ECSE 424/542

Human-Computer Interaction (HCI)

www.cim.mcgill.ca/~jer/courses/hci

Agenda

- Administrivia
- What is this course all about?
- Is it right for me?
- A few exercises

If you recently registered…

- If you did not receive a mail message with Moodle registration information, please write your McGill email address on a piece of paper and bring it to me!

www.cim.mcgill.ca/~jer/courses/hci

- everything you need to know is there
  - Syllabus: readings, project info, etc.
  - Learning objectives
  - Evaluation methods and grading scheme
  - Software tools we'll be using
  - Office hours
  - Read the questions & course guide!

Let’s get started with an exercise

Exercise

- pretend it’s 2000: draw a computer
- back to 2015: draw a computer

2000 era

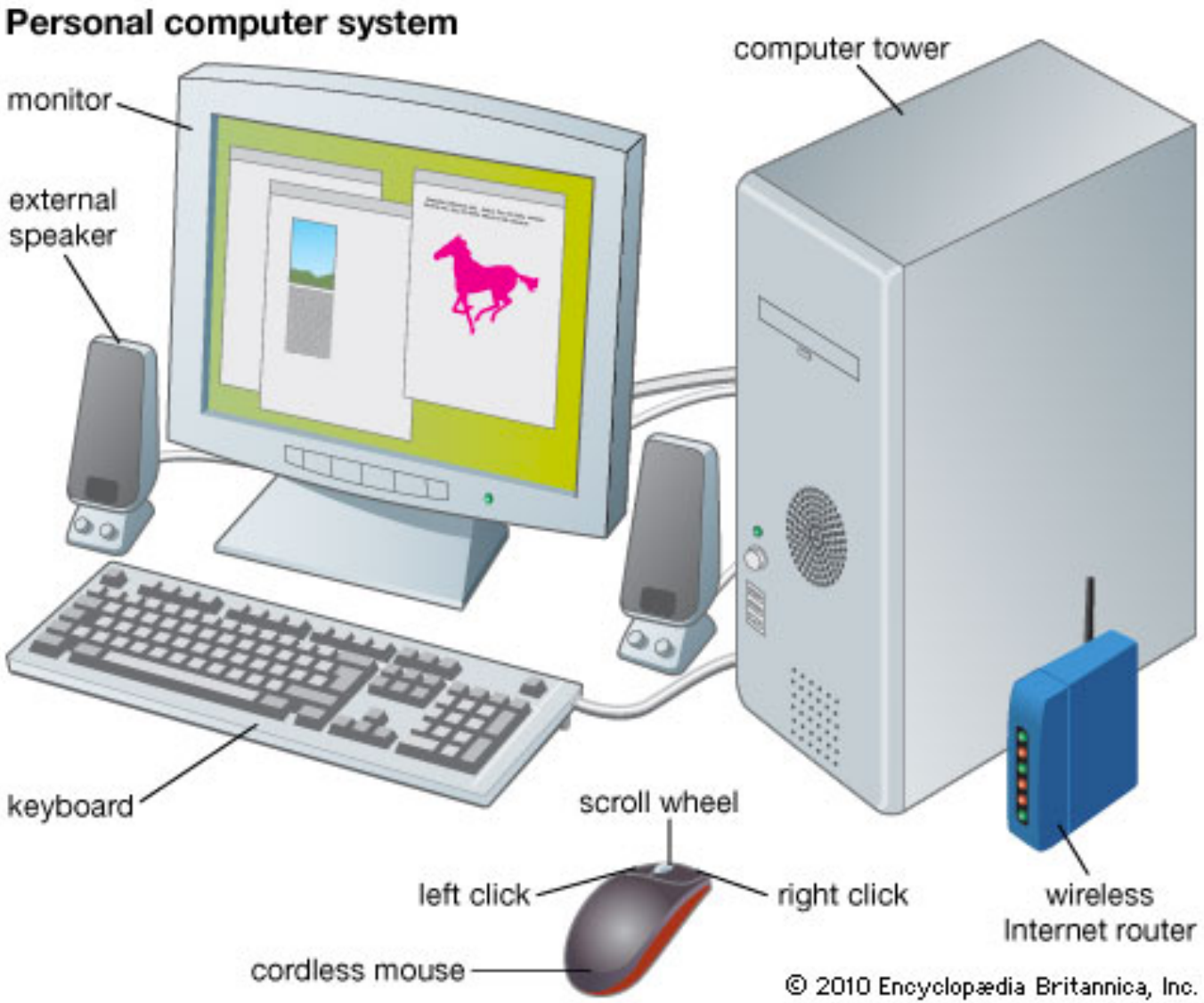
Today


68°
52
89
11:15AM TRAINING WITH KRISTA
WED
12
UV
3.6
1:09PM +3HRS
NYC

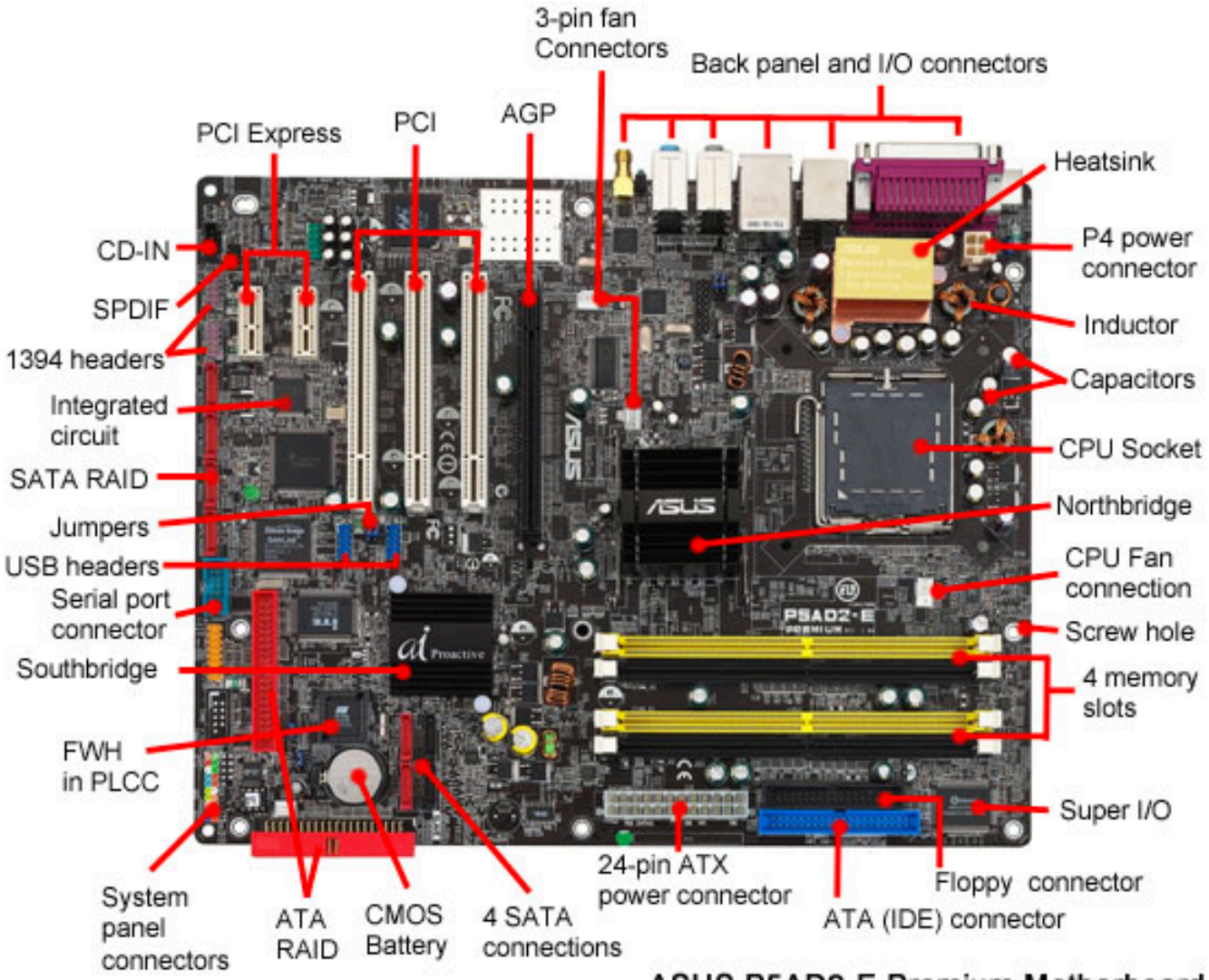

16:34


1:59
Sunday, April 9
Lenovo

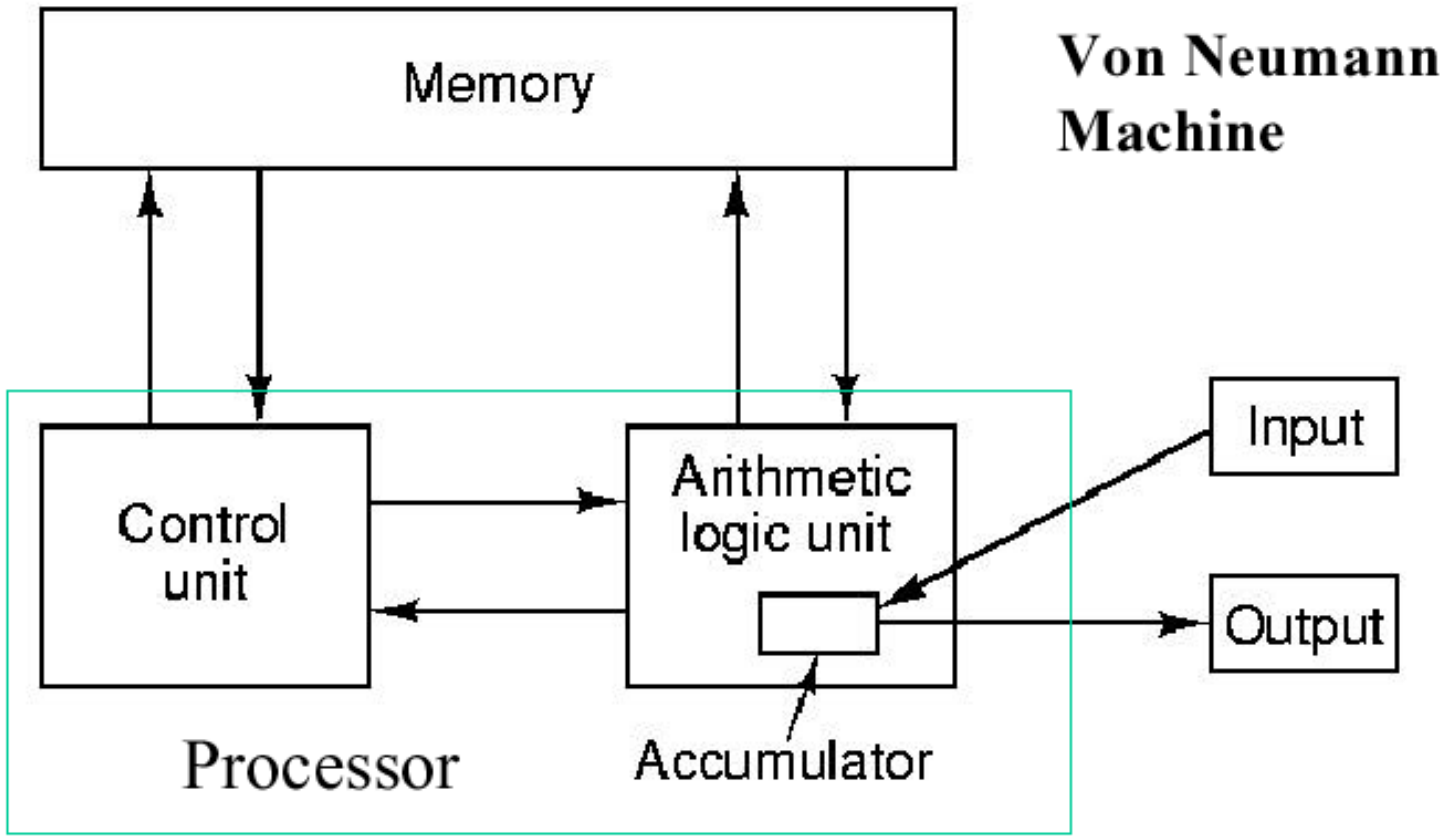
Which part is the computer?



Anybody draw this?



How many took ECSE 324?

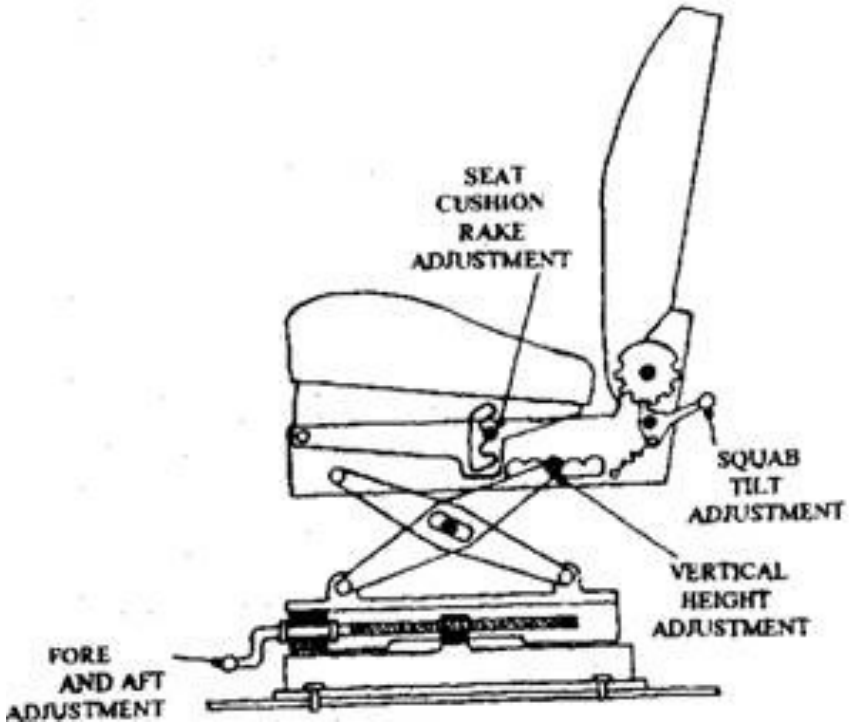


Lesson: Our view of the computer is inherently tied to the interface

Exercise (2 minutes)

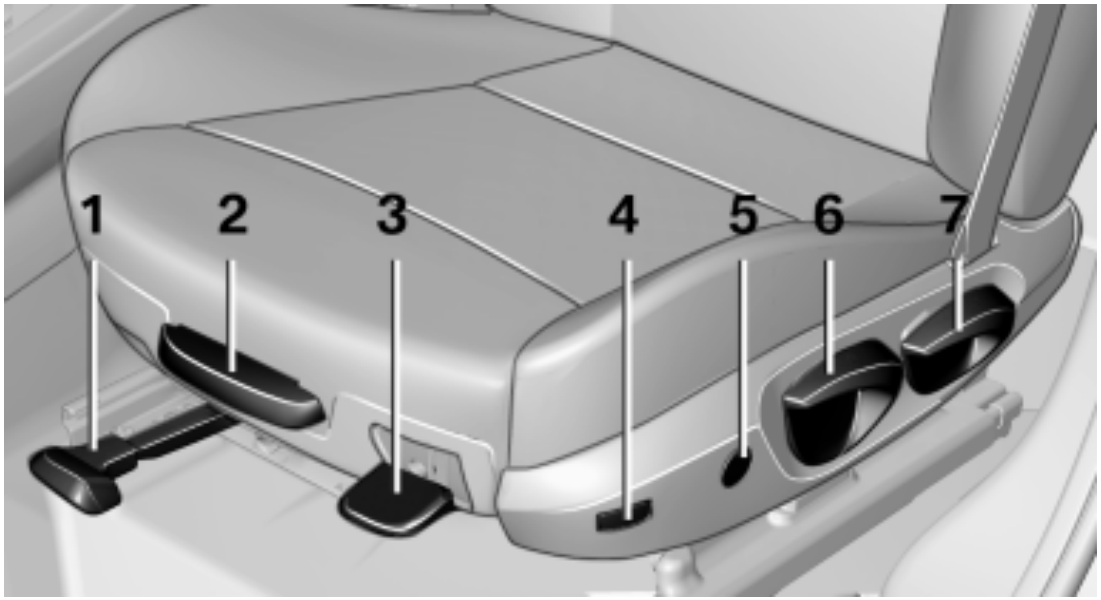
- Design a better controller allowing you to adjust your car seat:

1 Forward/backward
~~2 Thigh support~~
3 Seat tilt
~~4 Backrest width~~
~~5 Lumbar support~~
6 Height
~~7 Backrest tilt~~



A possible solution

1 Forward/backward
2 Thigh support
3 Seat tilt
4 Backrest width
5 Lumbar support
6 Height
7 Backrest tilt



Exercise (3 minutes)

- exchange your design with the person sitting next to you
  - which one appears easier to use? why?
  - can you suggest any improvements?

Why is this better?

What this course is all about

- How do we ensure that the interfaces we design and implement between humans and computers assist our activities effectively?

What is HCI?

"... about designing computer systems that support people so that they can carry out their activities productively and safely." *Preece et al., 1994*

"…the study of people, computer technology and the ways these influence each other." Dix et al., 1993

"… the design and use of computer technology, focusing particularly on the interfaces between people (users) and computers." Wikipedia

Video: Intelligent Home Critique

Exercise (3 minutes)

- Part 1: make a list of all the problems you identified in the previous video

Exercise (5 minutes)

- Part 2: exchange the list with the person beside you and identify which of these problems constitute issues addressed by the field of Human-Computer Interaction

Why not to take this course

- you don't get an A for memorizing or being a great mathematician
  - Fitts' Law for movement tasks: ID = $\log_2$ (2A/W)
- it's going to be challenging and a lot of work
- sample comment from a previous course evaluation:

  "I do know that I have worked harder in this course than in some 5 credit courses I have taken and probably will not do as well..."

Why take this course?

- it's going to be challenging
- you'll learn valuable skills
- you'll get a chance to be creative and exercise your design skills
- continuing the previous course evaluation comment:

  ".. This is more than made up by the interesting content of the course and overall quality of the lectures."

This requires that we learn about:

- joint performance of tasks by humans & machines
- communication between human & machine
- human capabilities to use machines
- methodologies for designing and building interfaces
- achieving usability
- interface paradigms

Homework: Complete before next class

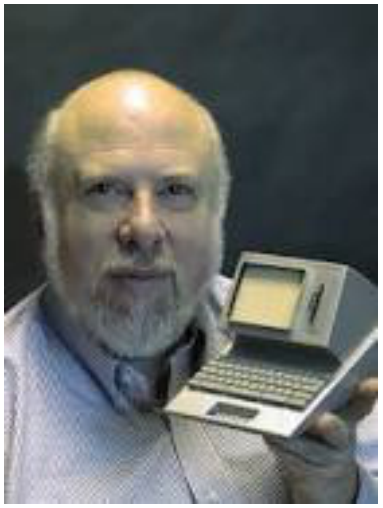
- Readings for today:
  - Norman: The Psychology of Everyday Things
  - Raskin: Intuitive Equals Familiar
  - (others are optional)

Don Norman: The Psychology of Everyday Things

"POET" introduces the principles of affordances, conceptual models, mapping, visibility, and feedback

- UCSD Prof
- IDEO fellow
- VP @ Apple
- Exec @ HP
- One of world's most influential designers

Jef Raskin: Intuitive Equals Familiar



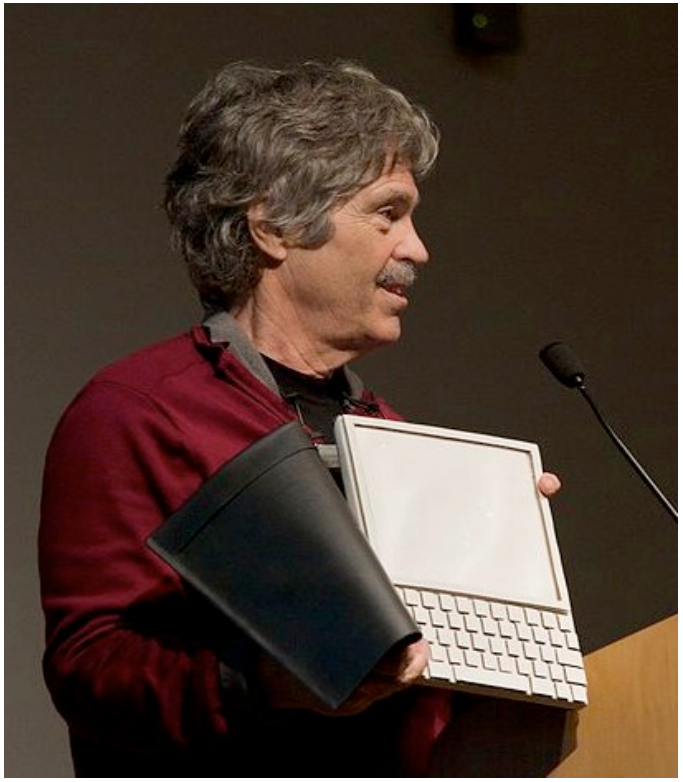
Discusses the relationship between intuitive, natural, familiar, and skills transfer

- Began career writing product manuals
- Envisioned PC as consumer appliance (in the 1970s)
- Credited as Father of the Macintosh

Homework: Complete before next class

- Readings for today:
  - Norman: The Psychology of Everyday Things
  - Raskin: Intuitive Equals Familiar
  - (others are optional)
- Videos for today:
  - Norman: Affordances, Signifiers, Conceptual Models
    Kay: Doing with Images Makes Symbols
    - you may be interested in reading his bio on Wikipedia
  - Mantei: The Strauss Mouse

Alan Kay:
Doing with Images Makes Symbols



Kay with Dynabook prototype

- brought us the concept of laptop and tablet computers in 1968
- his video surveys significant developments in HCI from Sutherland, Engelbart and others (1960s)

"The best way to predict the future is to invent it."

Exercise:
When were these invented (and by whom)?

Homework: Complete before next class

- Readings for today:
  - Norman: The Psychology of Everyday Things
  - Raskin: Intuitive Equals Familiar
  - (others are optional)

- Readings for Thursday:
  - Stolzoff: The Formula for Phone Addiction Might Double as a Cure
  - Harris: How Technology Hijacks People's Minds

Tristan Harris

- Graduated from Persuasive Technology Lab @ Stanford
- Spent three years as a Design Ethicist at Google
- Had an awakening to how technology is being designed to “hijack our minds”
- Started the Center for Humane Technology and co-founded the Time Well Spent movement.

Homework: Complete by Sep. 10

- More readings and videos
- Yearbook entry
- Exercise 1: Design Critique

Interaction beyond the classroom

- Use Moodle for on-line class communication
- Office hours: Thu 10-11* in MC 424
  or by appointment

*exceptionally this week, Thu 11-12

If you recently registered…

- If you did not receive a mail message with Moodle registration information, please write your McGill email address on a piece of paper and bring it to me!

Evaluation

component	weight
assessment of learning	**30%**
• individual learning	25%
• group learning	5%
project (2-3 students)	**70%**
• deliverables x 6	48%
• assessment of teamwork	2%
• presentation	6%
• peer review activities	14%

- Bonus credit will be given based on questions contributed to and answered on Peerwise
- Grads enrolled in ECSE 542 carry out an additional course component for the extra course credit–will discuss in ~2 weeks

In-Class Assessment

- some classes will begin with an assessment of your learning
- if you miss one of these classes, don't panic – your worst grade is not counted
- we'll be using Learning Catalytics both for discussion questions and for learning assessment – info on signing up for license keys will be provided in the next few weeks

Class Format

- classes involve one or more of:
  - review and discussion of the assigned materials
  - exercises to reinforce the concepts
  - a guest lecture by an expert on the class topic

Term Project Themes: Previous Years

- physically distributed, multimodal, context-aware systems
- technologies for education, healthcare, transportation
- interactive technologies for the visually impaired
- games for rehabilitation
- augmenting human capabilities
- improving communication systems

How the project works

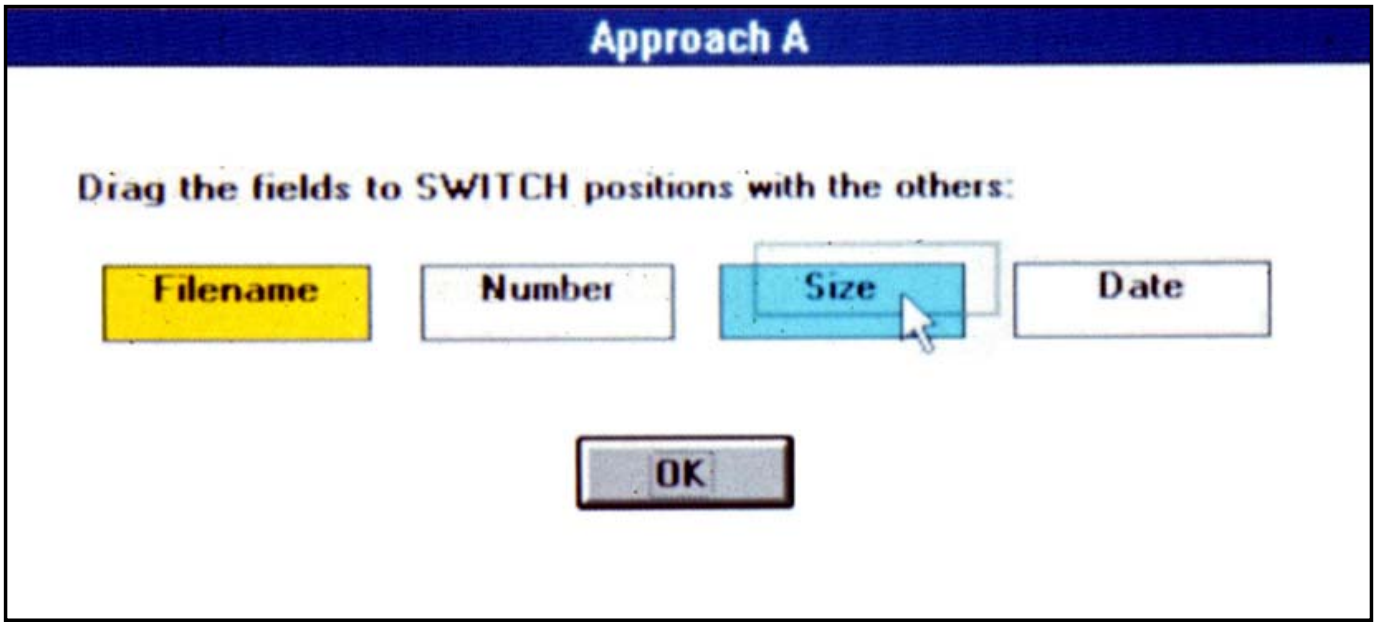
- first steps
- repeat
  - develop/refine understanding of user
  - design user interface
  - prototype interactive human-computer system
  - evaluate the prototype
- until end of course

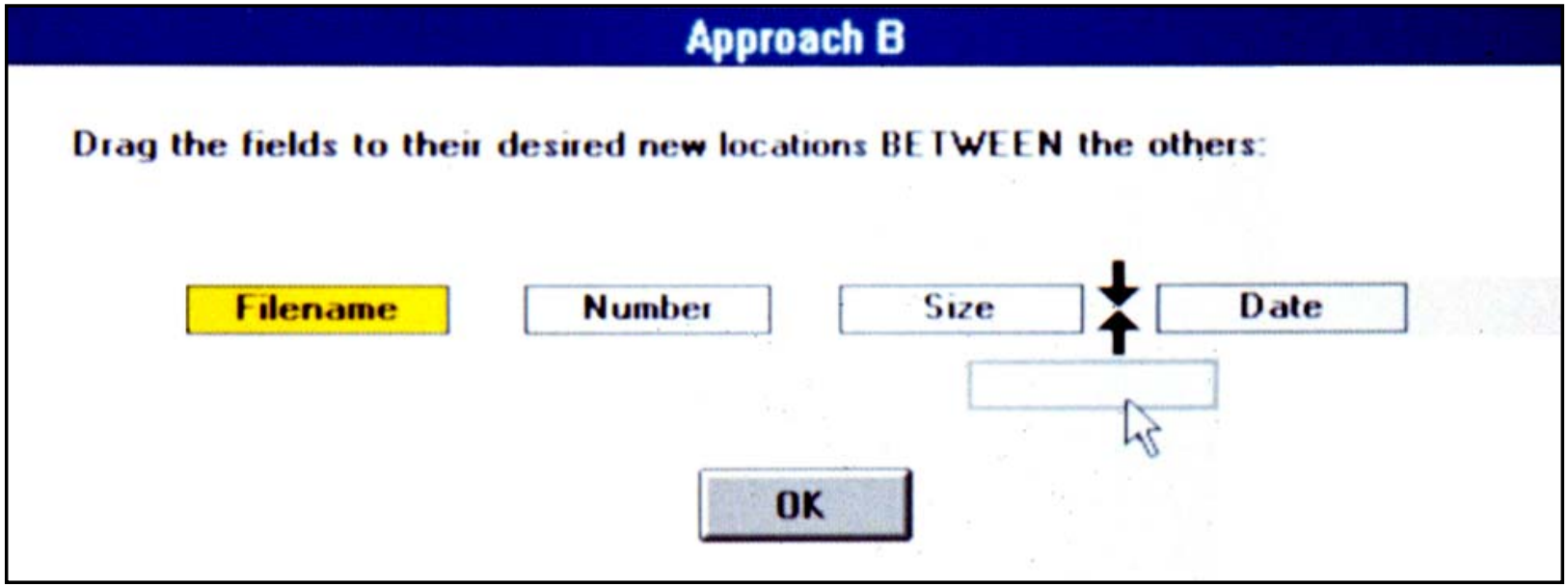
First steps

- brainstorm of problem category and type of solution(s)
- guided observation of target user population
- develop/refine project idea to best serve users' needs
- validate idea – project pitch
- submit project proposal

A more mundane exercise

- We'd like to design a UI that lets users re-order the columns in a table


Approach A
Drag the fields to SWITCH positions with the others:
Filename
Number
Size
Date
OK


Approach B
Drag the fields to their desired new locations BETWEEN the others:
Filename
Number
Size
Date
OK

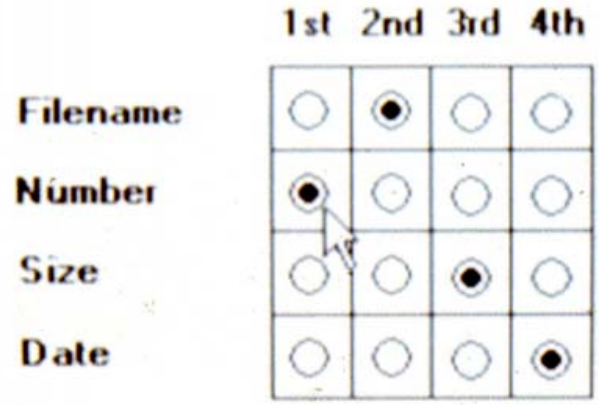
Approach C

Use the buttons to re-order the fields:

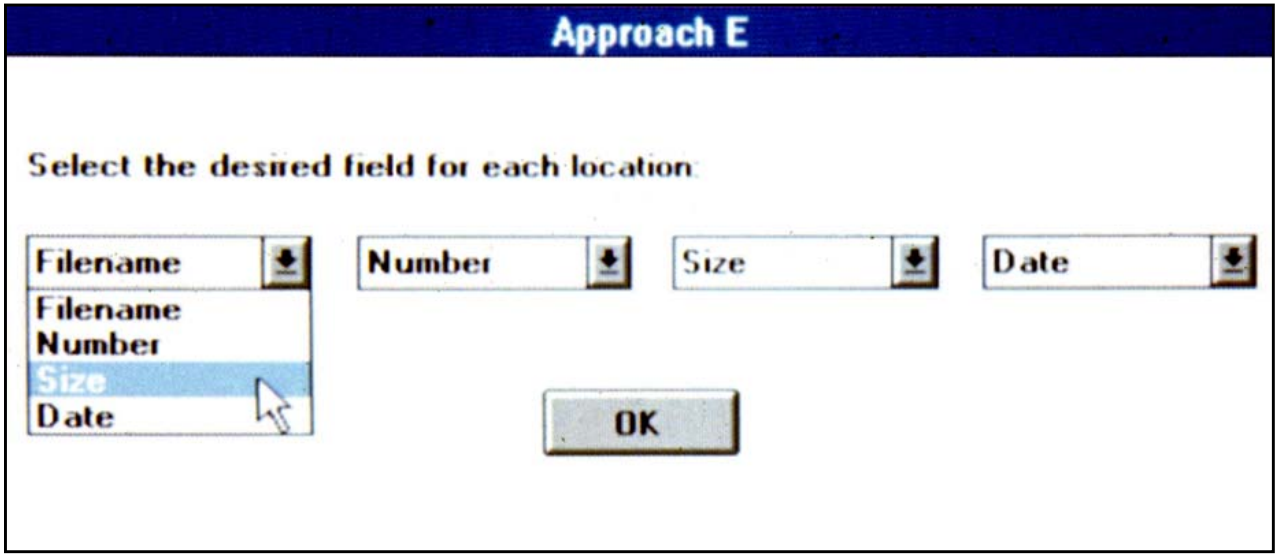
OK

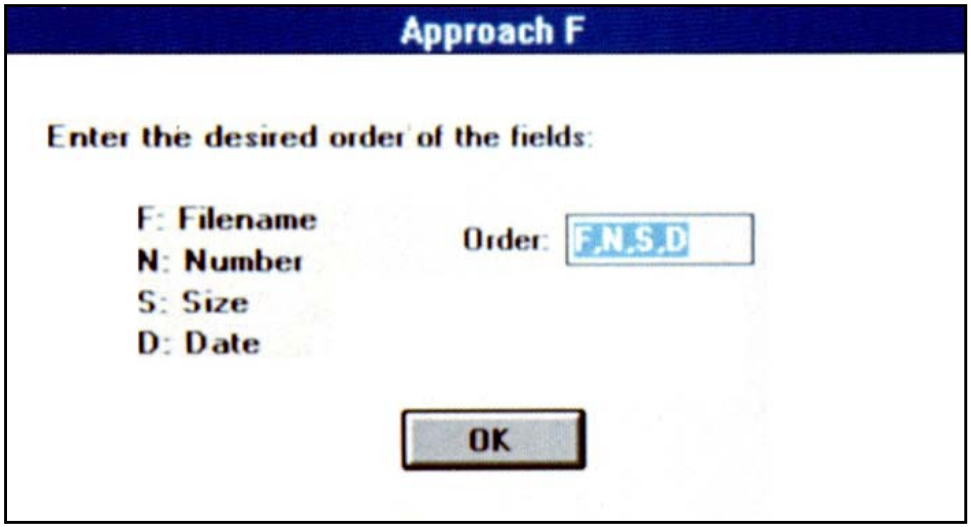
Approach D

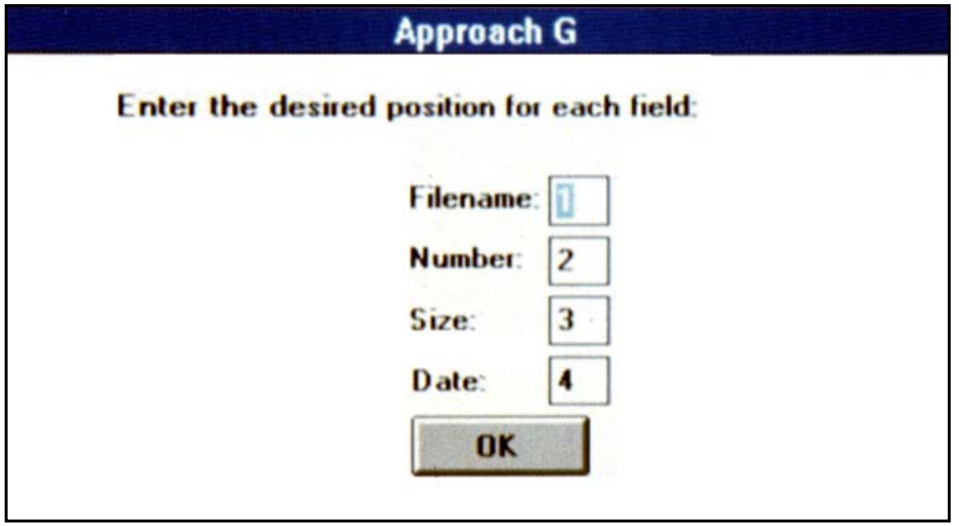
Use the radio buttons to re-order the fields:



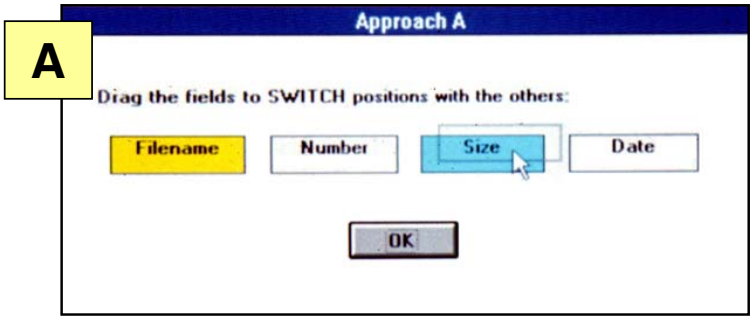
OK

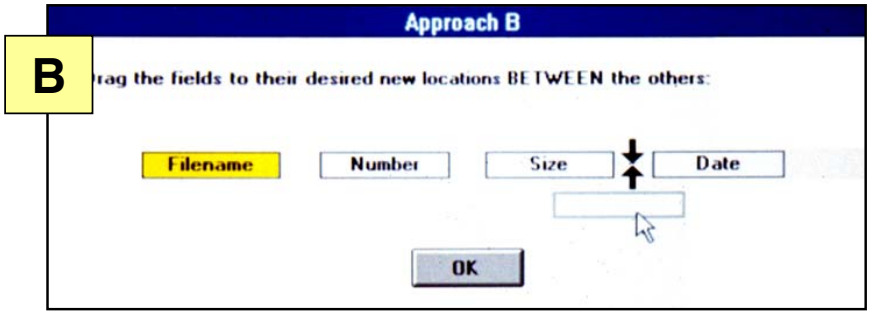

Approach E
Select the desired field for each location:
Filename
Number
Size
Date
Filename
Number
Size
Date
OK

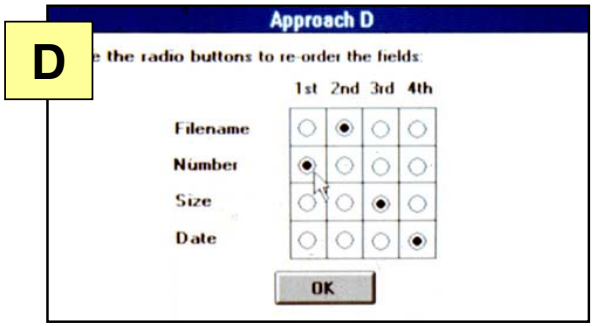

Approach F
Enter the desired order of the fields:
F: Filename
N: Number
S: Size
D: Date
Order:
F,N,S,D
OK

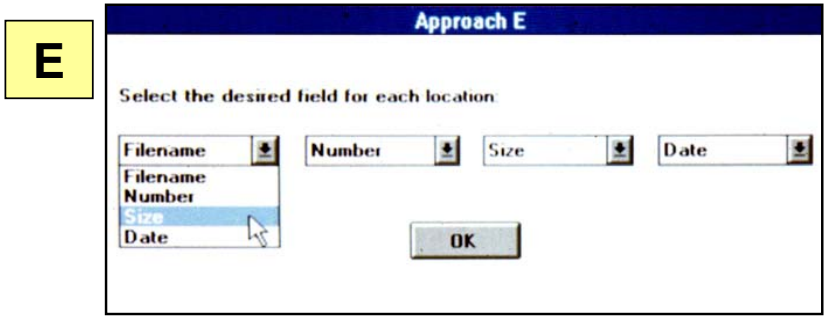

Approach G
Enter the desired position for each field:
Filename:
1
Number:
2
Size:
3
Date:
4
OK

Which method do you think is most efficient?









A. Drag Drop On

B. Drag Drop Between

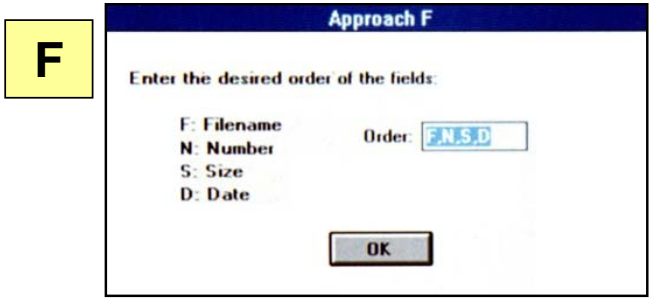
C. Icons

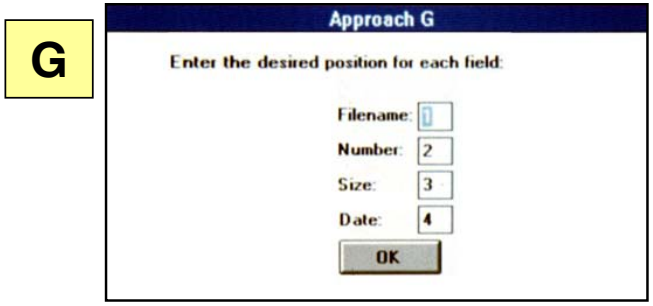
D. Radio Buttons

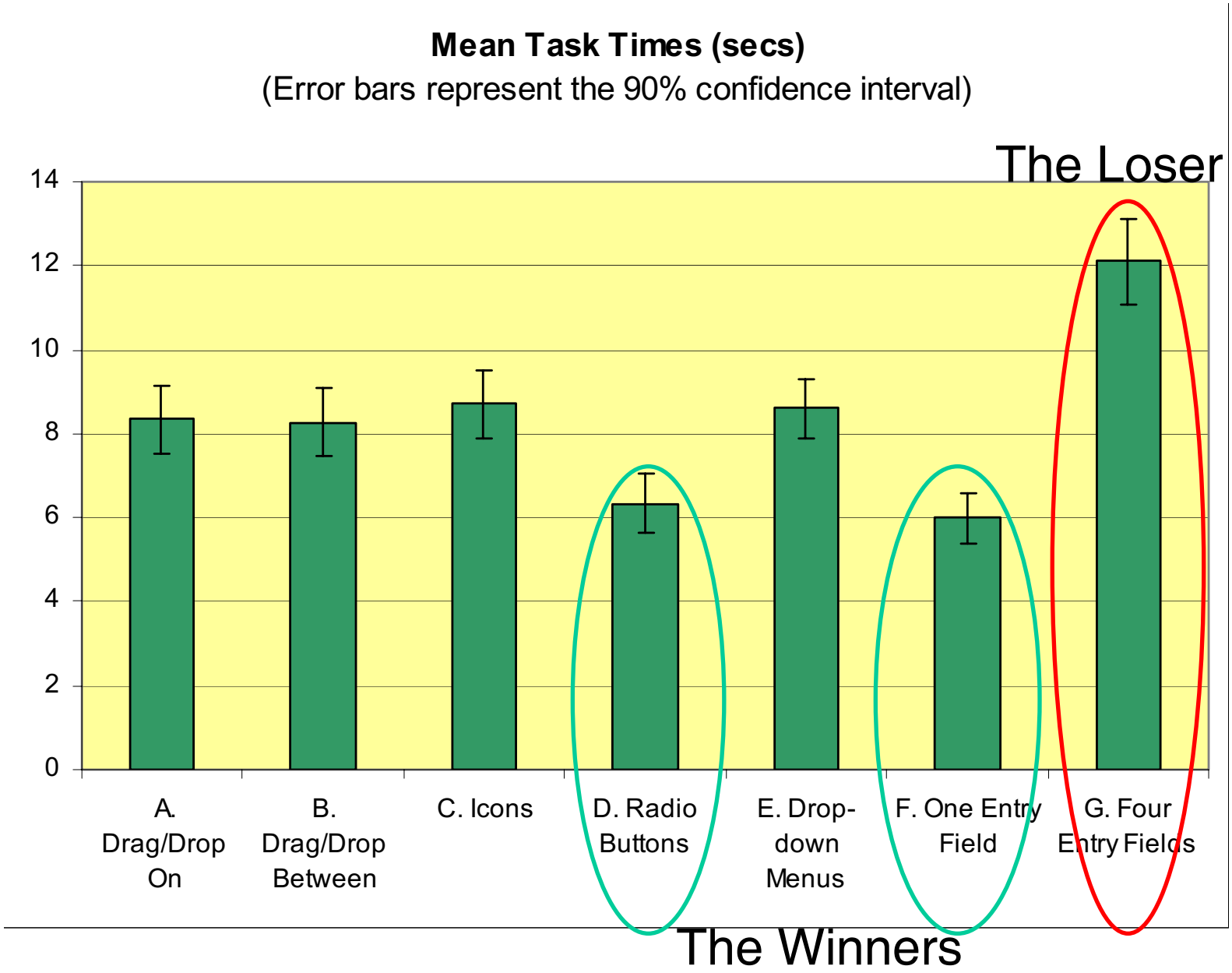
E. Drop-down menus

F. One entry field

G. Four entry fields






Mean Task Times (secs)
(Error bars represent the 90% confidence interval)
The Loser
14
12
10
8
6
4
2
0
A. Drag/Drop On
B. Drag/Drop Between
C. Icons
D. Radio Buttons
E. Drop-down Menus
F. One Entry Field
G. Four Entry Fields
The Winners