A Model for the Community

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Why Model?

If people do not believe that mathematics is simple, it is only because they do not realize how complicated life is.

- John von Neumann

Modeling – that is, math modeling

Picture credit: http://misc.thefullwiki.org/Calvin_Klein

Call for Projects

- Aided by Community Service office after I supplied examples
- Office supplied 5 of 6 projects

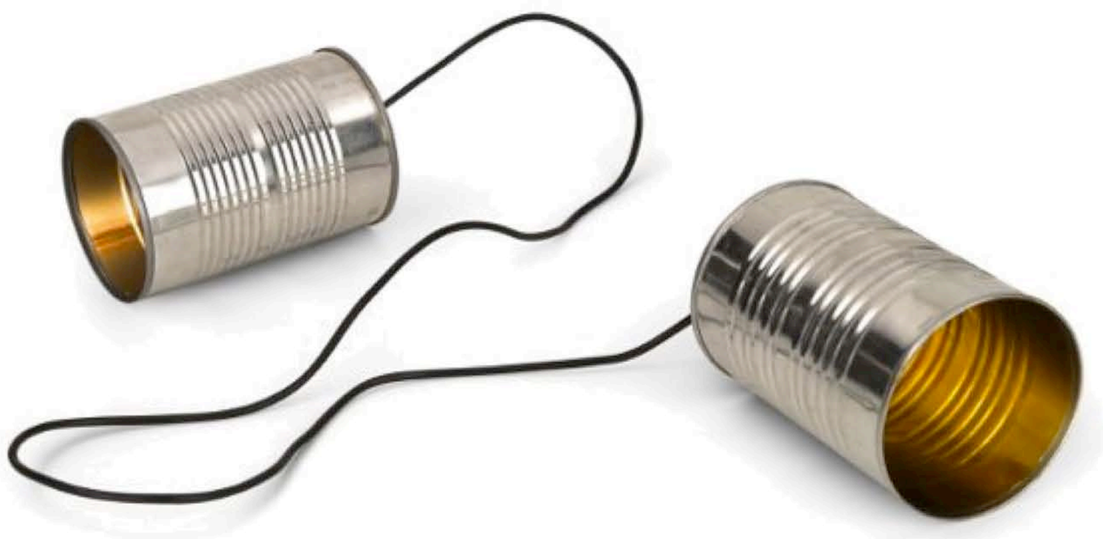
- This year, I supplied 4 of 6
- I vetted topics
- Started in fall

Picture credit: http://www.schley.net/jim/?p=1093

Communication

After selecting the projects, I communicated the community partners regarding:

- follow up questions
- schedule (meeting weeks and poster session)
- to define clear expectations regarding work

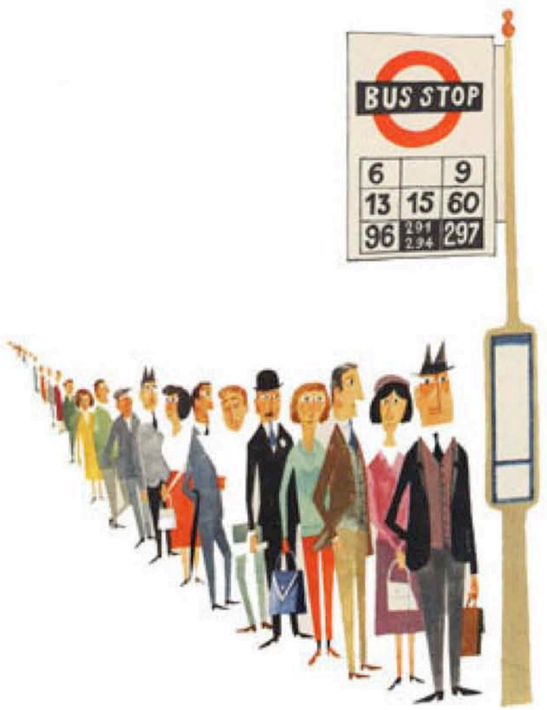


Picture credit: http://www.encorekb.com/

Modeling Toolkit

Discrete math modeling teaches topics including:

- Monte Carlo simulation – queues
- Markov Chains – Google's PageRank
- Linear/Integer Programming – Sudoku



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Thanks to Laura Taalman

Picture credits: http://www.michellehenry.fr/transport.htm and
http://www.vincegolangco.com/motivational/pagerank-explained-what-is-pr

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Experienced model

Early in the term, class participates in MCM

- Work in a group
- Tackle an open ended question

Picture credit: http://www.sonnyradio.com/teamwork.html

Selecting an A Team

- Teams assigned such that each group has
  - a programmer and
  - a writer
- Mathematical diversity is desired, as possible

Picture credit: http://www.tvsquad.com/

Schedule

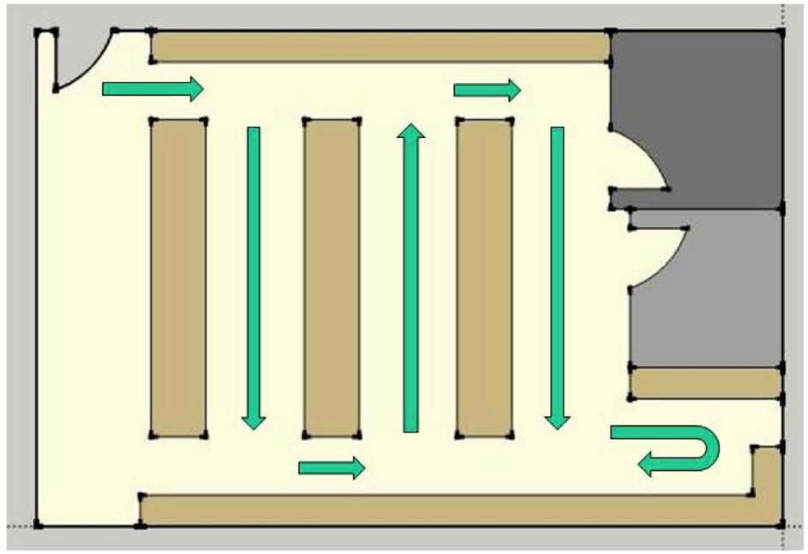
- Week 9 – Topics presented and assigned
- Week 10 – Proposal due
- Week 11 & 13 – Project meetings
- Week 14 – Poster session
- Week 15 – Paper due

Picture credit: http://www.ag.ohio-state.edu/~intranet/story-print.php?date=2007-05-30&newsletter=6&PHPSESSID=1e136bc0f4207cd080757736bdfbbb04

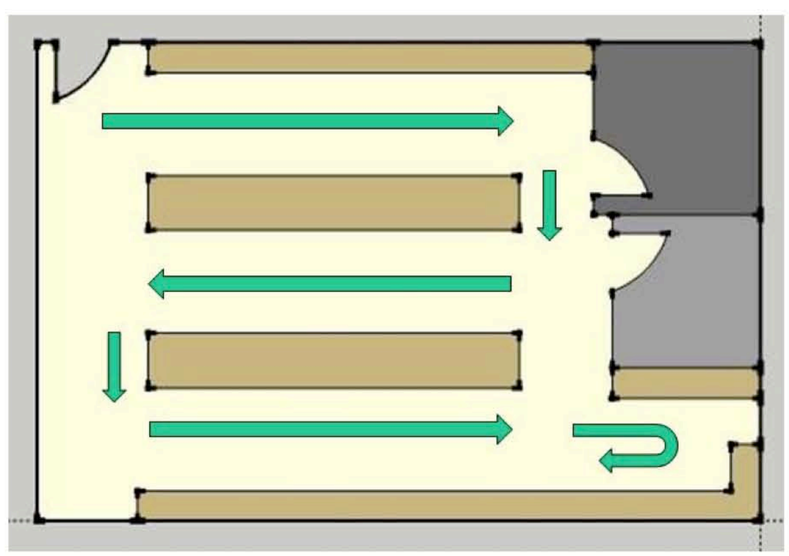
Design

Project: Design layout for the food pantry's new location that will include walk in refrigeration units, shelves and storage.

Ada Jenkins CENTER
Opening the Doors to Opportunity



Vertical layout with passing
1430 ft^3 of shelving space
Serves 308 families of average size
Average of 54 min. to serve 30 families



Horizontal layout with passing
1320 ft^3 of shelving space
Serves 286 families of average size
Average of 53 min. to serve 30 families

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Design

Project: Design layout for the food pantry's new location that will include walk in refrigeration units, shelves and storage.

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With a few tweaks to student work, the pantry "managed to get approximately 40% more space in the new pantry and it is now possible for carts to pass in the aisles."

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Layout

Project: Improve space usage/layout of the waiting area including incorporating two offices, receptionist space and phone receptionist space.

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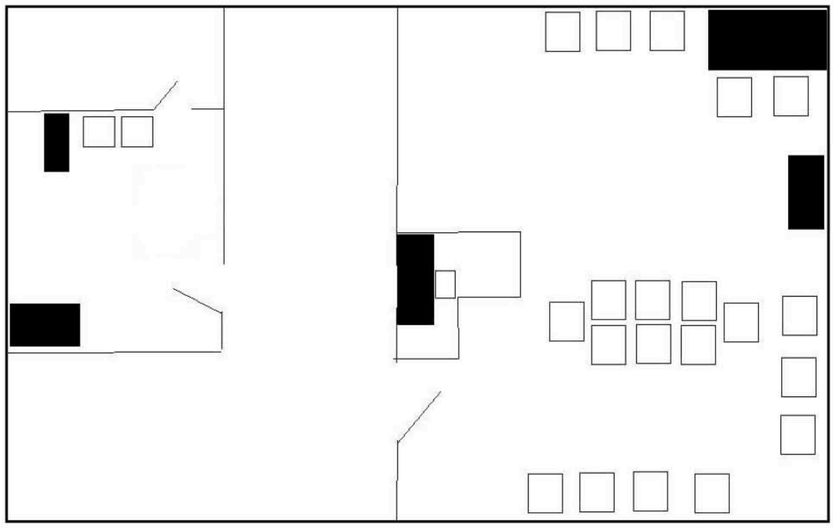

Fig.1 *The original setup complete with receptionist, computers, vending machine, and the original chair layout.*

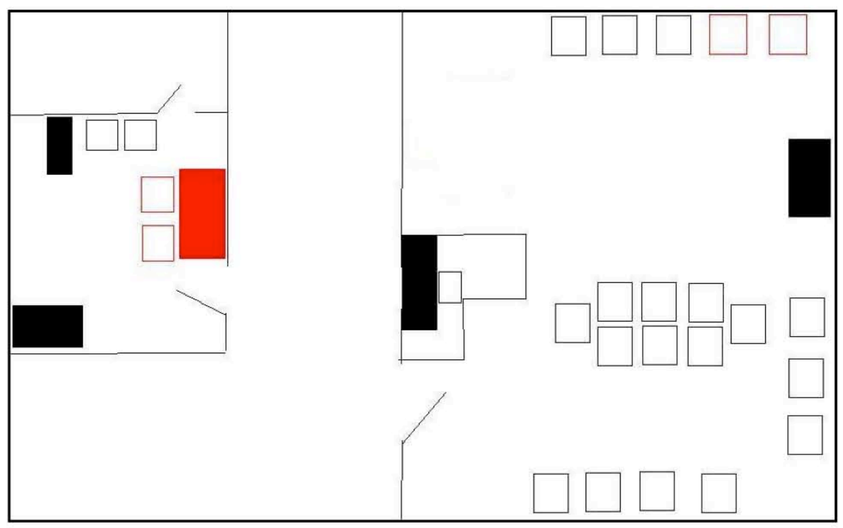

Fig. 2 *In this layout, we moved the computers across the hall and added two extra chairs to the main room.*

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Layout

Project: Improve space usage/layout of the waiting area including incorporating two offices, receptionist space and phone receptionist space.

Ada Jenkins CENTER
Opening the Doors to Opportunity

"...has optimized the space utilization! So, success!"

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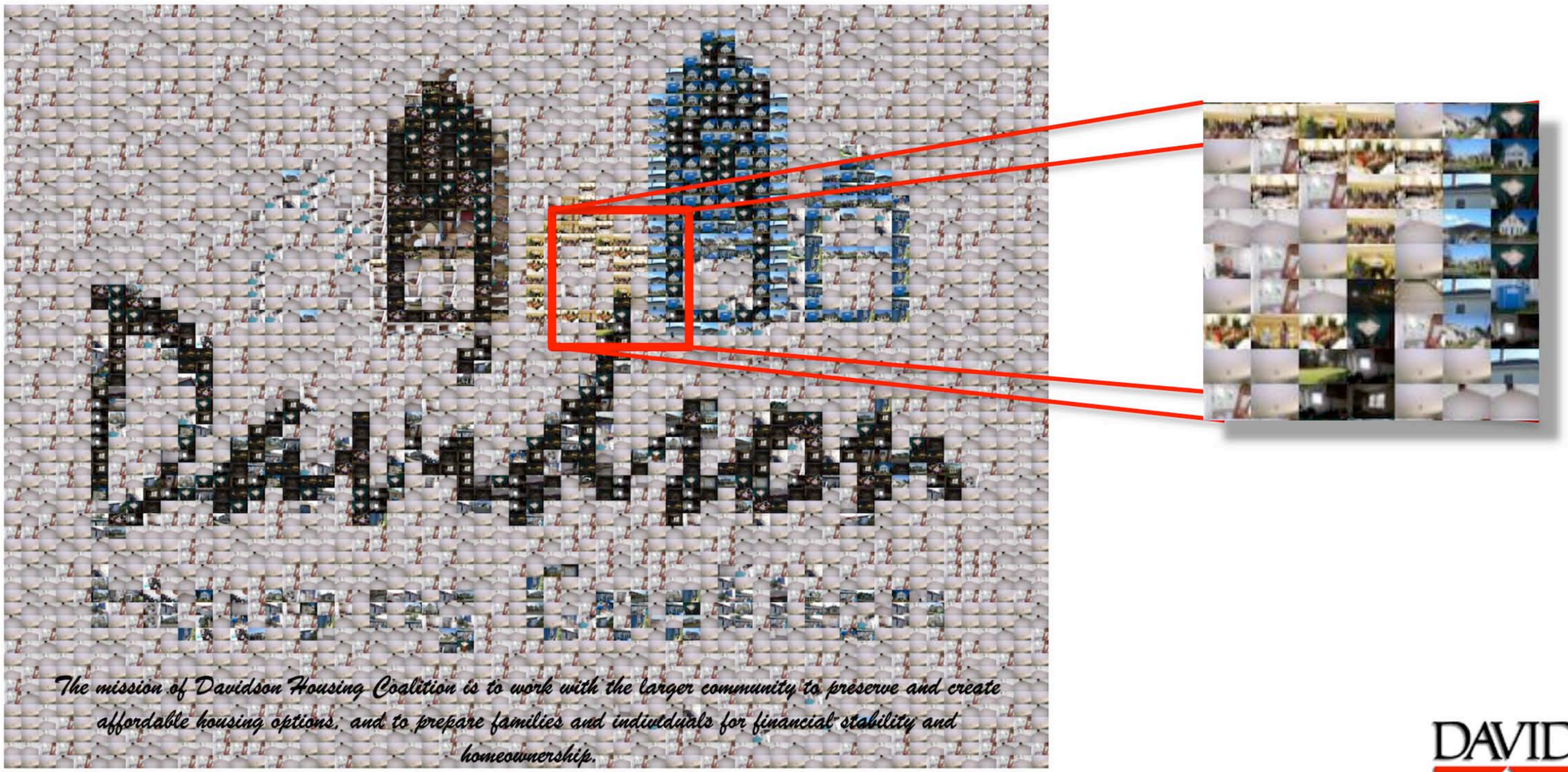
Office art

Project: Create a photomosaic of a logo using pictures from the organization's work.

Davidson Housing Coalition
Opening Doors.



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Office art

Project: Create a photomosaic of a logo using pictures from the organization's work.

Davidson Housing Coalition
Opening Doors.

The photomosaic "hangs at the front, main entrance of the office….Newcomers…regularly comment on the unusual piece. The artwork relates how affordable housing can and does fit into a healthy, diverse community."

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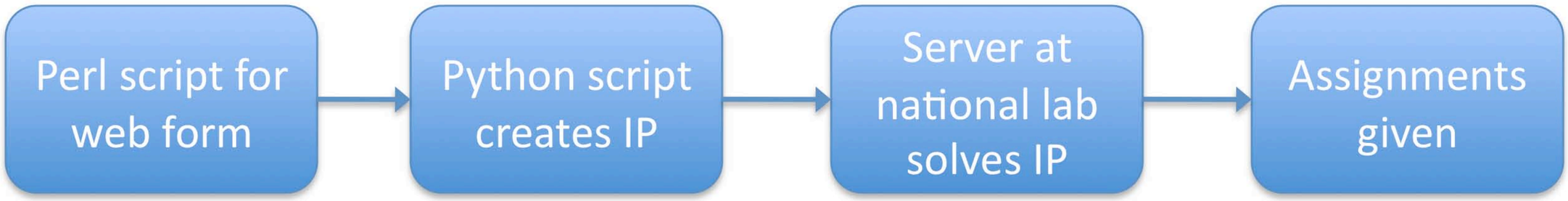
Assignment

Project: Assign students into practicum groups from data containing each student's top three choices.



Assignment

Project: Assign students into practicum groups from data containing each student's top three choices.

COMMUNITY SCHOOL OF DAVIDSON

After initial excitement about the project's impact, the school made changes to the program that did not enable them to use the students' work. The revisions have made a new project possible for this year.

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Poster session

- During the class hour
- Community partners attended

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Paper

- Due one week after poster
- 2 page executive summary
- 8 – 10 pages, 20 pages max

Picture credit: http://www.flickr.com/photos/critter_lm/199190303/

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Feedback

- *"I thought the MCM and final project were awesome. Not only did I learn a great deal about how to write a math modeling paper but I also grew very close to my teammates. By the end of the term, I felt like the class was a family."*
- *"Best class I have had at Davidson; very interesting, good blend of concepts vs. real life application, challenging but fair, and a community project where we can actually see the results of our work."*

Picture credit: http://www.suggestionbook.com/

Envision, plan, and...

Photo credit: http://strongsideacademy.com/2010/09/game-time/nike-just-do-it/