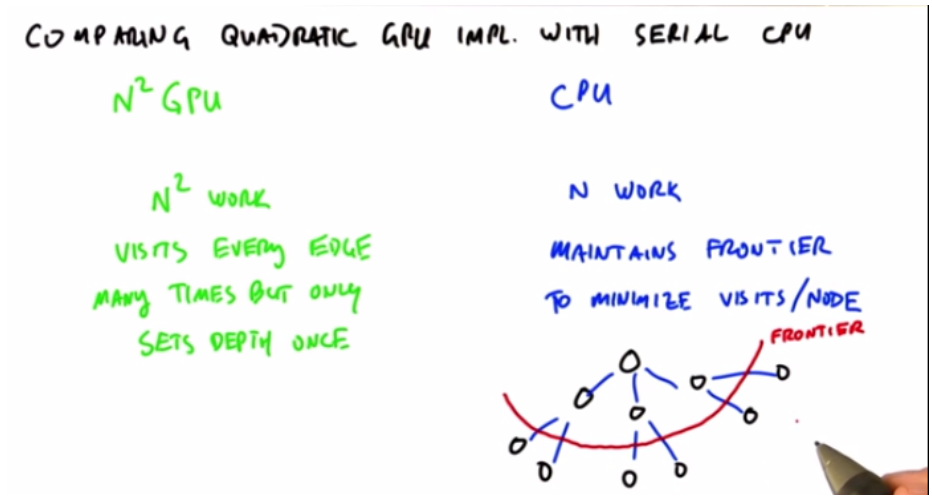
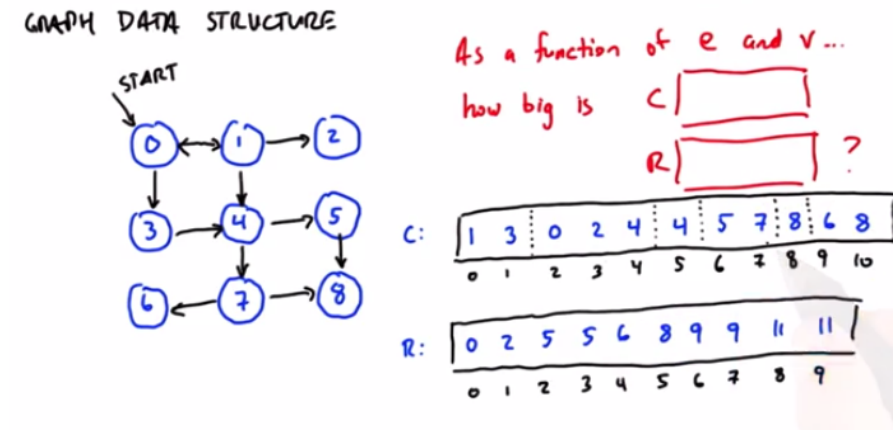
CS344 Introduction to Parallel Programming

Lesson 6.2: Parallel Computing Pattern Part B

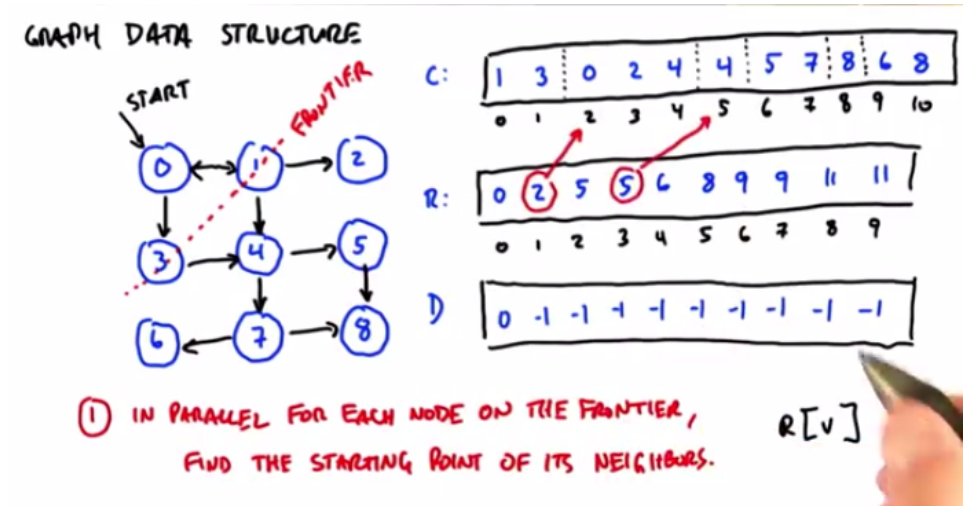
L6.2-6.1-Quadratic GPU vs Serial CPU Implementation



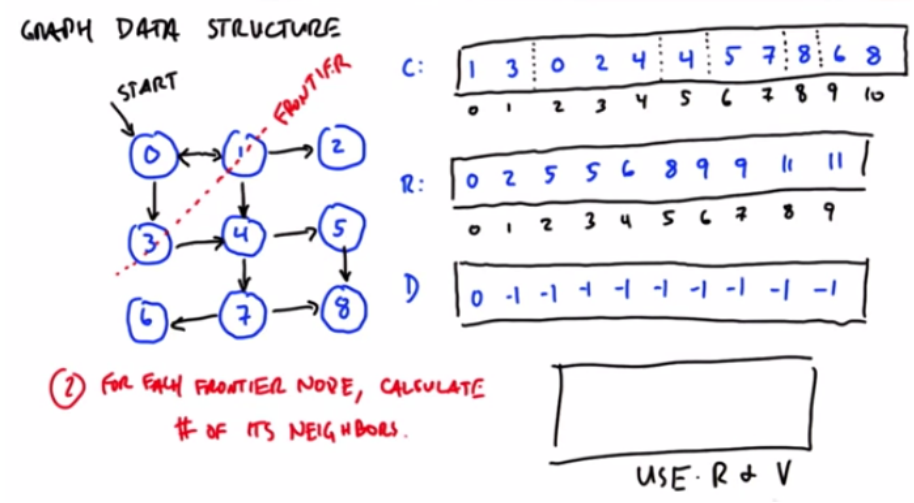
L6.2-6.2-How to Represent Graph Data Structure



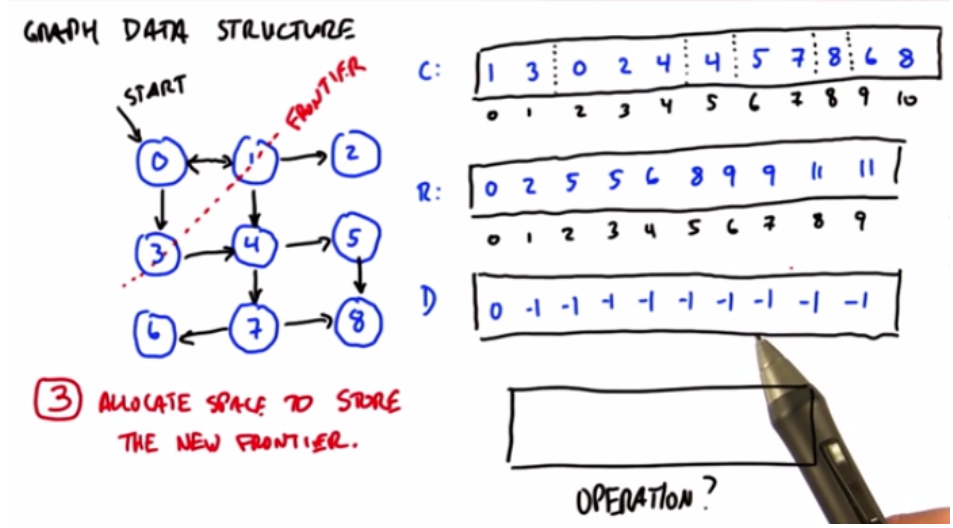
L6.2-6.3-How Does This Algorithm Work Part 1



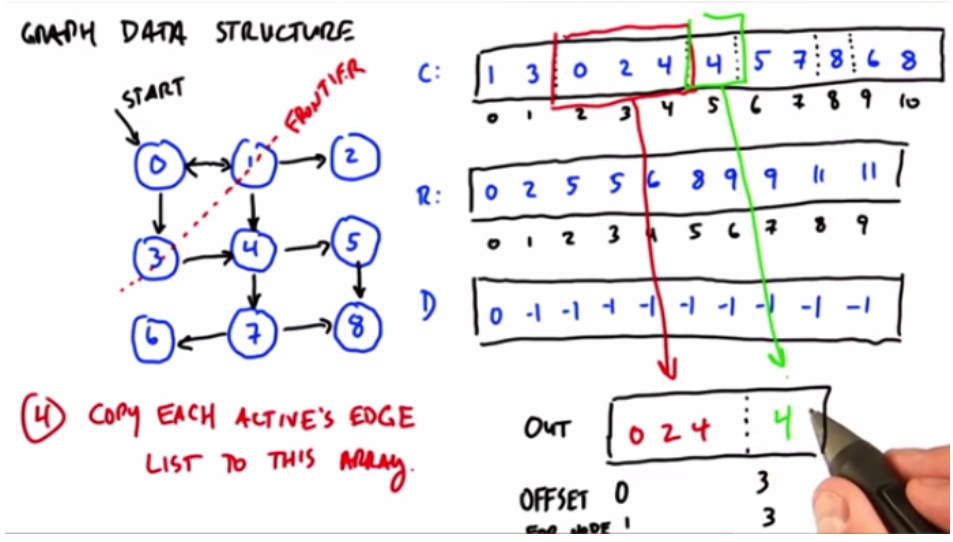
L6.2-6.4-How Does This Algorithm Work Part 2



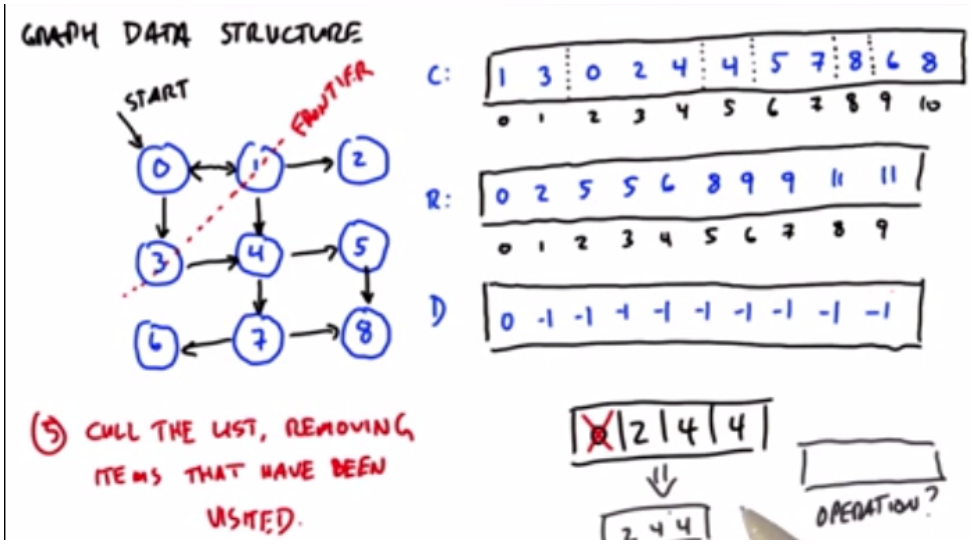
L6.2-6.5-How Does This Algorithm Work Part 3



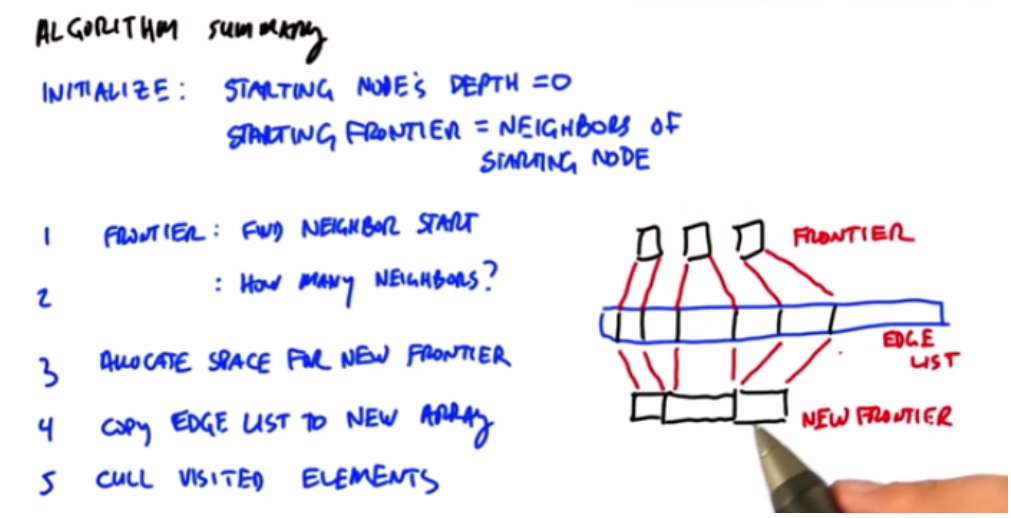
L6.2-6.6-How Does This Algorithm Work Part 4



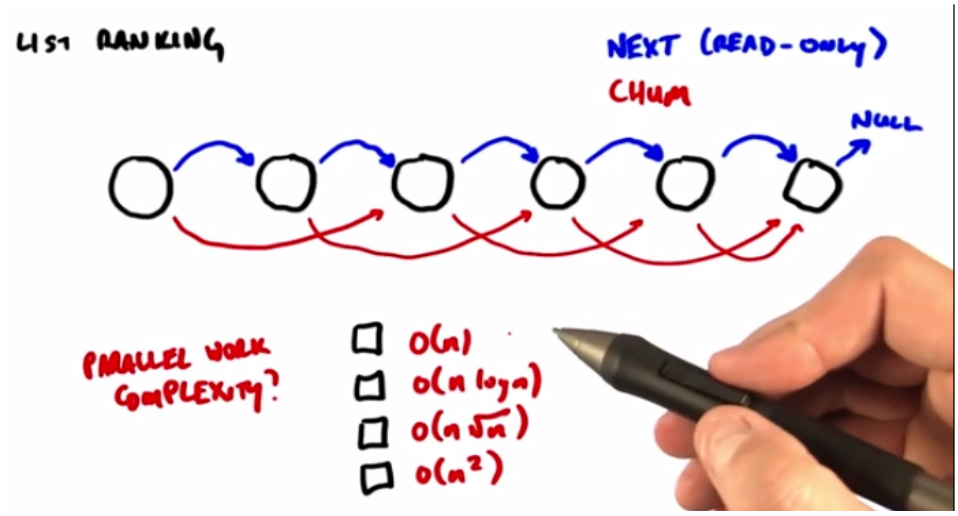
L6.2-6.7-How Does This Algorithm Work Part 5



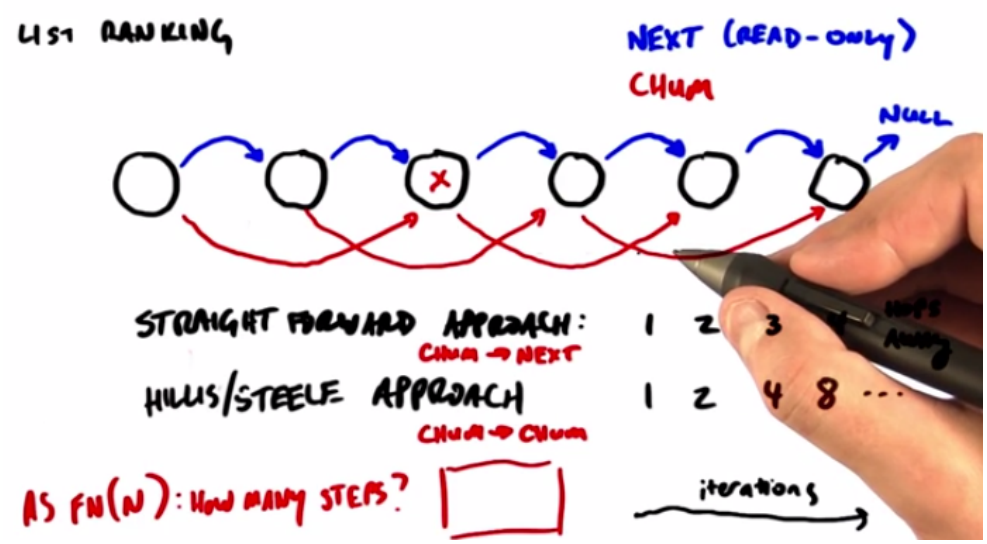
L6.2-6.8-Recap of the Algorithm



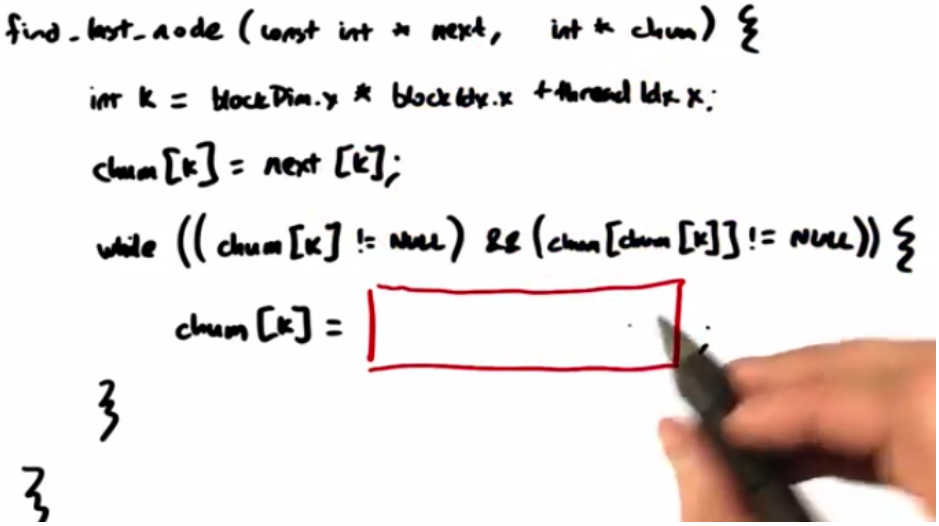
L6.2-6.9-Merrills Linear-Complexity BFS on GPUs Part 1



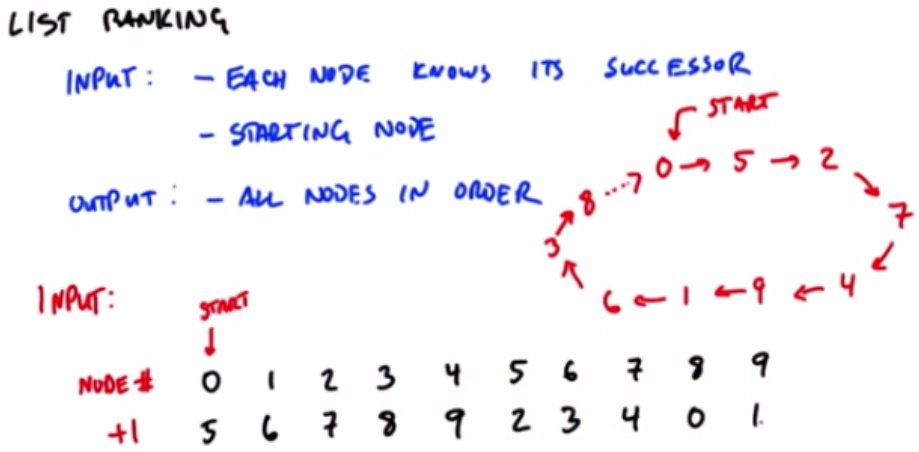
L6.2-6.10-Merrills Linear-Complexity BFS on GPUs Part 2



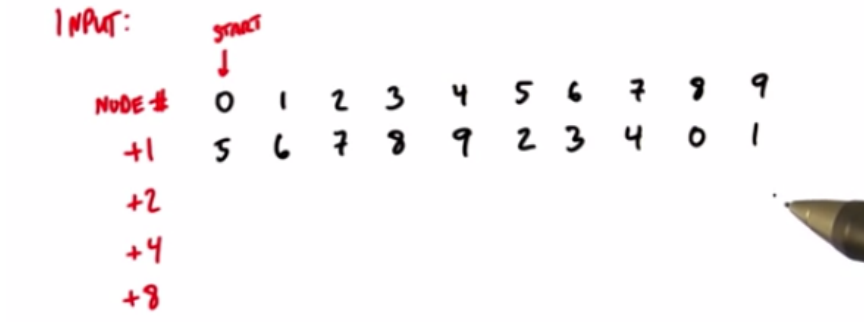
L6.2-6.11-Merrills Linear-Complexity BFS on GPUs Part 3



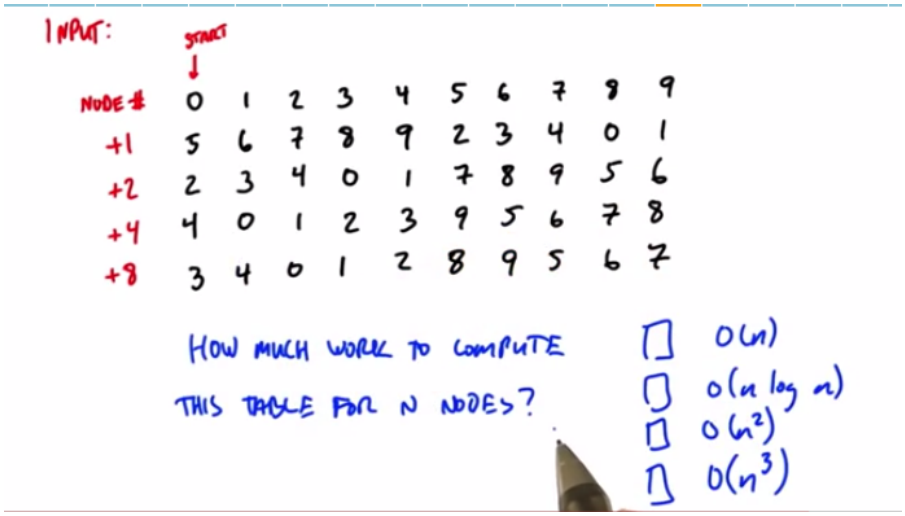
L6.2-6.12-List Ranking Part 1



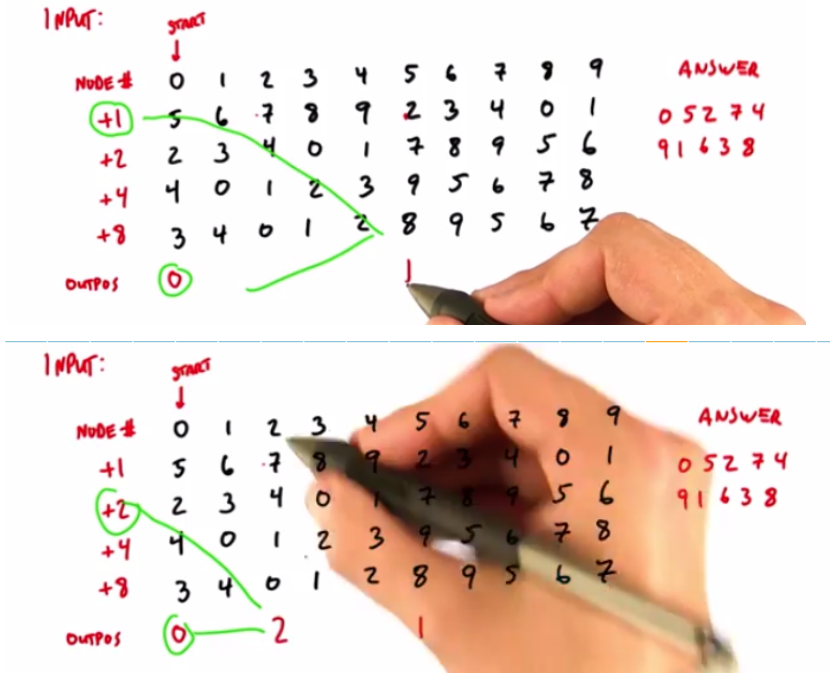
L6.2-6.13-List Ranking Part 2



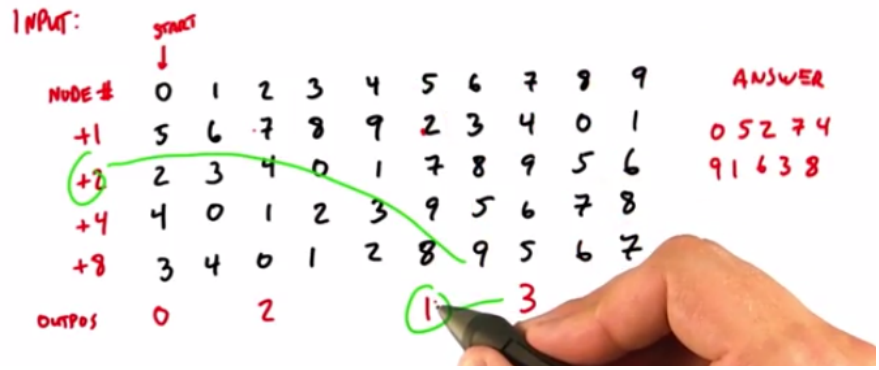
L6.2-6.14-List Ranking Part 3
L6.2-6.15-List Ranking Part 4

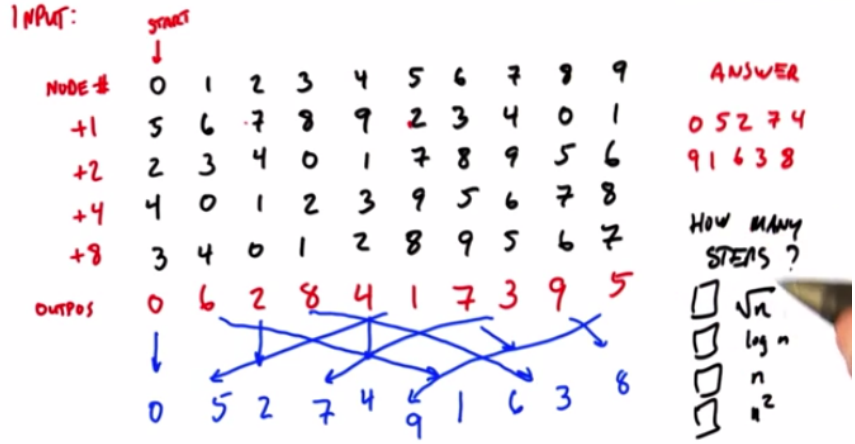


L6.2-6.16-List Ranking Part 5

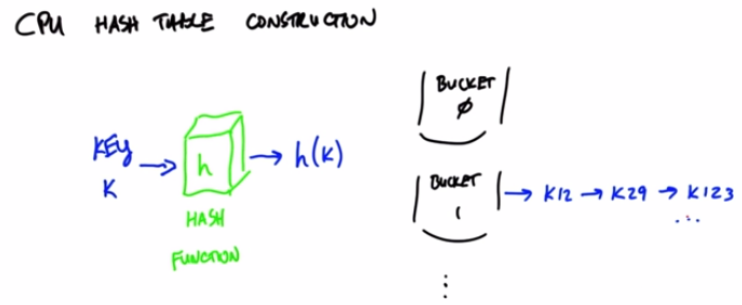


[CS344 Intro to Parallel Programming, Lesson 6.2]

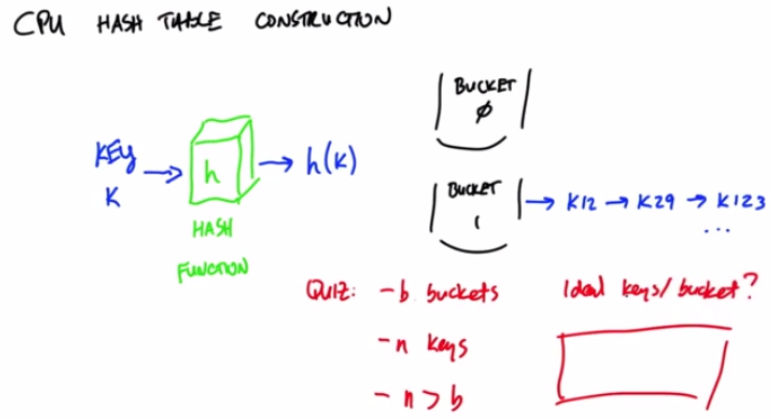




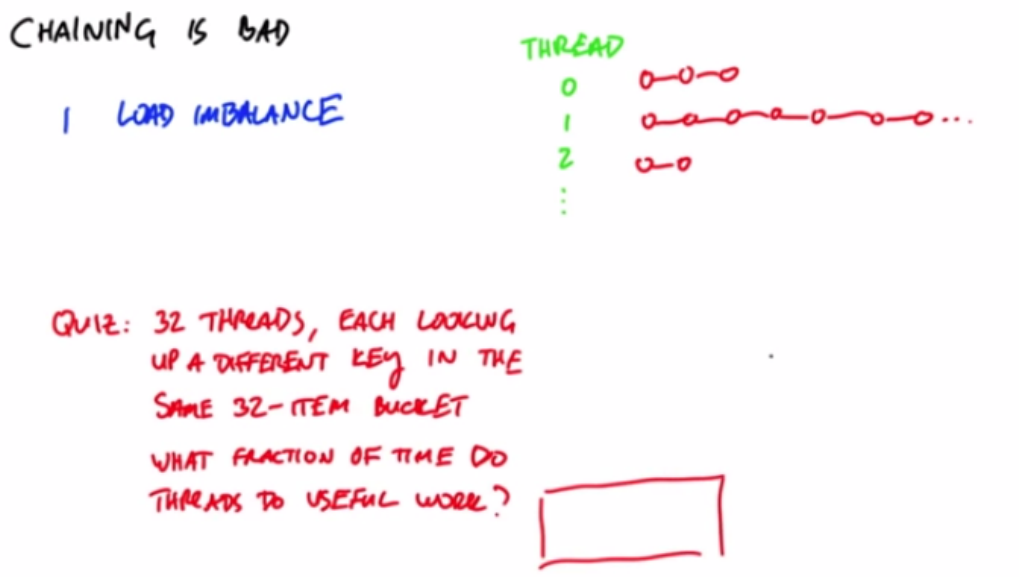
L6.2-6.17-Hash Table on CPUs



L6.2-6.18-Ideal Keys Per Bucket

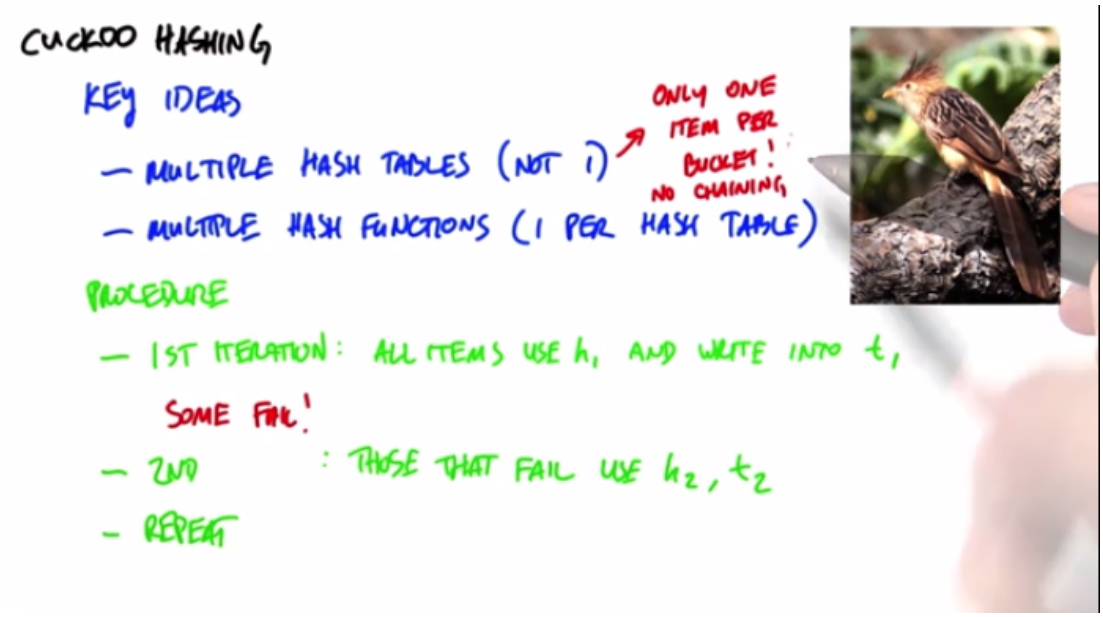


L6.2-6.19-Chaining Is Bad
L6.2-6.20-Why Chaining is Bad

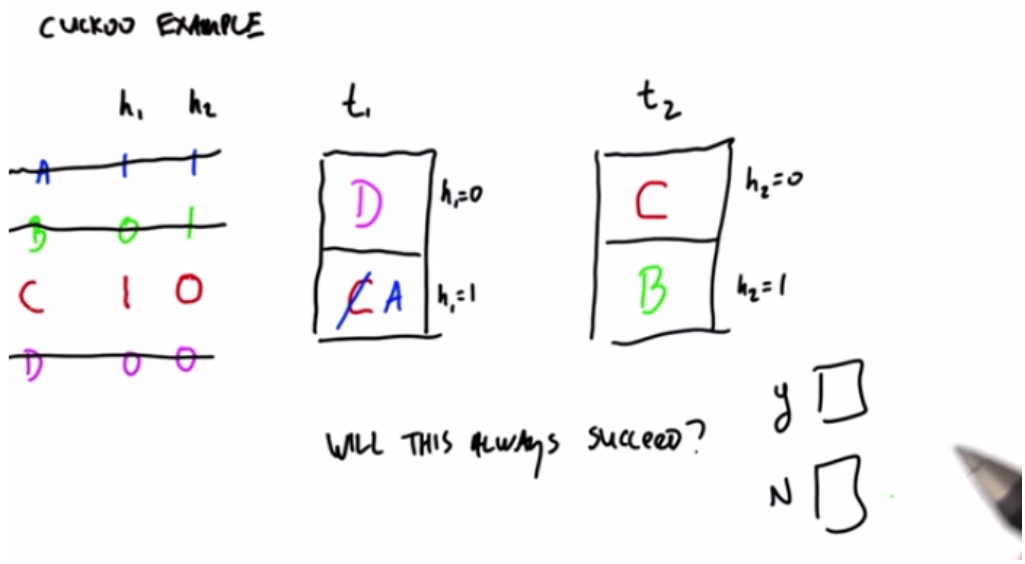


L6.2-6.21-Chaining Is Bad for Hash Table Construction

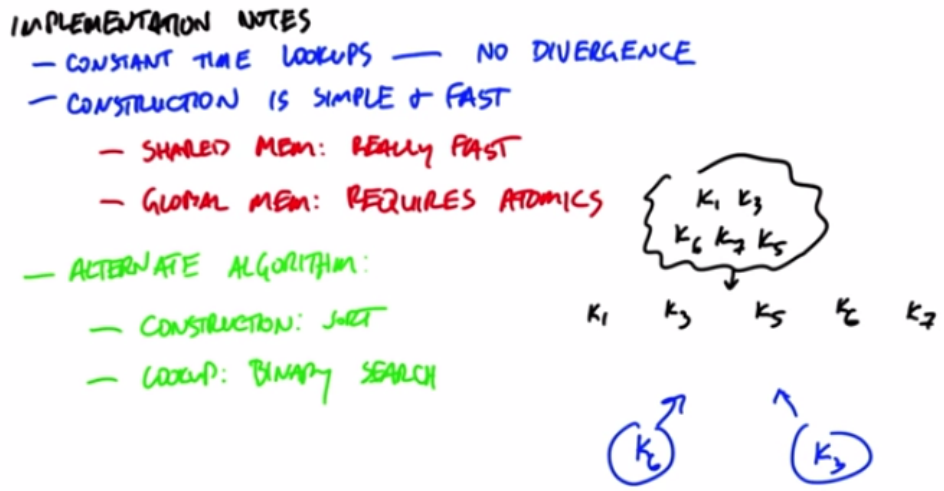
L6.2-6.22-Cuckoo Hasing Part 1



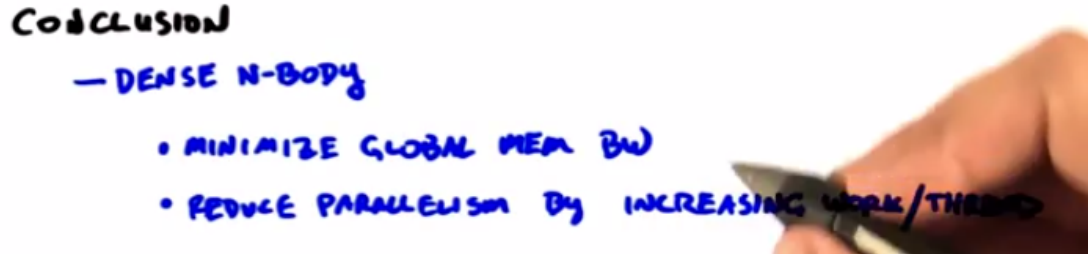
L6.2-6.23-Cuckoo Hasing Part 2



L6.2-6.24-Cuckoo Hasing Part 3



L6.2-6.25-Conclusion



Conclusion

- Dense N-Body
- Sparse Matrix X Vector
  - Data structure
  - Reduce load imbalance
  - Keep GPU busy

Conclusion

- Dense N-Body
- Sparse Matrix X Vector
- BFS
  - Choose efficient algorithms
  - Irregular expansion / contraction : scan

Conclusion

- Dense N-Body
- Sparse Matrix X Vector
- BFS
- List ranking
  - Trade more work for fewer steps
  - Power of scan

Conclusion

- Dense N-Body
- Sparse Matrix X Vector
- BFS
- List ranking
- Hash table
  - Parallel-friendly data structure