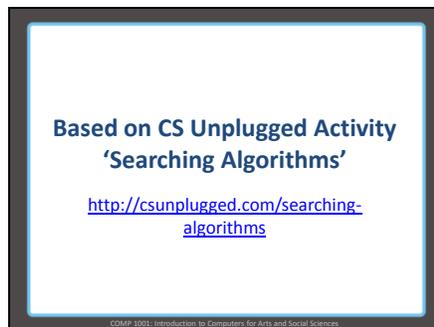


Slide 1



Slide 2



- Go read through activity to get more info

Slide 3



-Image:

-http://www.friendly-farms.com/images/organic-produce_4cab.jpg

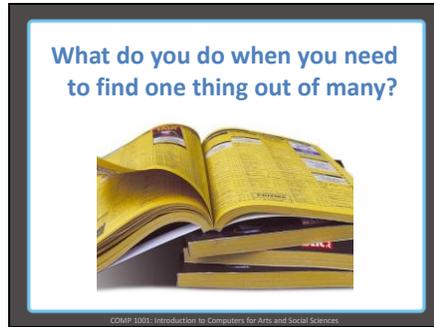
-Let's say you are a cashier at a grocery store and the power goes out.

-You need to figure out the prices of all the individual items so customers can be rung through manually.

-There's a master list somewhere that matches items with prices.

-Assuming you know the names of all the items, what's the best way to find the corresponding prices?

Slide 4



-Image:

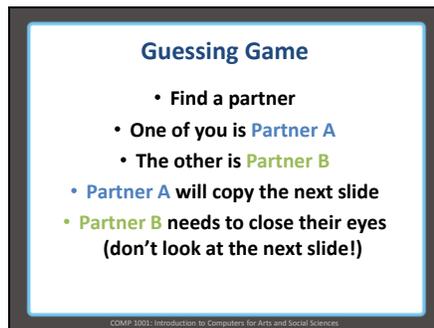
-http://www.calgary-city-maps.com/images/Calgary_phone_book.jpg

-Similarly, think about using a phone book.

-Imagine you have a phone number that you need to do a reverse look-up on (that is, figure out whose number it is).

-Compare this with how easy it is to find a phone number when you know someone's name.

Slide 5



Slide 6



Slide 7

Guessing Game

- Partner B will copy the next slide
- Partner A needs to close their eyes (don't look at the next slide!)

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Slide 8

Partner B: Write This

A = 1630	J = 88	S = 141
B = 9263	K = 3465	T = 4414
C = 4127	L = 1571	U = 3056
D = 405	M = 8625	V = 9118
E = 4429	N = 2587	W = 717
F = 7113	O = 7187	X = 7021
G = 3176	P = 5258	Y = 3076
H = 4015	Q = 8020	Z = 3336
I = 7976	R = 1919	

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Slide 9

Guessing Game

- Both partners circle one number/letter combo
- Tell your partner the number only
- Take turns guessing the corresponding letter of your partner's number (i.e. Find the "location" of the number)
- Keep track of how many guesses before you find it

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Slide 10

Guessing Game (II)

- Repeat the previous game with new numbers

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Slide 11

Partner A: Write This

A = 163	J = 3972	S = 7542
B = 445	K = 4208	T = 7956
C = 622	L = 4871	U = 8094
D = 1410	M = 5031	V = 8672
E = 1704	N = 5283	W = 9137
F = 2169	O = 5704	X = 9224
G = 2680	P = 6025	Y = 9508
H = 2713	Q = 6801	Z = 9663
I = 2734	R = 7440	

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Slide 12

Partner B: Write This

A = 33	J = 3519	S = 6625
B = 183	K = 4055	T = 6771
C = 730	L = 5548	U = 6831
D = 911	M = 5655	V = 7151
E = 1927	N = 5785	W = 7806
F = 1943	O = 5897	X = 8077
G = 2200	P = 5905	Y = 9024
H = 2215	Q = 6118	Z = 9328
I = 3451	R = 6296	

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Slide 13

Guessing Game (II)

- Both partners circle one number/letter combo
- Tell your partner the number only
- Take turns guessing the corresponding letter of your partner's number (i.e. Find the "location" of the number)
- Keep track of how many guesses before you find it

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Slide 14

Guessing Game (II)

- What's special about the way these numbers were arranged?
- How many guesses did it take to find the right letter this time?

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Slide 15

Guessing Game (III)

- One more time!

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Slide 16

Partner A: Write This

0	1	2	3	4	5	6	7	8	9
A = 9047	C = 3080		E = 5125	H = 8051	L = 7116	O = 6000	R = 9891	V = 4392	W = 1062
B = 1829	D = 9994		F = 1480	I = 1481	M = 8944	P = 7432	S = 1989		X = 2106
			G = 8212	J = 4712	N = 4128	Q = 4110	T = 2050		Y = 5842
				K = 6422			U = 8199		Z = 7057

0	1	2	3	4	5	6	7	8	9
A-D	E-G	H-J	K	L-N		O-Q	R-U	V-X	Y-Z

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Slide 17

Partner B: Write This

0	1	2	3	4	5	6	7	8	9
A = 9308	E = 6519	H = 1524	K = 4135	L = 9050		O = 4200	R = 3121	V = 2385	Y = 1990
B = 1478	F = 2469	I = 8112		M = 1265		P = 7153	S = 9503	W = 5832	Z = 2502
C = 8417	G = 5105	J = 2000		N = 5711		Q = 6028	T = 1114	X = 1917	
D = 9434							U = 7019		

0	1	2	3	4	5	6	7	8	9
A-B	C-D		E-G	H-K	L-N	O-Q	R-U	V	W-Z

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Slide 18

Guessing Game (III)

- **Rule: Add digits of a number. The last digit in the result gives the column that number will be in.**

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Slide 19

Guessing Game (III)

- Both partners circle one number/letter combo
- Tell your partner the number only
- Take turns guessing the corresponding letter of your partner's number (i.e. Find the "location" of the number)
- Keep track of how many guesses before you find it

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Slide 20

Guessing Game (III)

- How many guesses this time?
- What would be min/max guesses?
- What are the advantages/disadvantages of this searching method compared to the first two?

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Slide 21

Linear Searching Demonstration

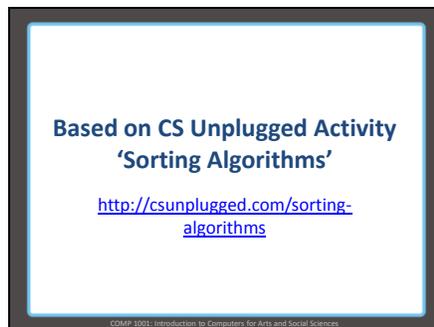
<http://www.cosc.canterbury.ac.nz/mukundan/dsal/LSearch.html>

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Slide 22

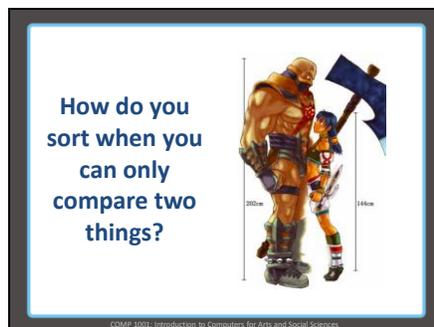


Slide 23



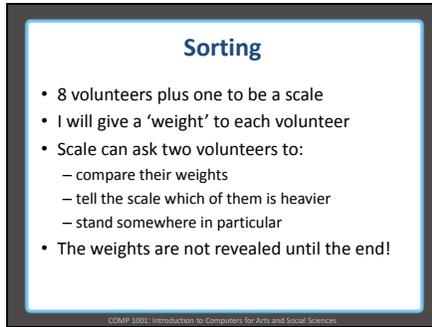
- Go read through activity to get more info
- We needed sorted lists to find numbers quickly in previous activity – how do we sort things efficiently?

Slide 24



- Image:
 - http://images3.wikia.nocookie.net/soulcalibur/images/9/93/Height_Comparison.jpg
- Computers only compare two things at a time, show how do they sort efficiently?

Slide 25

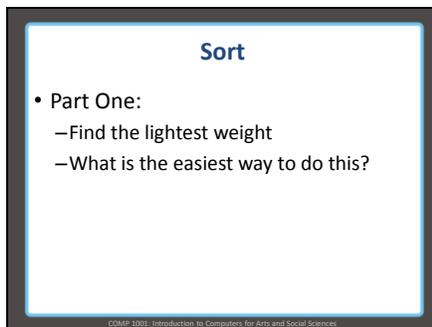


Sorting

- 8 volunteers plus one to be a scale
- I will give a 'weight' to each volunteer
- Scale can ask two volunteers to:
 - compare their weights
 - tell the scale which of them is heavier
 - stand somewhere in particular
- The weights are not revealed until the end!

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Slide 26

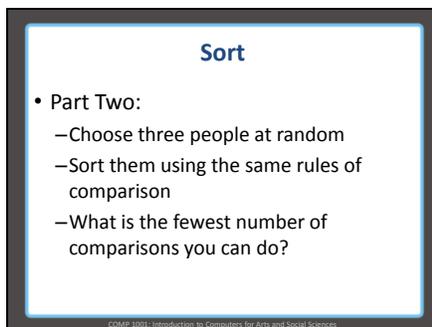


Sort

- Part One:
 - Find the lightest weight
 - What is the easiest way to do this?

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Slide 27



Sort

- Part Two:
 - Choose three people at random
 - Sort them using the same rules of comparison
 - What is the fewest number of comparisons you can do?

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Slide 28

Sort

- Part Three:
 - Sort everyone from lightest to heaviest using the same comparison rules

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Slide 29

Selection Sort

- Find lightest and put aside
- Find next lightest and put aside next to the first lightest
- Find the next lightest and put aside next to the second lightest, etc...
- Repeat until everyone has been put aside
- How many comparisons did it take?

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Slide 30

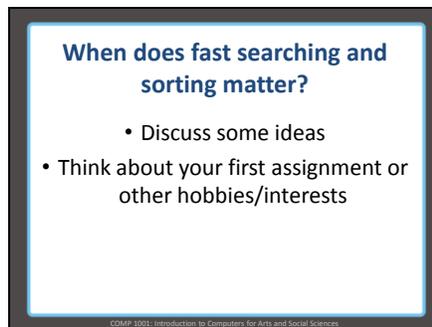
Quicksort

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- Pick a person at random and have them stand in front of the others
 - This is your pivot
- Go through the rest of the group, and compare them with your pivot
 - Put lighter people on one side, heavier people on the other
- Leave your pivot alone, and pick one of the groups on the left or the right
 - Repeat the whole thing with that group – that is, find a pivot, move lighter people to the left, heavier people to the right
 - Be sure to keep this entire group on the same side as the original pivot as you are sorting

it
-Keep doing this for every group that has more than one item.

Slide 31

A slide with a black border and a light blue background. The text is centered and includes a question and two bullet points.

When does fast searching and sorting matter?

- Discuss some ideas
- Think about your first assignment or other hobbies/interests

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Slide 32

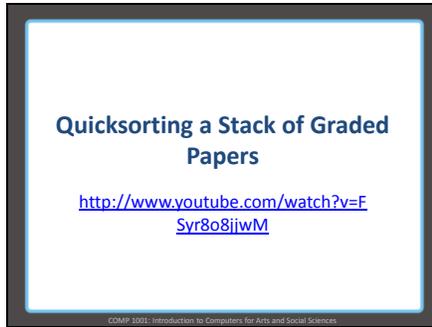
A slide with a black border and a light blue background. The text is centered and includes a title and a URL.

Sorting Review, CS Unplugged Style

http://www.youtube.com/watch?v=cVMKXKoGu_Y

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Slide 33



Quicksorting a Stack of Graded Papers

<http://www.youtube.com/watch?v=F5yr8o8ijwM>

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Slide 34



Selection Sort Demo

<http://www.cosc.canterbury.ac.nz/mukundan/dsal/SSort.html>

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Slide 35



Quicksort Demo

<http://www.cosc.canterbury.ac.nz/mukundan/dsal/QSort.html>

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Slide 36



Sorting Networks

<http://www.youtube.com/watch?v=L0xfdsBBiKI>

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