

Writing a Program

Software Engineering

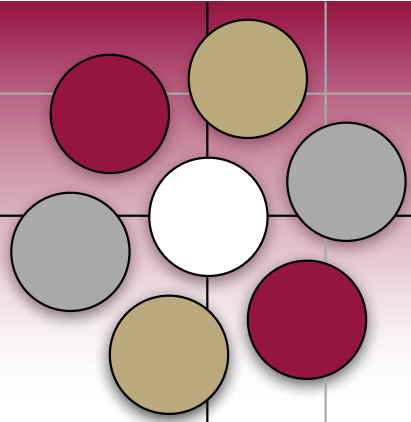
CS 130

Donald J. Patterson

Content adapted from Essentials of Software Engineering 3rd edition by Tsui, Karam, Bernal Jones and Bartlett Learning

My Family

- I'm married and have four kids and live on the East Side
- I'm pretty open about my story

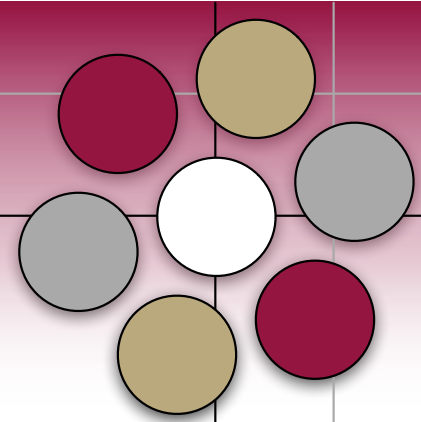


My Background

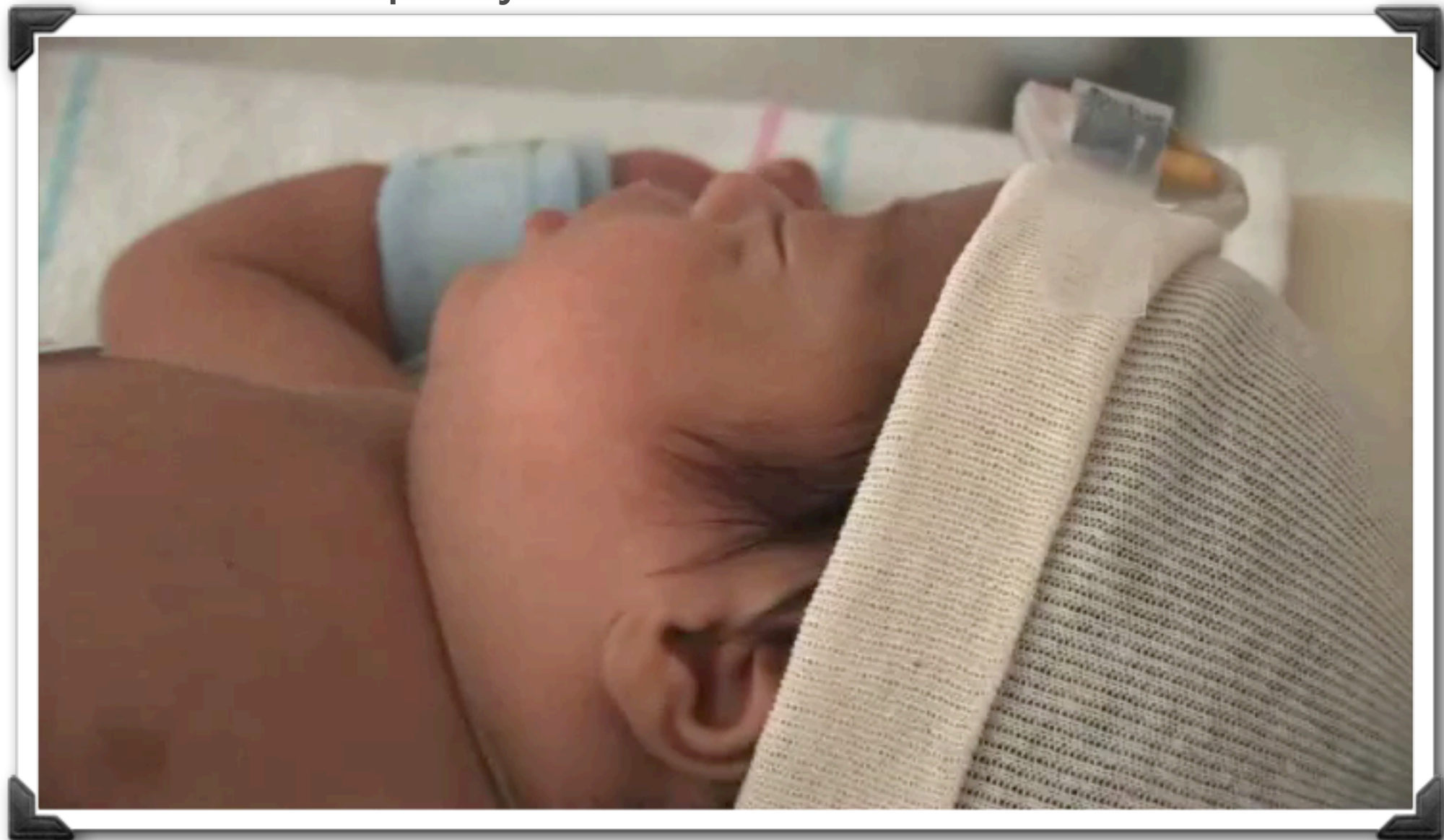
- B.S., Computer Science from Cornell (NY)
- M.Eng, Electrical Engineering
- STRIKE Officer
 - USS CURTIS WILBUR, DDG-54, Japan
- Operations Officer
 - USS SIMON LAKE, AS-33, Italy
- Ph.D in Computer Science and Engineering at UW
- Director of the Laboratory for Ubiquitous Computing and Interaction
- Co-founder of quub, whisper.fm, swayr, waitscout, audia



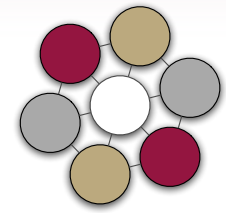
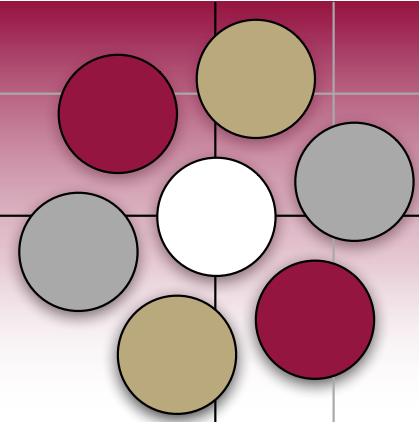
My Research



- Artificial Intelligence + Collapse Informatics + Ubiquitous Computing
- Example: I made a sensor system for babies in the NICU to detect cerebral palsy

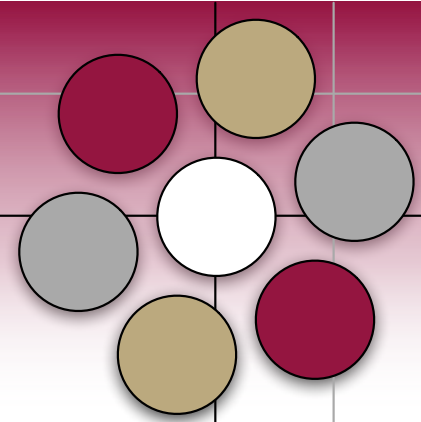


Overview



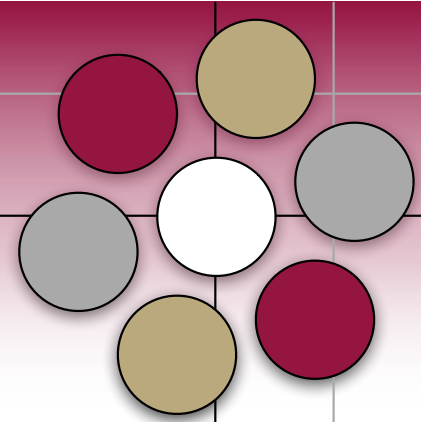
Introduction

- Interaction Design
- Decisions
- Requirements
- Design Constraints
- Design Decisions
- Testing
- Implementation



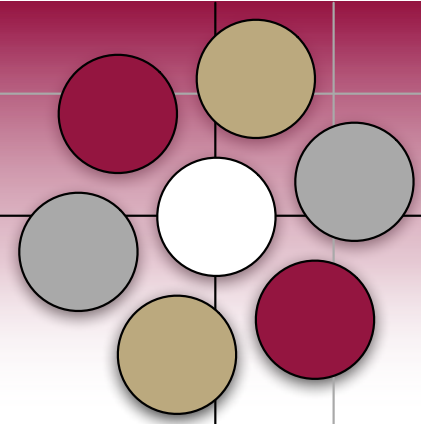
Writing a program

- Creating software is a team effort
- Teams require governance
 - Leadership
 - Processes
 - Standards
- Institutional Artifacts that transcend an individual



Team sizes

- Individuals
 - Personal projects, school projects, learning
- Pizza sized teams
- Federated teams
 - Boeing
 - Microsoft
 - Google



Software Teams

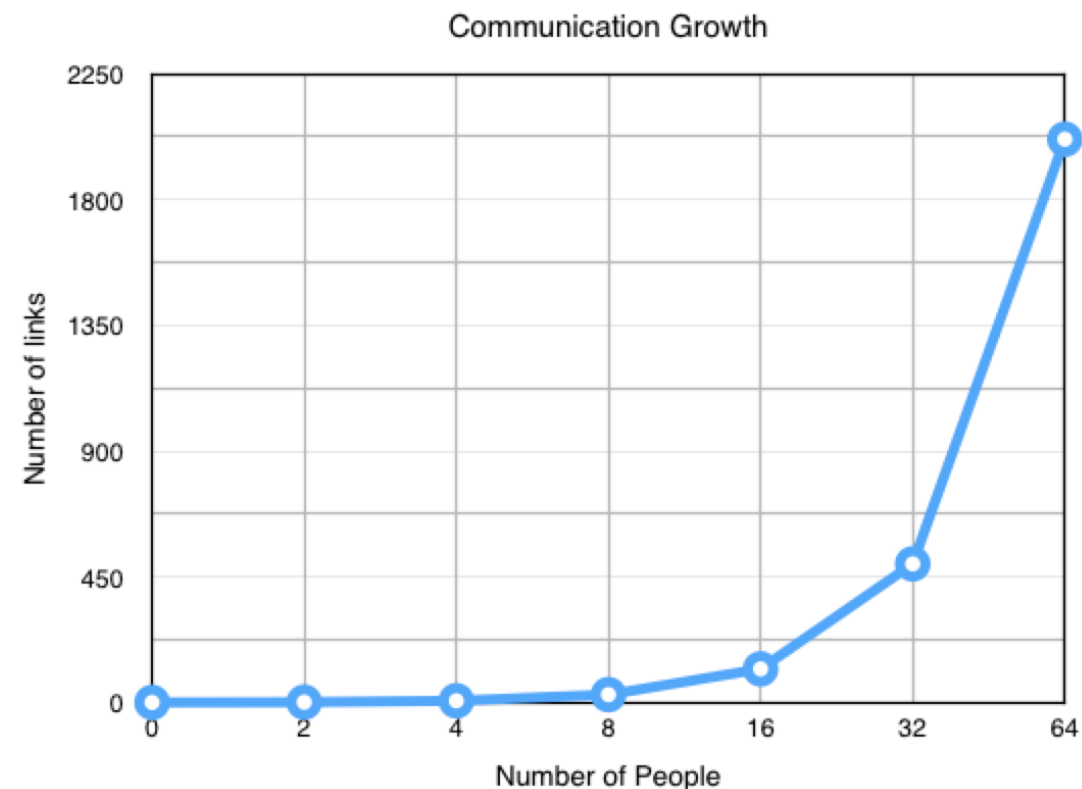
- Software requires understanding abstract arrangements of information

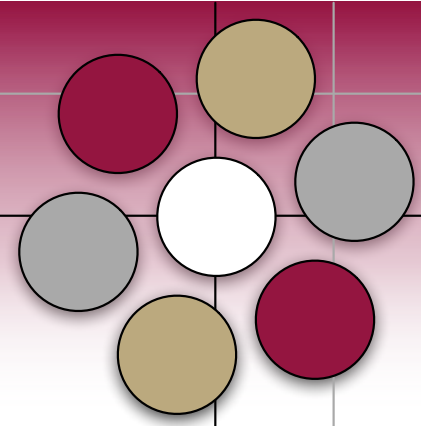
- This requires communication - lots of it
- As teams grow the interconnections grow

$$\frac{(n)(n - 1)}{2}$$

Table 1

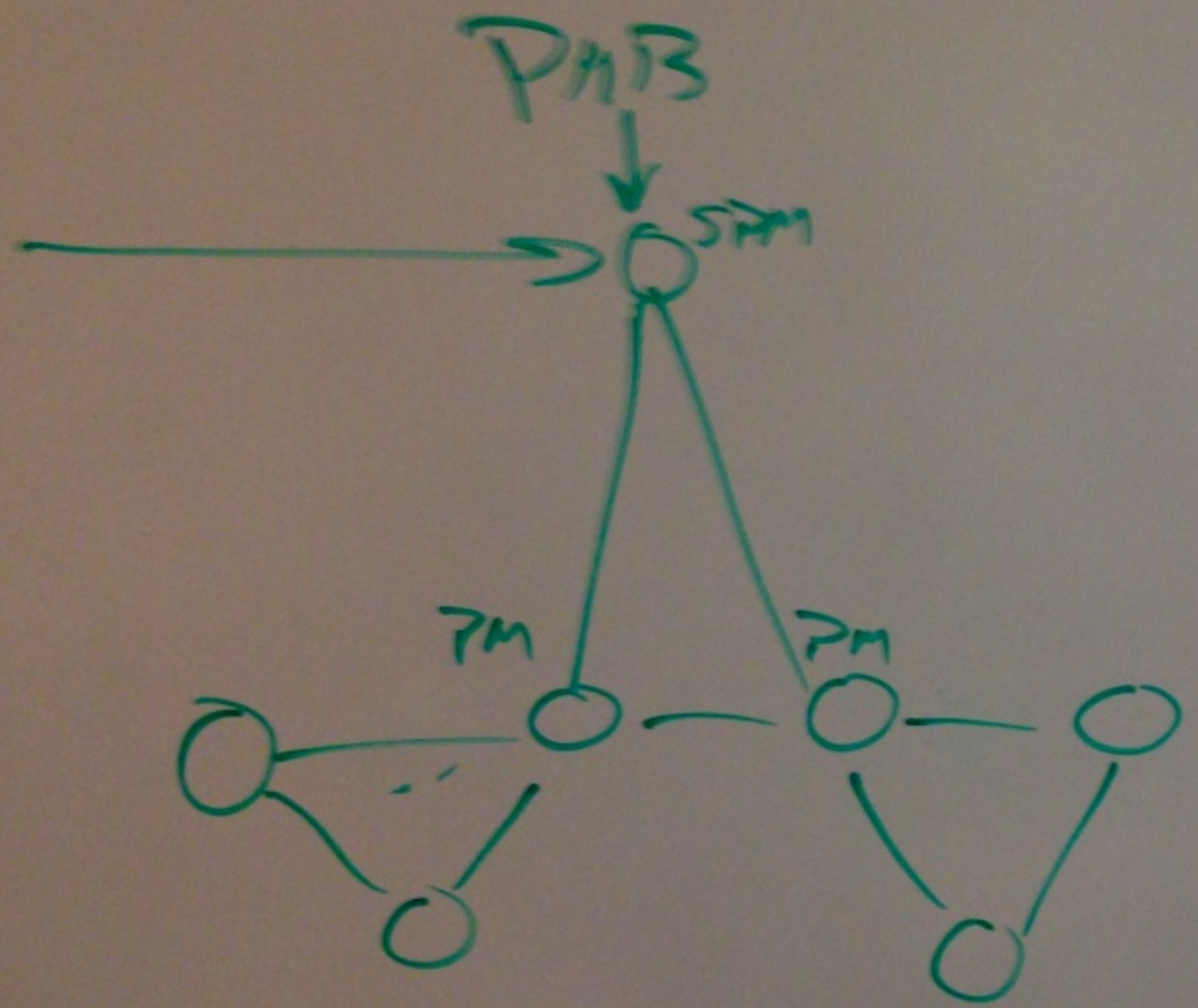
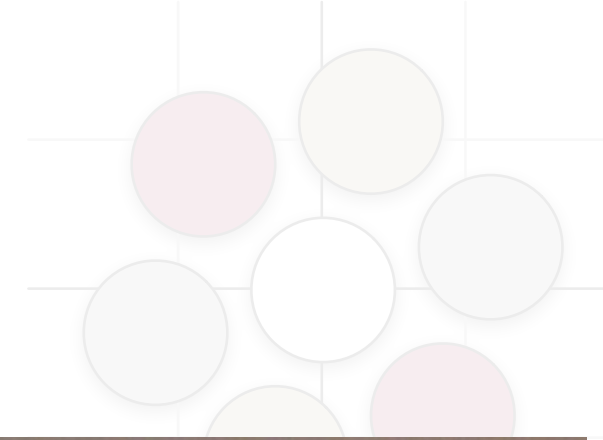
# of people	# of links
0	0
2	1
4	6
8	28
16	120
32	496
64	2016



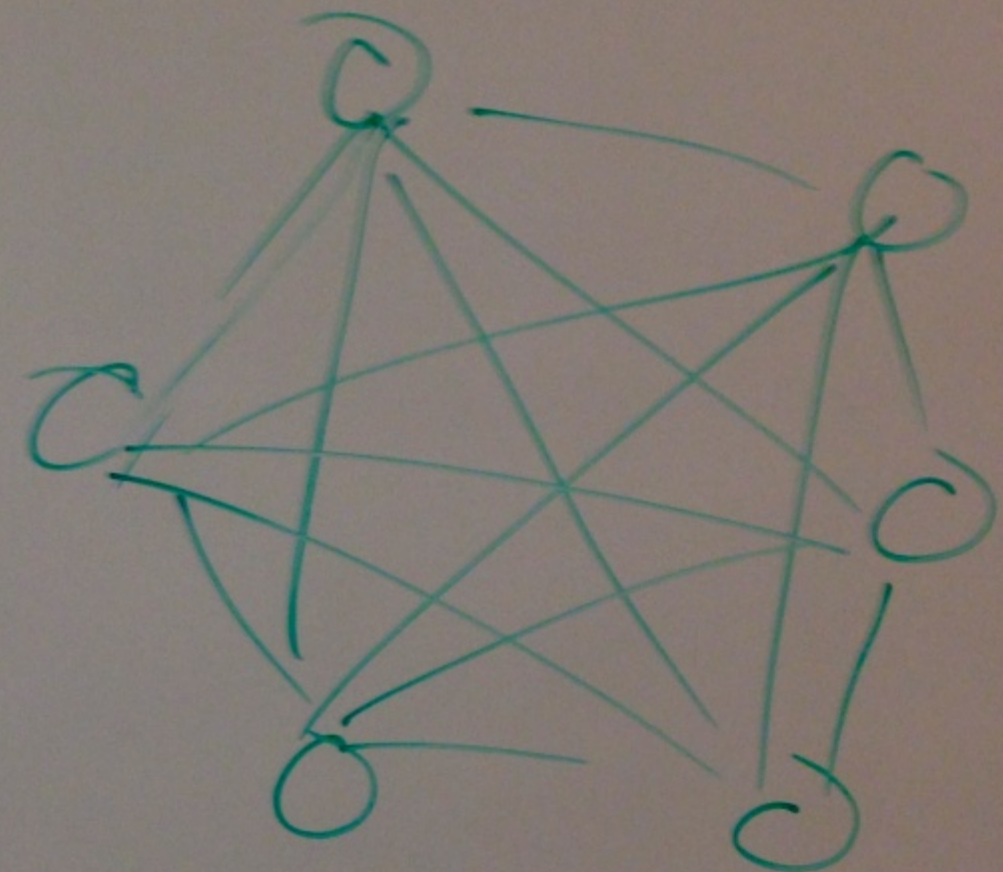


Software Teams

- Pizza-sized teams limit communication links
- Larger teams require hierarchy to manage complexity
 - This can slow down architecture
 - Architecture becomes influenced by communication structure

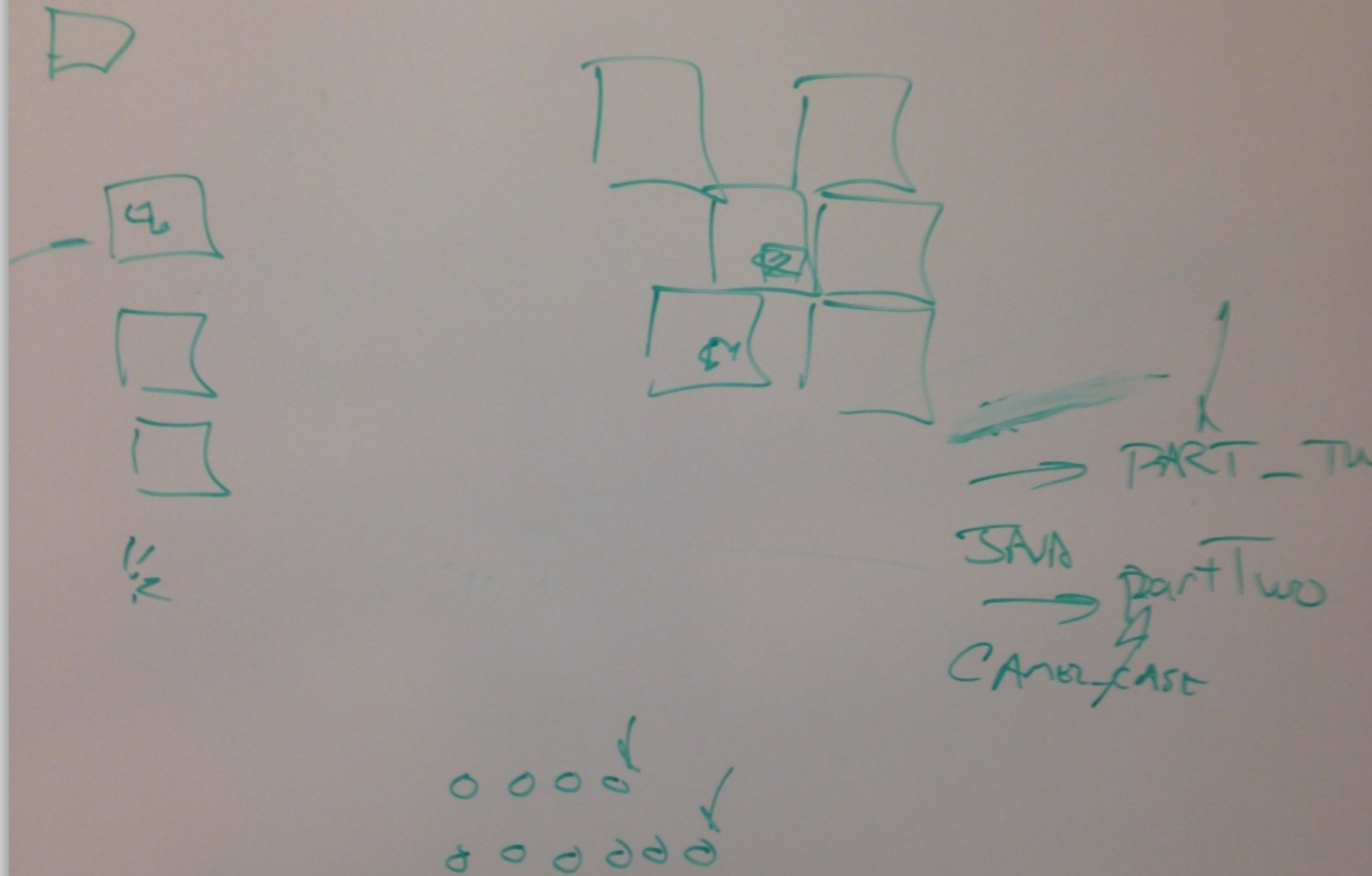


7 nodes hierarchical

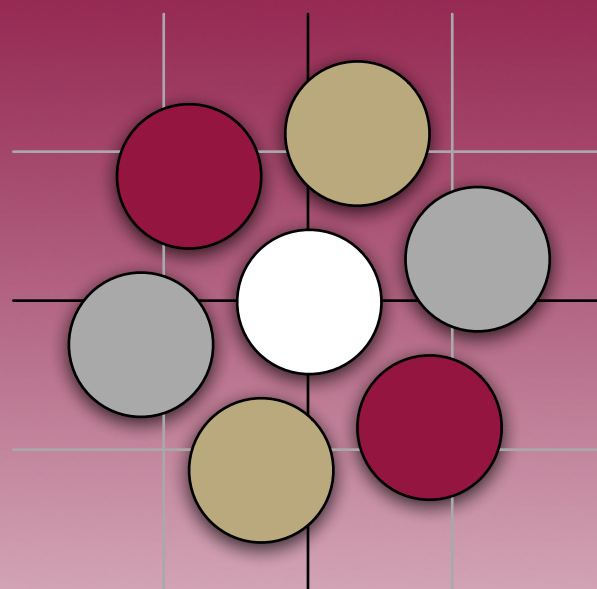


6 nodes

10,000 OVER IOWA



Class Project Intro



WESTMONT COMPUTER SCIENCE