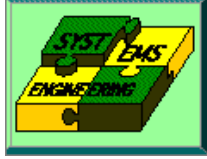
George Mason University



SYST 101: Intro to Systems

Lecture 6

Feb. 6, 2002

C. Wells, SEOR Dept.

Announcements

- INCOSE - International society of systems engineers. Publishes the journal System Engineering.
  - Student membership forms available in the SEOR Dept. office.

Announcements 2

- Lego Competitions
  - INCOSE is sponsoring a Lego robot competition. Robot competition, may be like "BattleBots." The Dean has decided that there will be a Systems Engineering GMU team present.
  - Volunteers?

Announcements 3

- Feb 20 will be a Laboratory day
  - final design and checkout of Project 1
- Mar 4 will be a review day
- Mar 6 will be the Midterm Exam

Agenda

- Objective for Today
  - Additional Project 1 Information
  - Pair Wise Comparisons
  - Utility Curves

Homework Discussion

- Completion of Mindstorm demo?
  - Everybody loaded the software?
- Anyone need extra parts?

Cost of Parts

- Excel file will be posted on course website.
- Need to download a copy and fill it in with the quantities of parts you use in your robot.
  - This will be used to determine the “cost” of your project.

Grading of Project 1

- 4 teams on Feb 24, 5 teams on Feb 26
  - Robot performance
  - Oral presentation (and questions)
  - Documentation package
  - Peer evaluations
- Relative weights are TBD
- 15 minutes for each team

Project 1 Test Schedule

Feb 25	
12:15-12:30	
12:30-12:45	
12:45-1:00	
1:00-1:15	

Feb 27	
12:00-12:15	
12:15-12:30	
12:30-12:45	
12:45-1:00	
1:00-1:15	

Robot Performance

- Accuracy of each circle diameter 25
  - (full credit if circle within 6 inches of requested size)
- Repeatability of circle 20
- Robot stability (doesn't fall apart) 10
- On schedule 20

Oral Presentation

- Style and level of detail (10 min max)
- Content
  - System engineering approach used
  - Member roles and division of work
  - Design of the robot
    - Architecture
    - Cost
  - Tests performed on the robot
  - Lessons Learned
    - What to do and not do next time

Documentation Package

- Data supporting oral presentation
- Detailed description of the robot
  - How to build it
  - How to control it
- Cost information
  - Information only
    - Do not optimize robot for cost

Peer evaluations

- Use form on next slide
- Used to determine the relative contribution of each member to the team's progress.
- For each square, ask "did X contribute more to our project than Y?"
- 1=yes, 0=no

Pair Wise Comparison

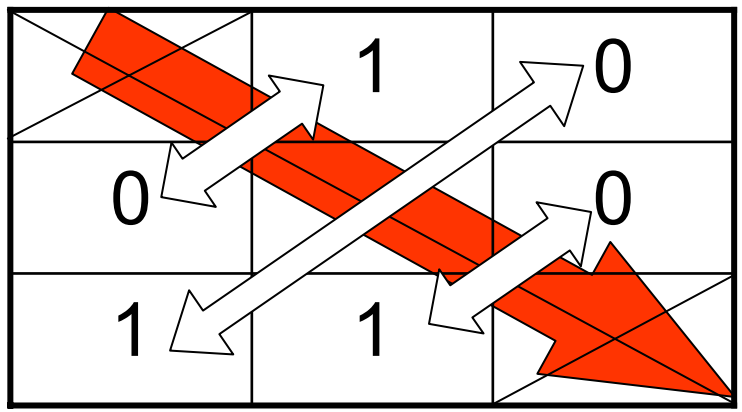
YOU	Barney	Fred	Wilma	Jane
Barney		B > F?	B > W?	B > J?
Fred	F>B?		F > W?	F > J?
Wilma	W>B?	W>F?		W > J?
Jane	J>B?	J>F?	J>W?	

Filled Evaluation Matrix

YOU	Barney	Fred	Wilma	Jane
Barney		1 (yes)	0 (no)	1
Fred	0		0	1
Wilma	1	1		1
Jane	0	0	0	

Rules for Completing

- Matrix shows a kind of symmetry about the major diagonal:



- If one entry is 1, the other must be 0. (If A does more than B, then B must have done less than A.

Member Evaluation

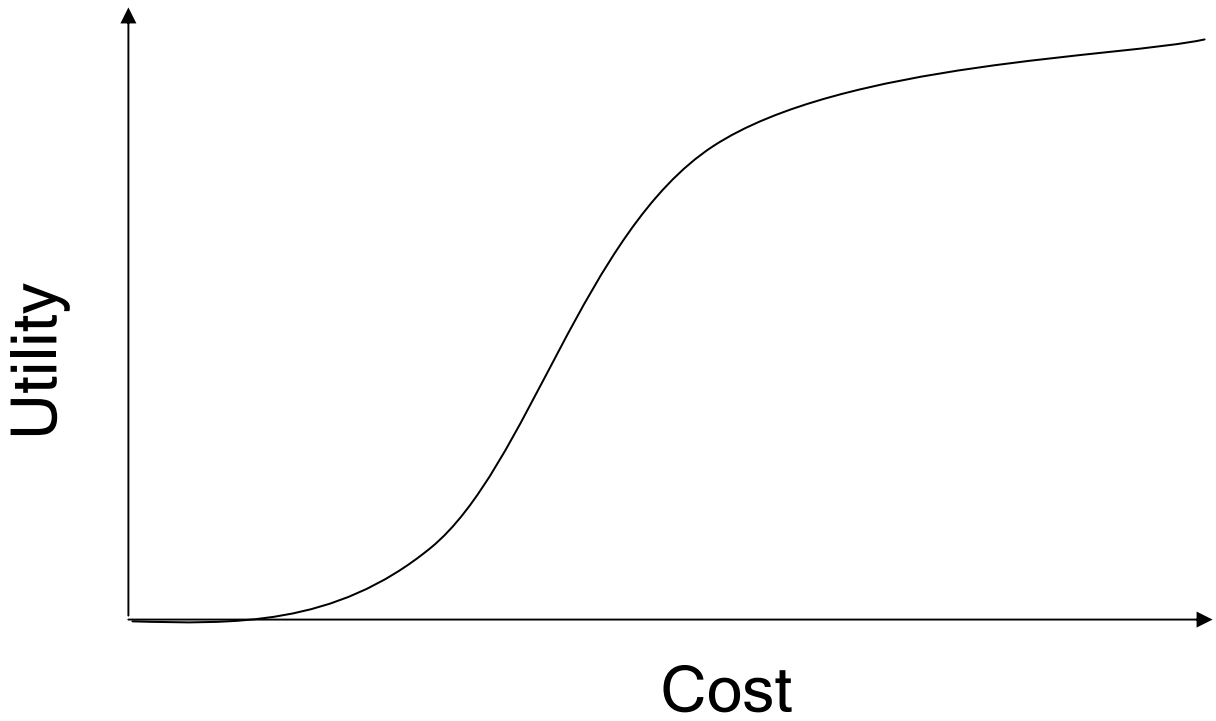
- Total along the rows:

YOU	Barney	Fred	Wilma	Jane	Σ=
Barney		1 (yes)	0 (no)	1	2
Fred	0		0	1	1
Wilma	1	1		1	3
Jane	0	0	0		0

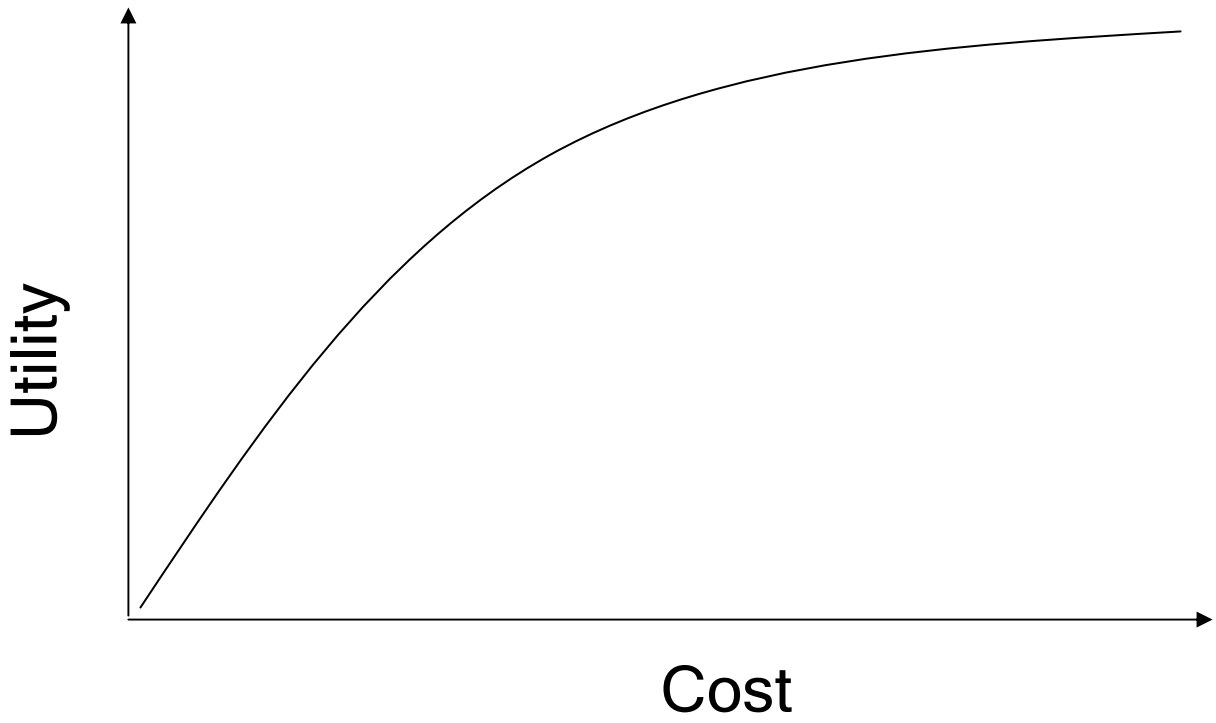
Scoring Process

- Each team member will fill out an evaluation sheet.
  - Privately, without consultation
- I will total the final scores for the group
- Results in relative scoring for each team member.
  - Minimum: 0 points
  - Maximum: (n-1)(n-2) points, where n = number of members in your group.

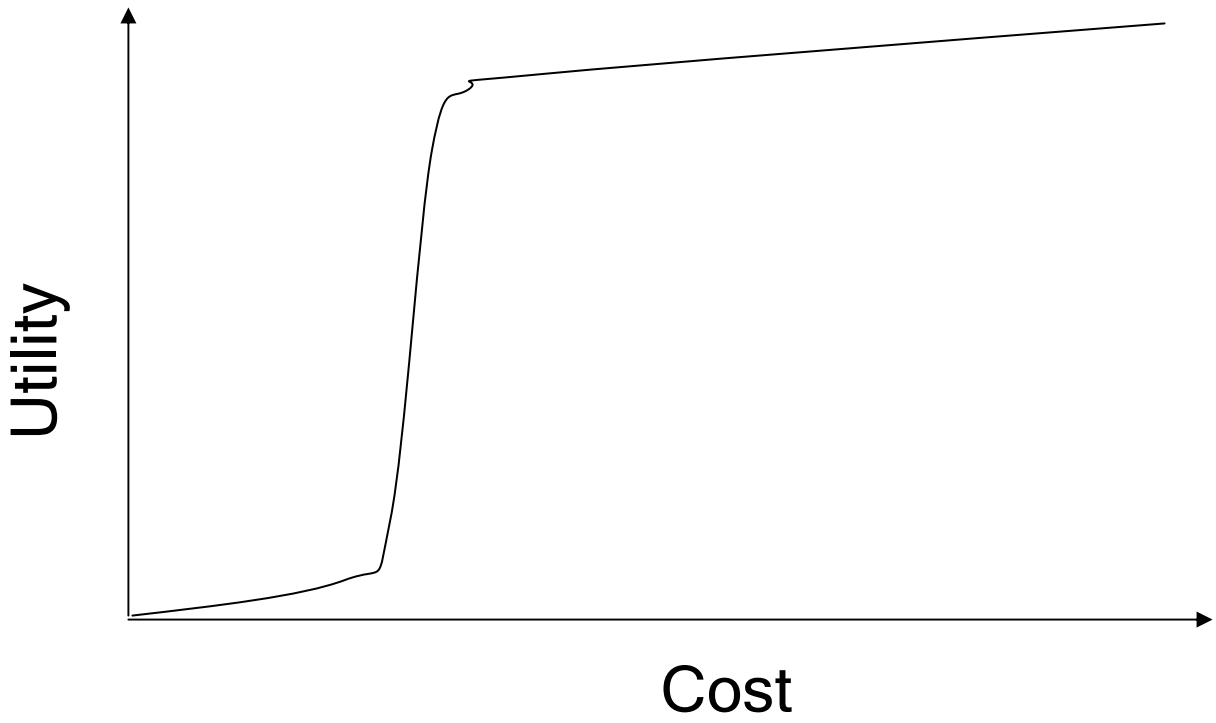
Utility Curves and Optimization



Utility Curves and Optimization



Utility Curves and Optimization



Assignments

- Reading
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- Homework
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