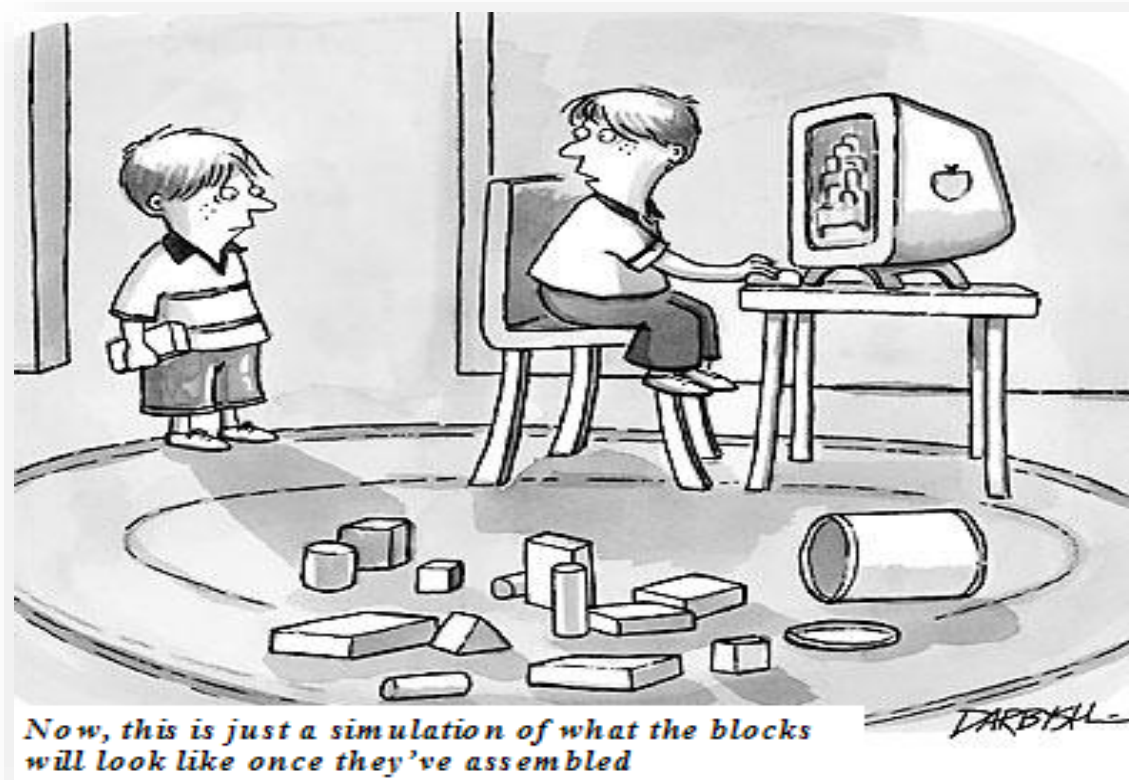


# ECE569

## Module 39

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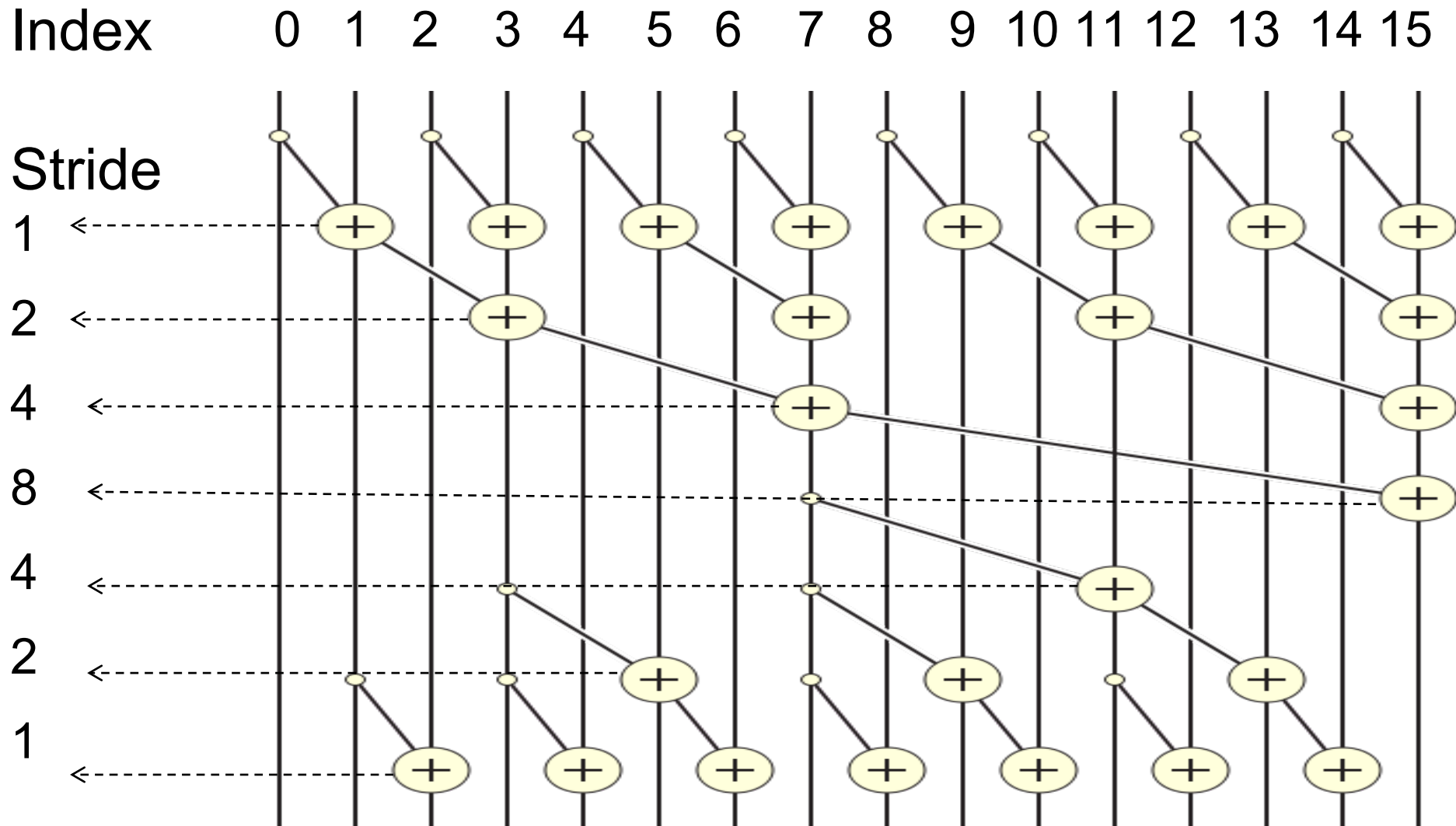
- Scan – Version 3 and Analysis

## Version-3 (Reduction and Construction Phases)

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0	1	2	3	4	5	6	7	index
3	1	7	0	4	1	6	3	

# 16 element scan flow, 8 threads/block, +: thread



# Analysis

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- **Running Sum of N elements**

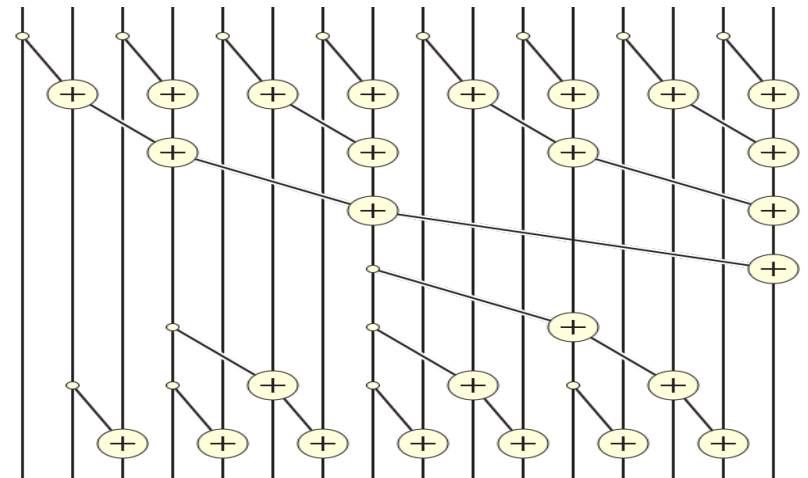
- How many steps? Amount of work? In terms of N
- Two phases: Reduce and Construct

Steps

Work

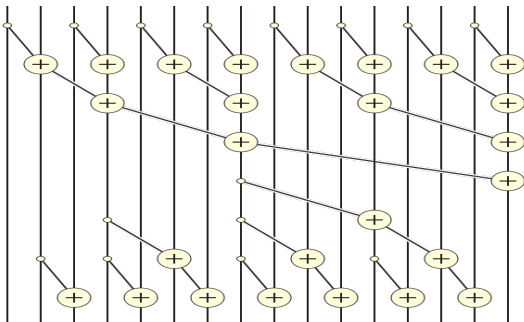
Reduce

Construct

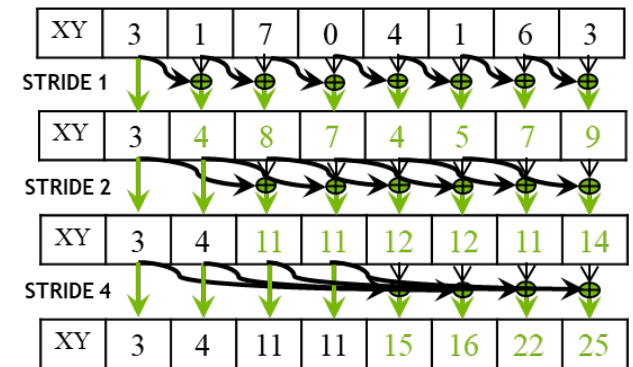


# Evaluation

	Step Complexity	Work Complexity
Version 1 (Naïve)	<b>N</b>	<b><math>O(N^2)</math></b>
Version 2	<b><math>\log N</math></b>	<b><math>N \log N</math></b>
Version 3	<b><math>2 \log N</math></b>	<b><math>O(N)</math></b>



**Step count doubled with less work!**



One has better step efficiency the other has beater work efficiency.

# Next

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- Implement Version 3
  - Reduction
  - Construction