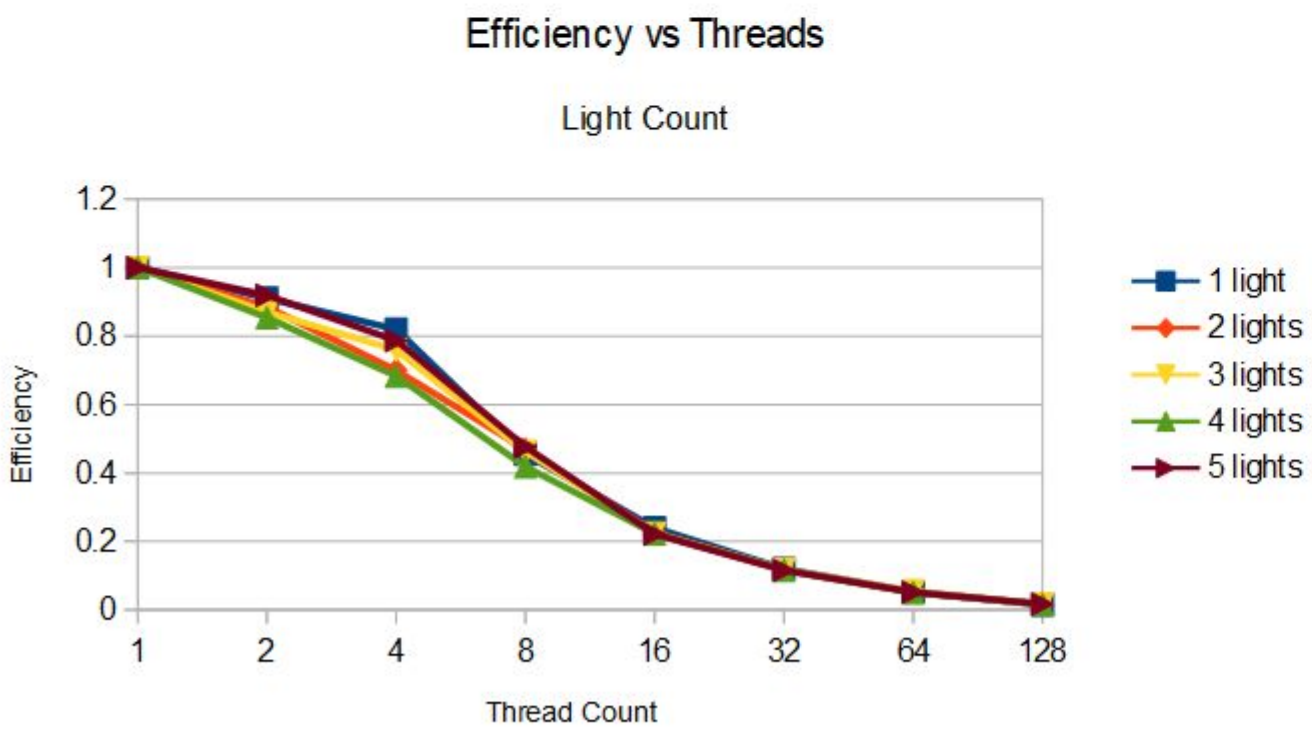

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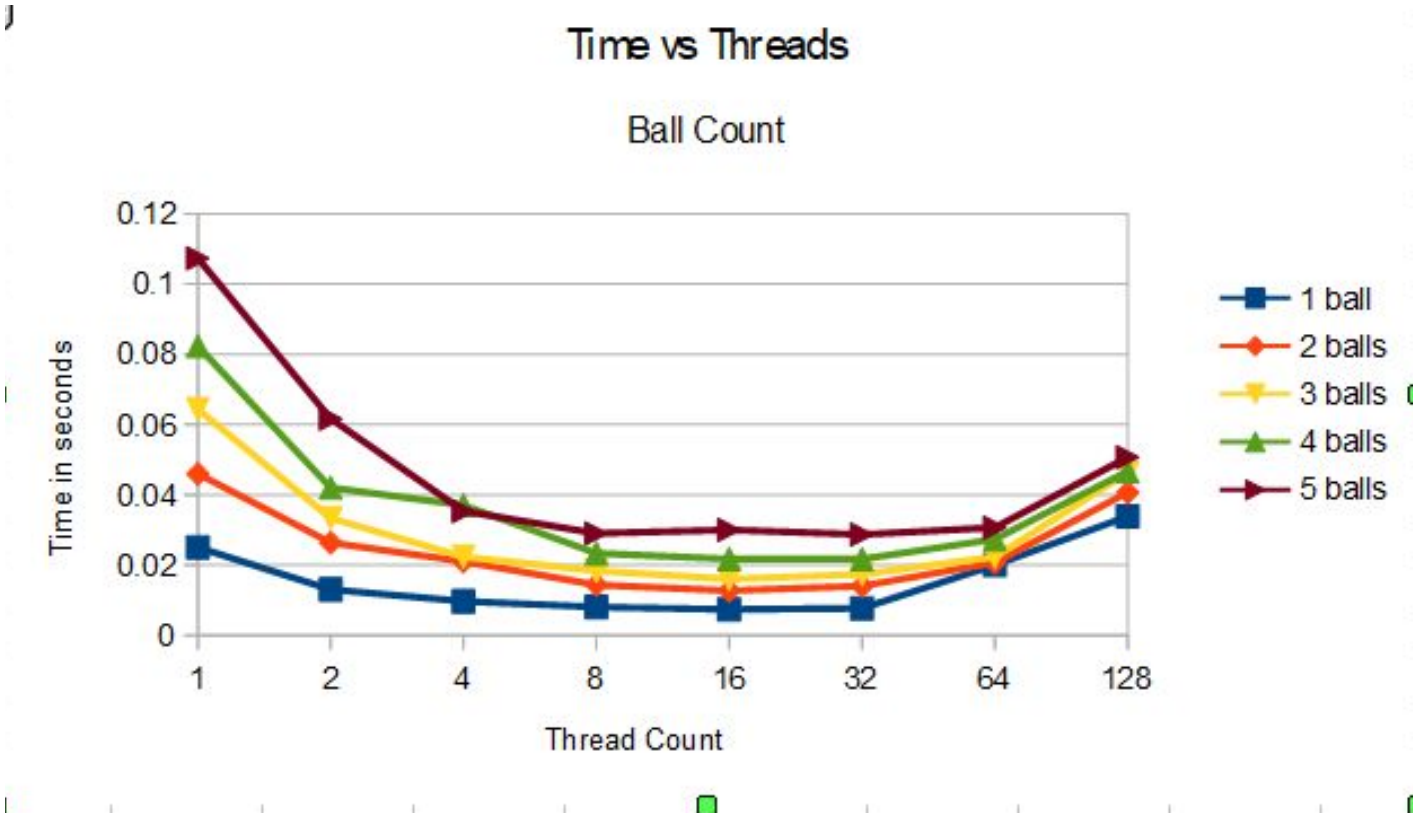

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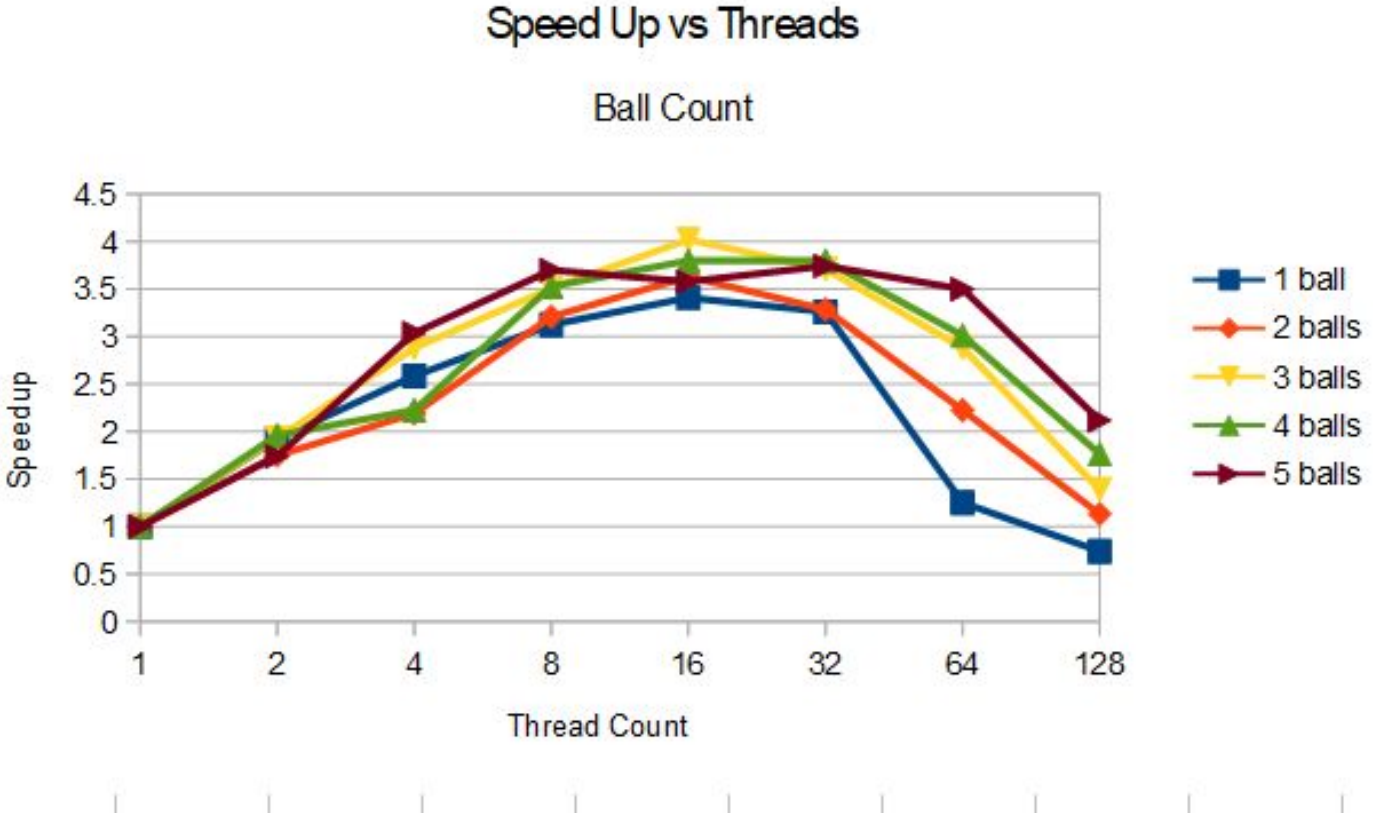

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