

Introduction to Design

Professor Larry Heimann
Application Design & Development
Information Systems Program

What is
design

really
about?





“Best.Phone.Ever.”

Computerworld, 8/30/07

“Traditional cell phones are dull, limited, and at end-of-life. iPhone is glorious, and it is only the beginning.”

Bruce Tognazzini, *Nielsen Norman Group*

“It's extremely easy to use and almost entirely self-discoverable... and it's just plain fun to use.”

Arstechnica review, 7/9/07

Google



Google Search

I'm Feeling Lucky

Understanding users

- How do they go about doing their work?
- Under what conditions do they have to work?
- Is there anything that can be done to simplify tasks?
- What mistakes are they prone to making?
- What are their abilities and limitations?
- WHO ARE THEY???

[Analytics Settings](#)

View Reports:

www.biblequizstats.org

My Analytics Accounts:

www.biblequizstats.org

Dashboard

Visitors

Overview

Map Overlay

New vs. Returning

Languages

▶ Visitor Trending

▶ Visitor Loyalty

▶ Browser
Capabilities

▶ Network Properties

User Defined

Traffic Sources

Content

Goals

Settings

Email

Help Resources

? [About this Report](#)? [Conversion University](#)? [Common Questions](#)? [Report Finder](#)

Visitors Overview

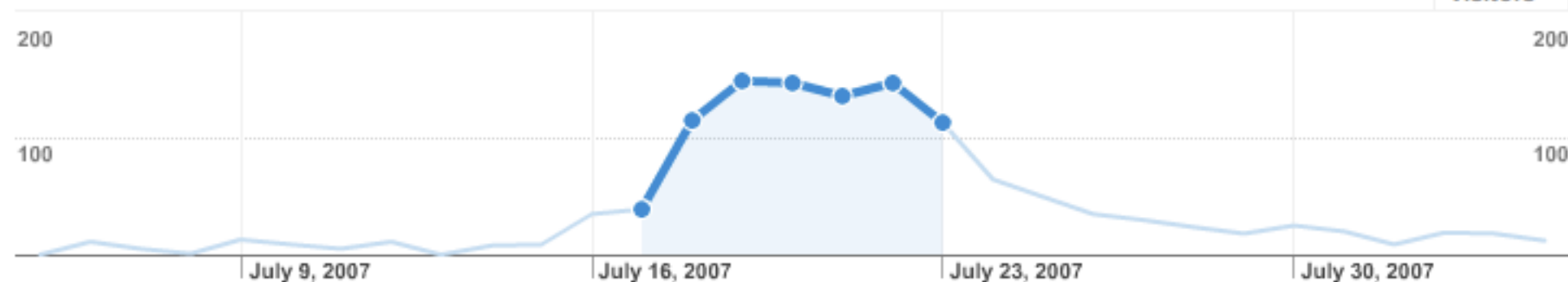
Jul 17, 2007 - Jul 23, 2007

Export

Email

Add to Dashboard

Visitors



425 people visited this site

2,030 [Visits](#)425 [Absolute Unique Visitors](#)28,801 [Pageviews](#)14.19 [Average Pageviews](#)00:09:00 [Time on Site](#)6.90% [Bounce Rate](#)19.36% [New Visits](#)

Visitor Segmentation

Visitors Profile: [languages](#), [network locations](#), [user defined](#)Browser Profile: [browsers](#), [operating systems](#), [browser and operating systems](#), [screen colors](#), [screen resolutions](#), [java support](#), [Flash](#)[Map Overlay](#)

Geolocation visualization

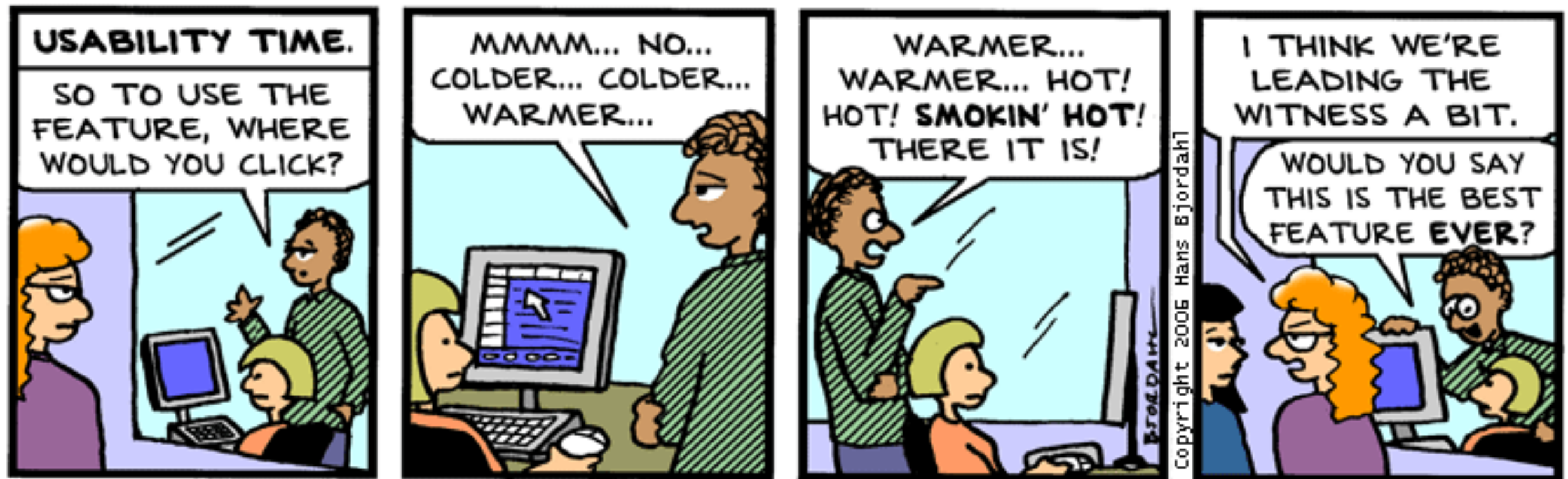
Technical Profile

Browser	Visits	% visits	Connection Speed	Visits	% visits
Internet Explorer	1,662	81.87%	Cable	795	39.16%
Firefox	266	13.10%	DSL	523	25.76%
Safari	77	3.79%	Unknown	396	19.51%



**Spending
Time
With
Users...**

Learning from users



Bug Bash by Hans Bjordahl

<http://www.bugbash.net/>

Documenting findings

- Profiles
- Use cases
- Test cases

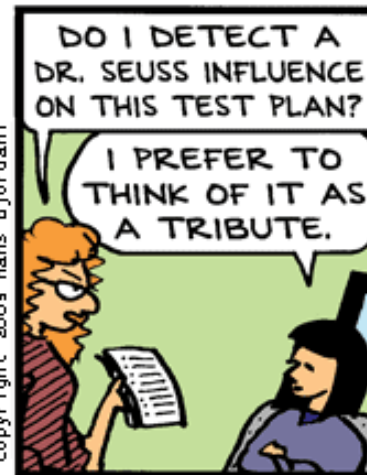
A-Level Use Cases		
Use Case Name	Actor(s)	Description
Add Curriculum	Admin	The user can add a new curriculum to the system that can be used for chess camps.



Bug Bash by Hans Bjordahl



Copyright 2005 Hans Bjordahl

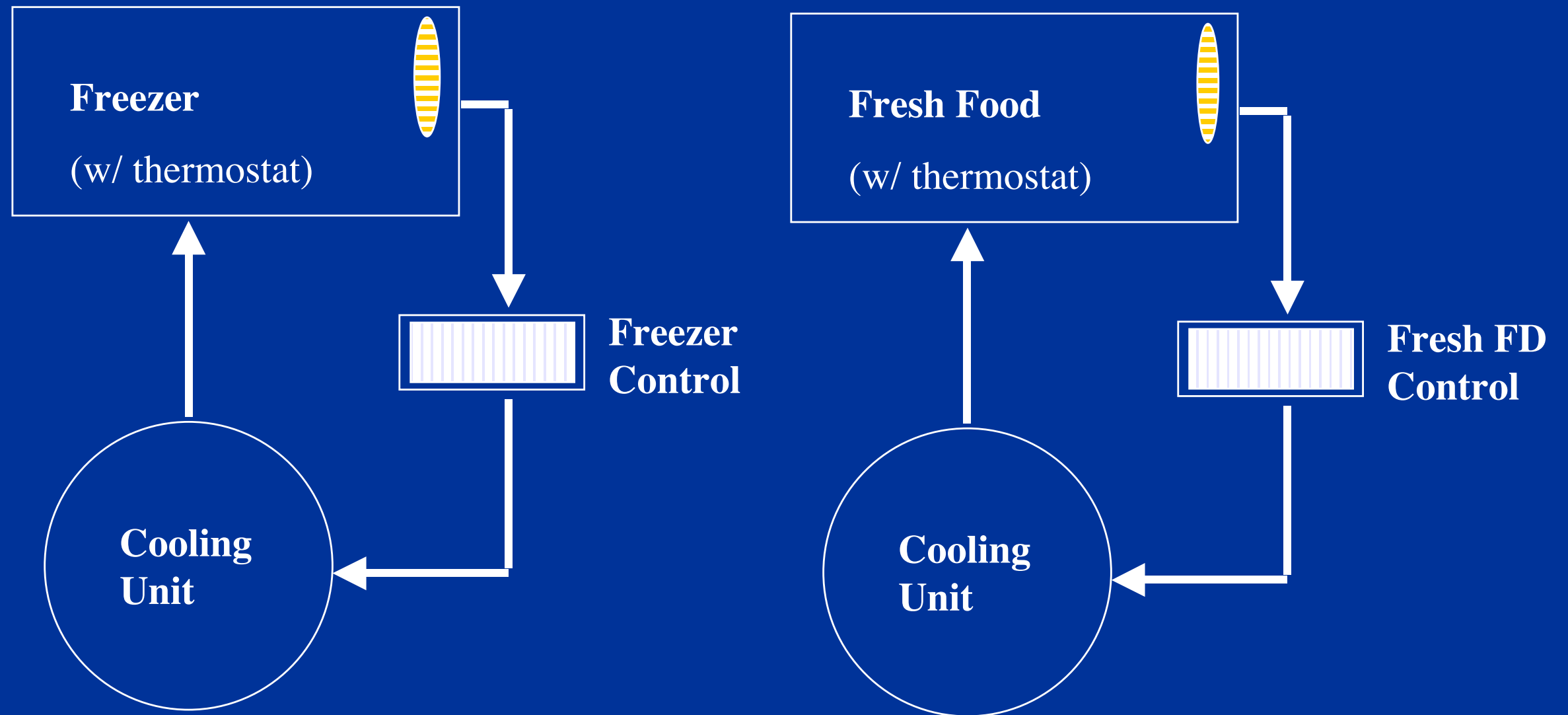


<http://www.bugbash.net/>

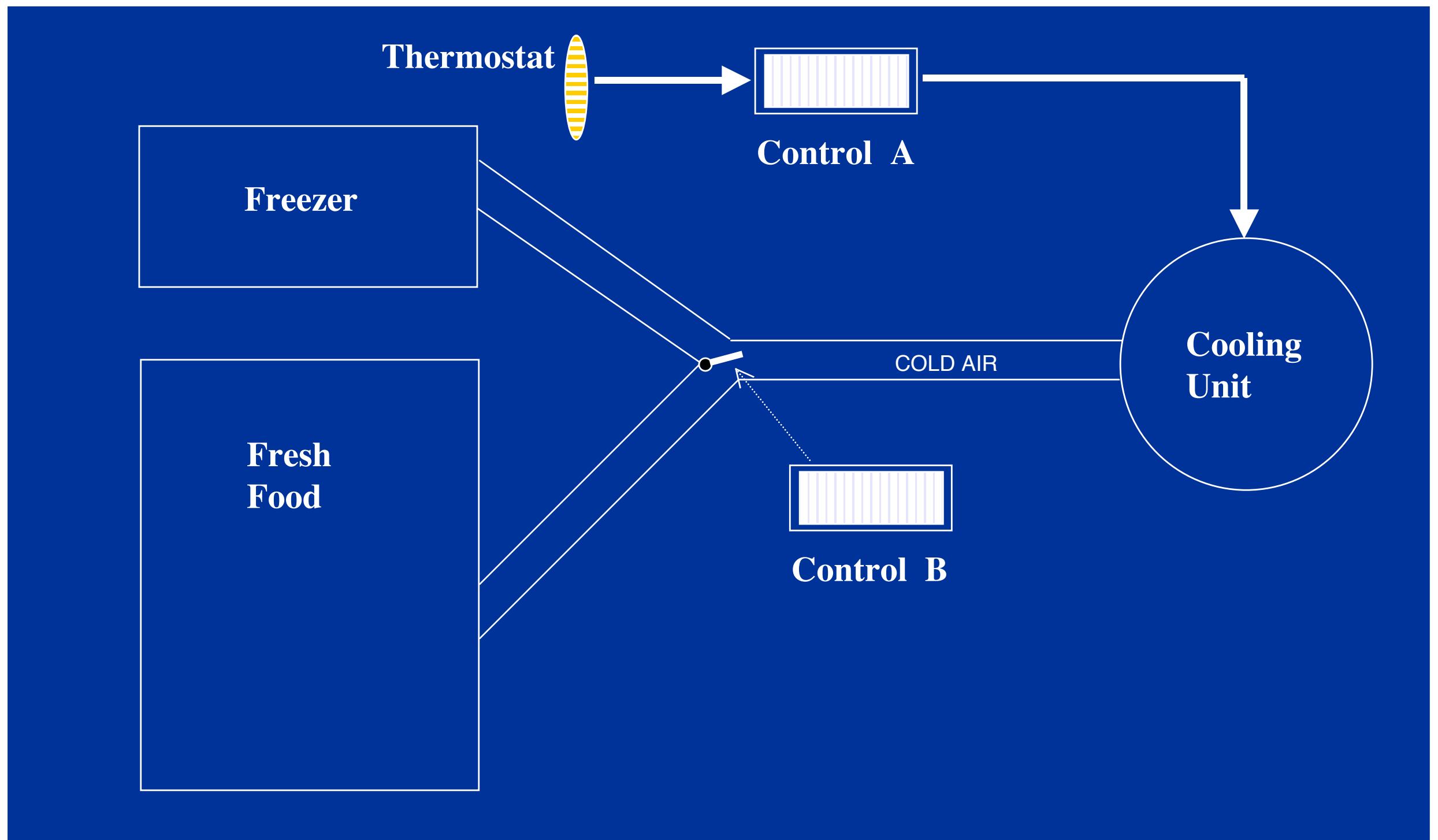
Mental Models



You'd think ...



The way it really works ...

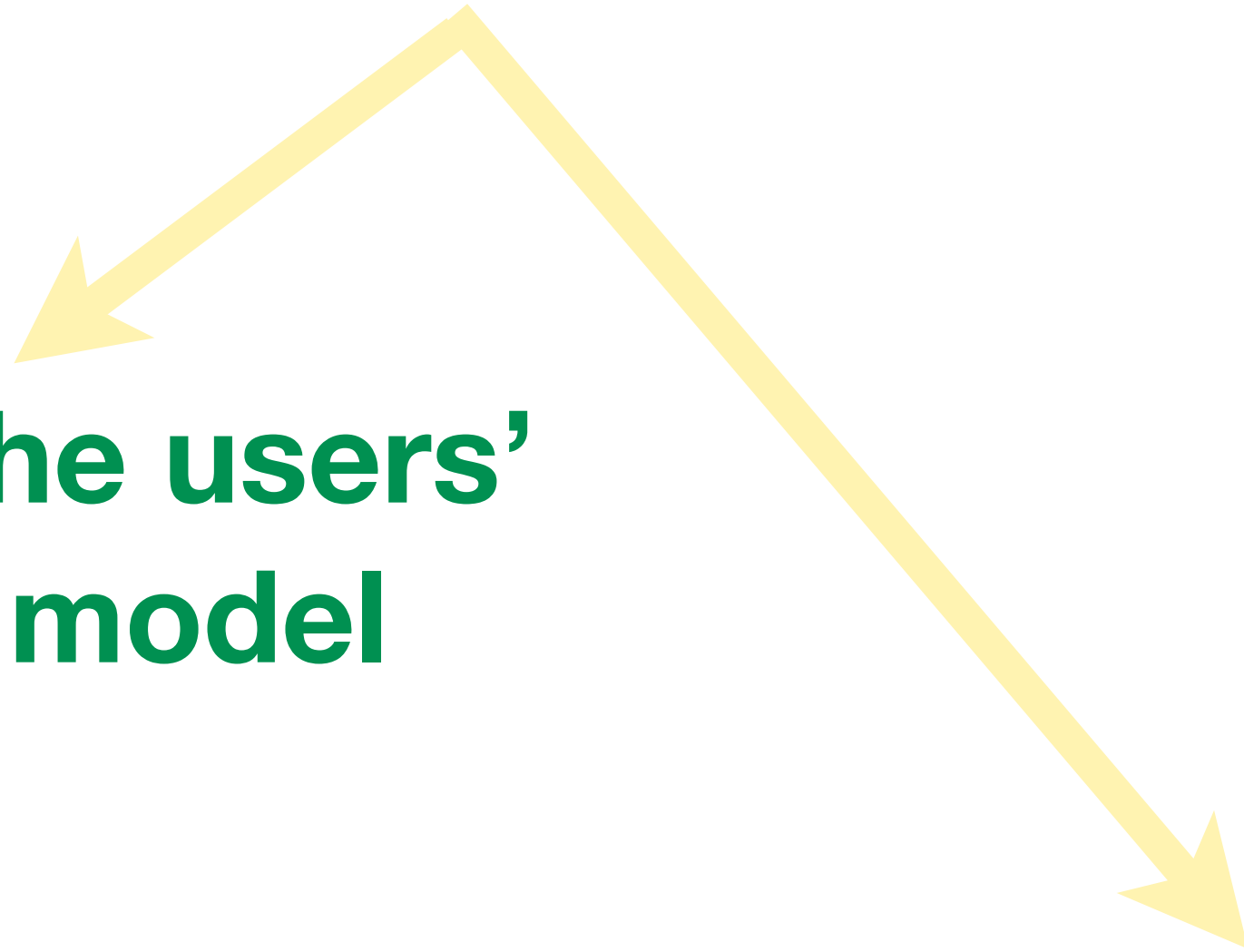


Correct Mental Models



Correct User Behaviors

Two Choices



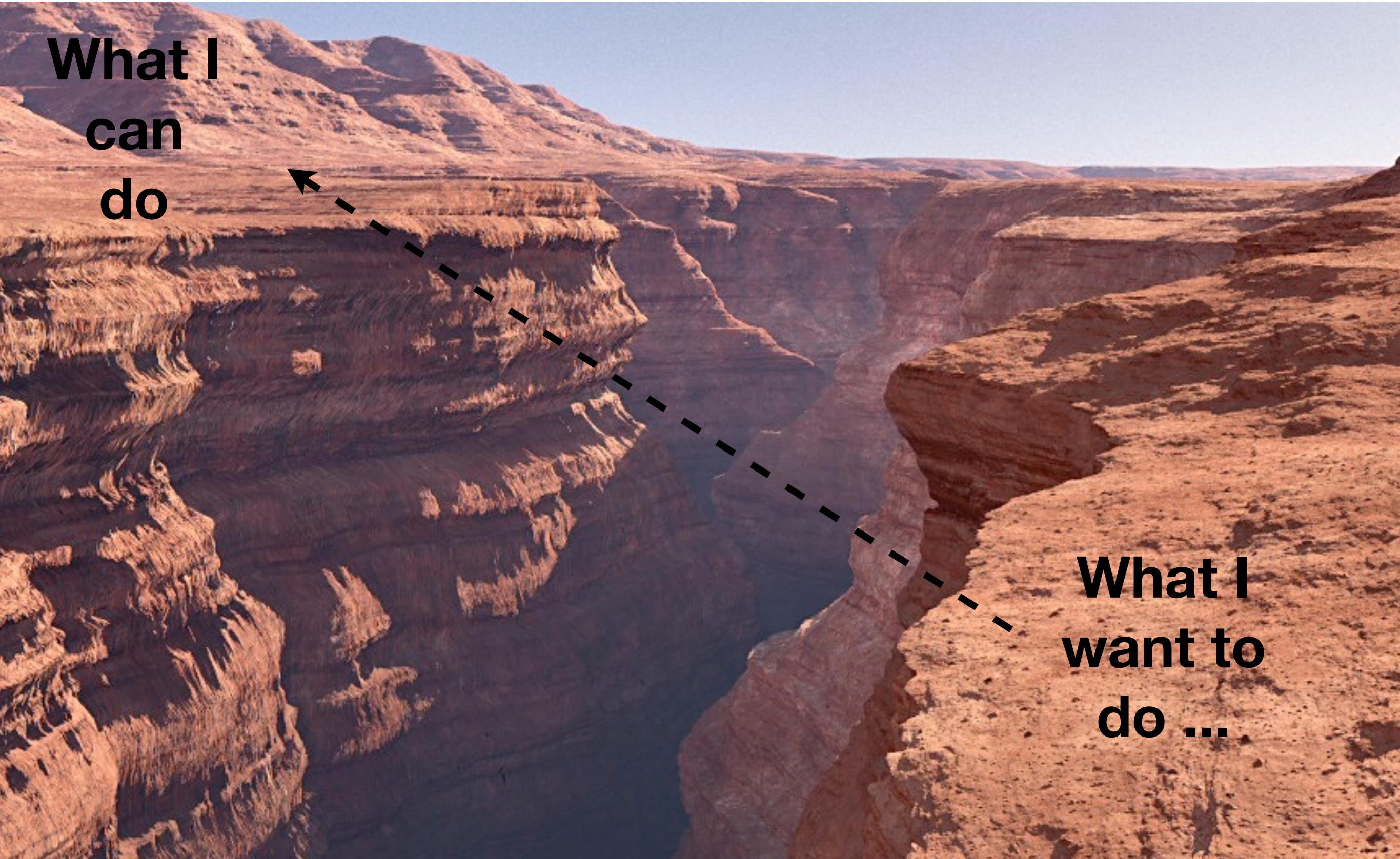
**Support the users'
mental model**

**Train to a new
mental model**

The “Gulf of Execution”

**What I
can
do**

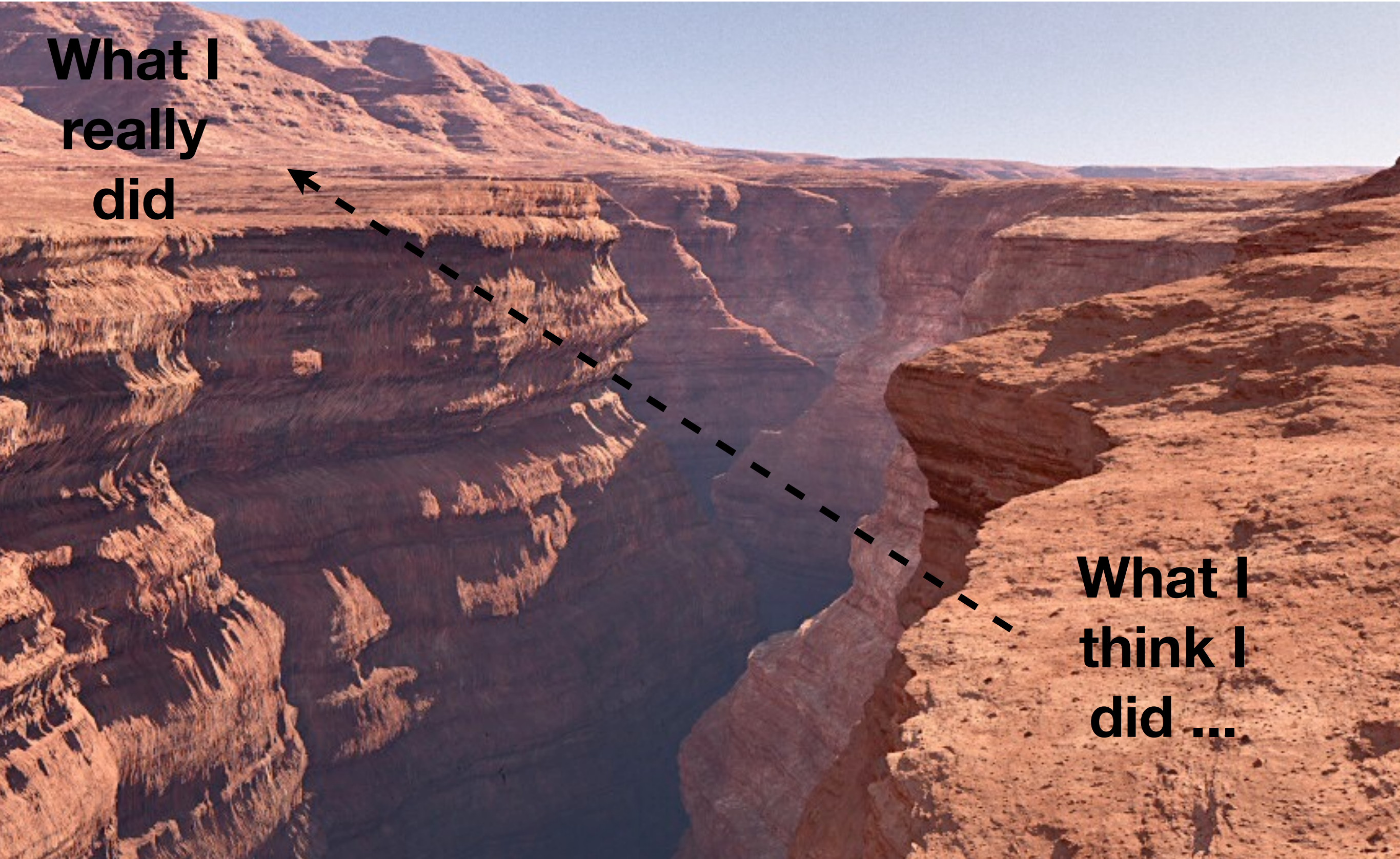
**What I
want to
do ...**



The “Gulf of Evaluation”

**What I
really
did**

**What I
think I
did ...**

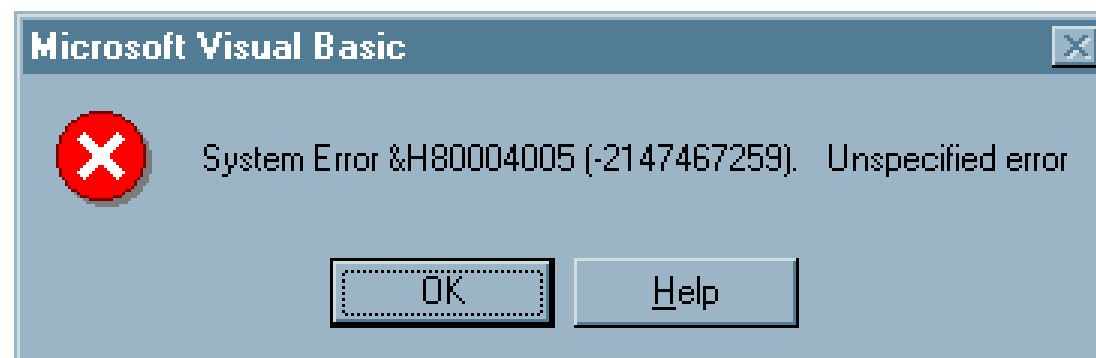
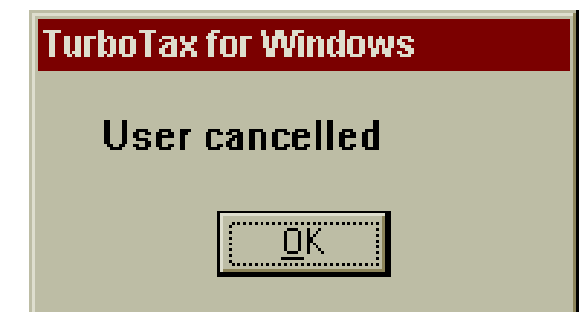
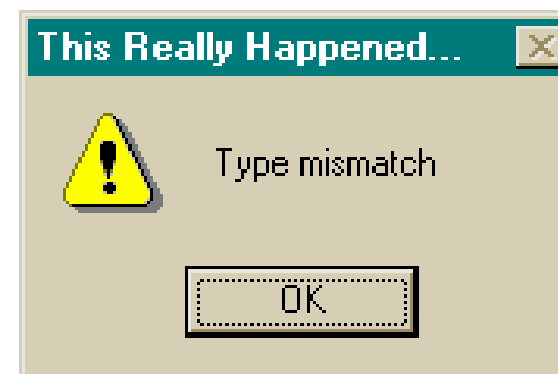
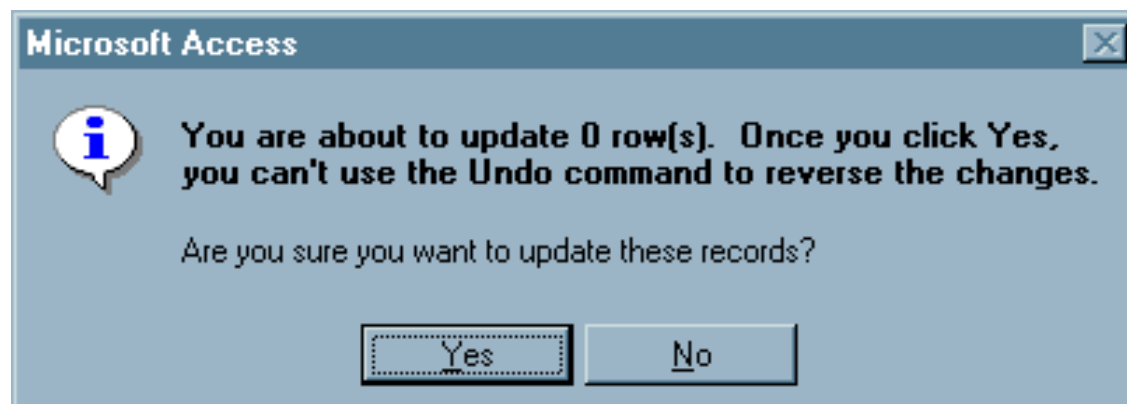
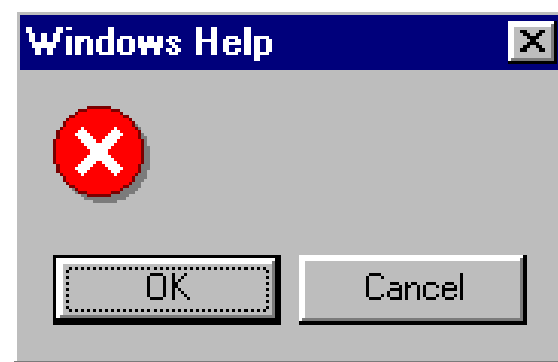


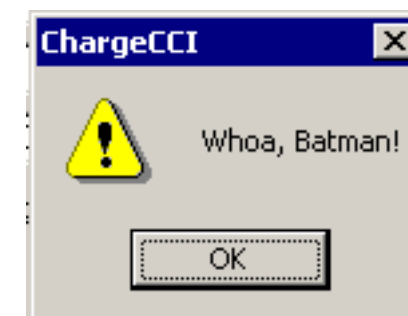
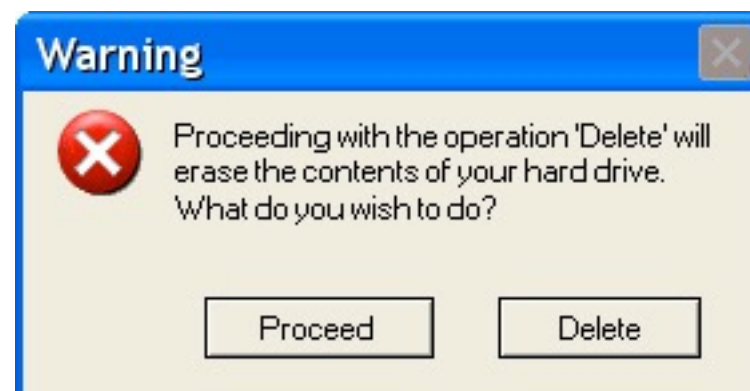
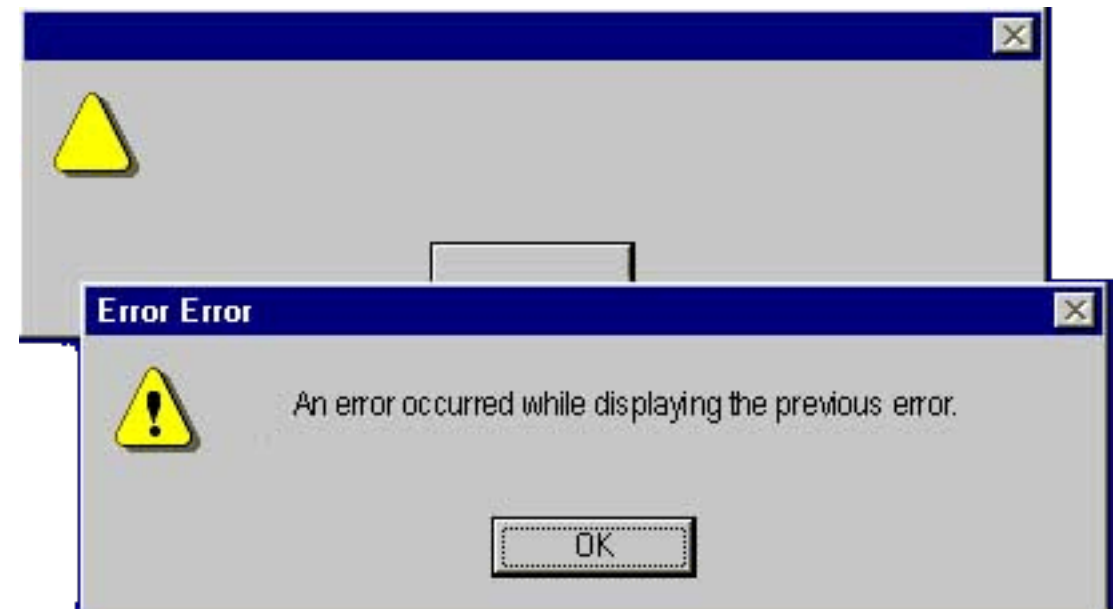
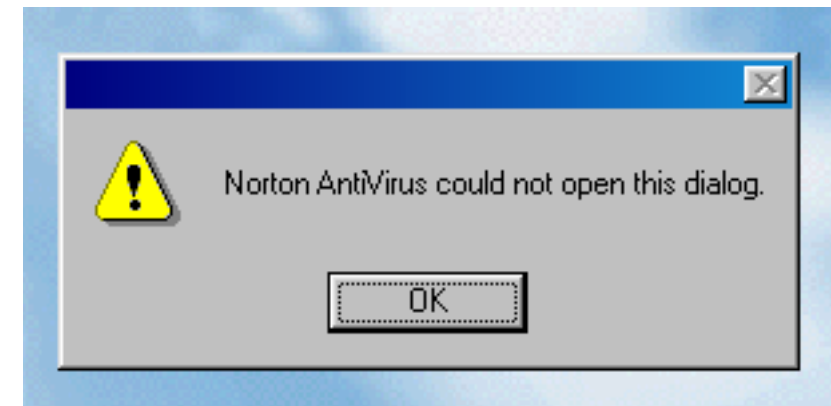
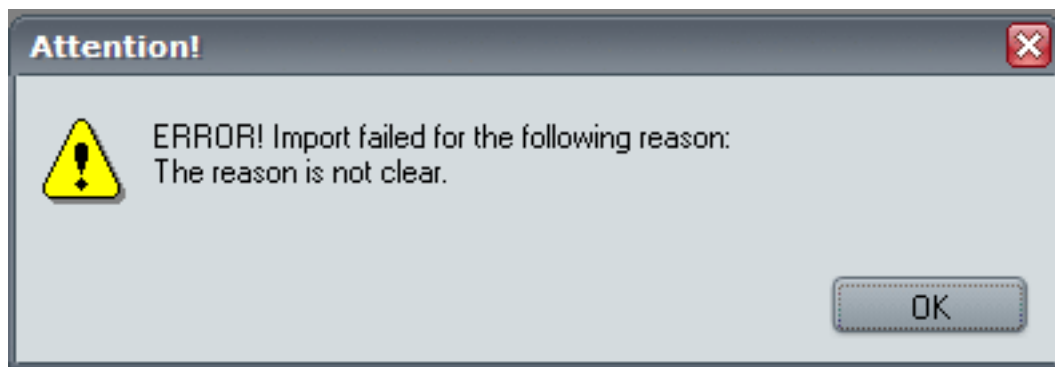
One “key” to narrowing these gulfs ...



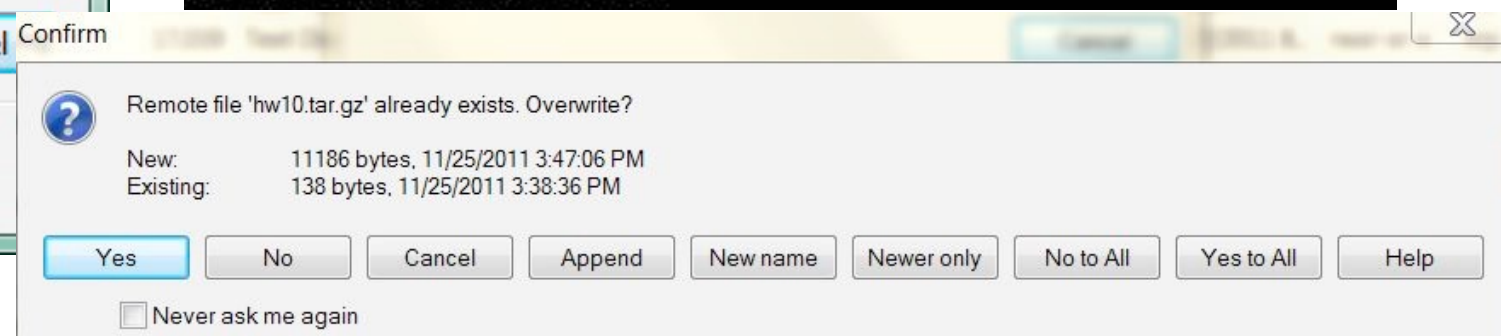
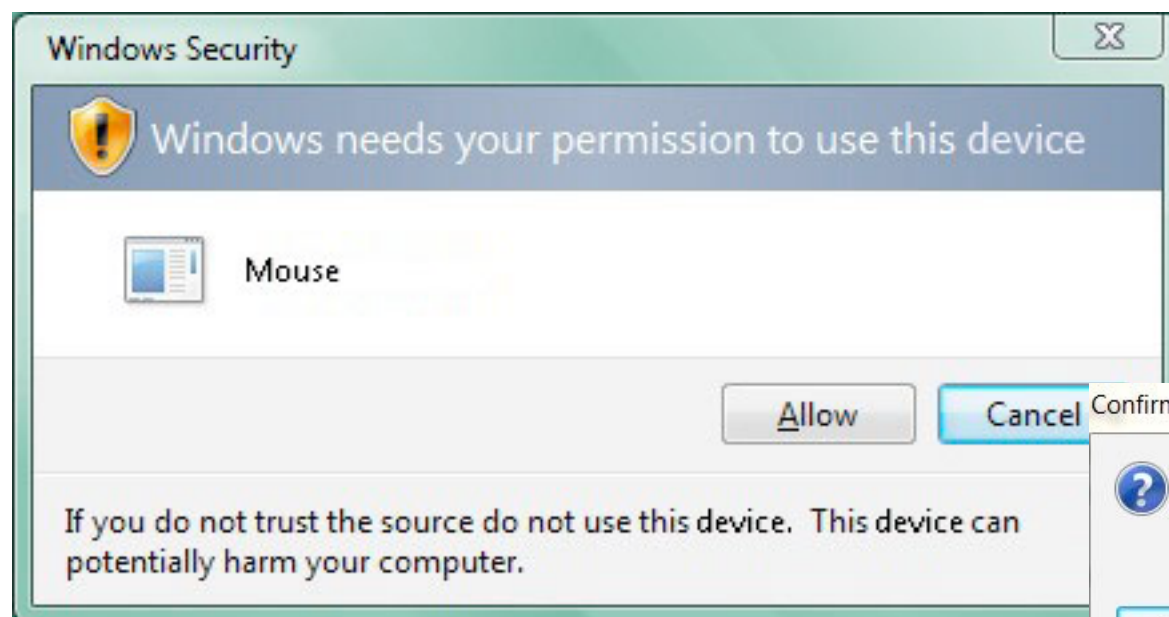
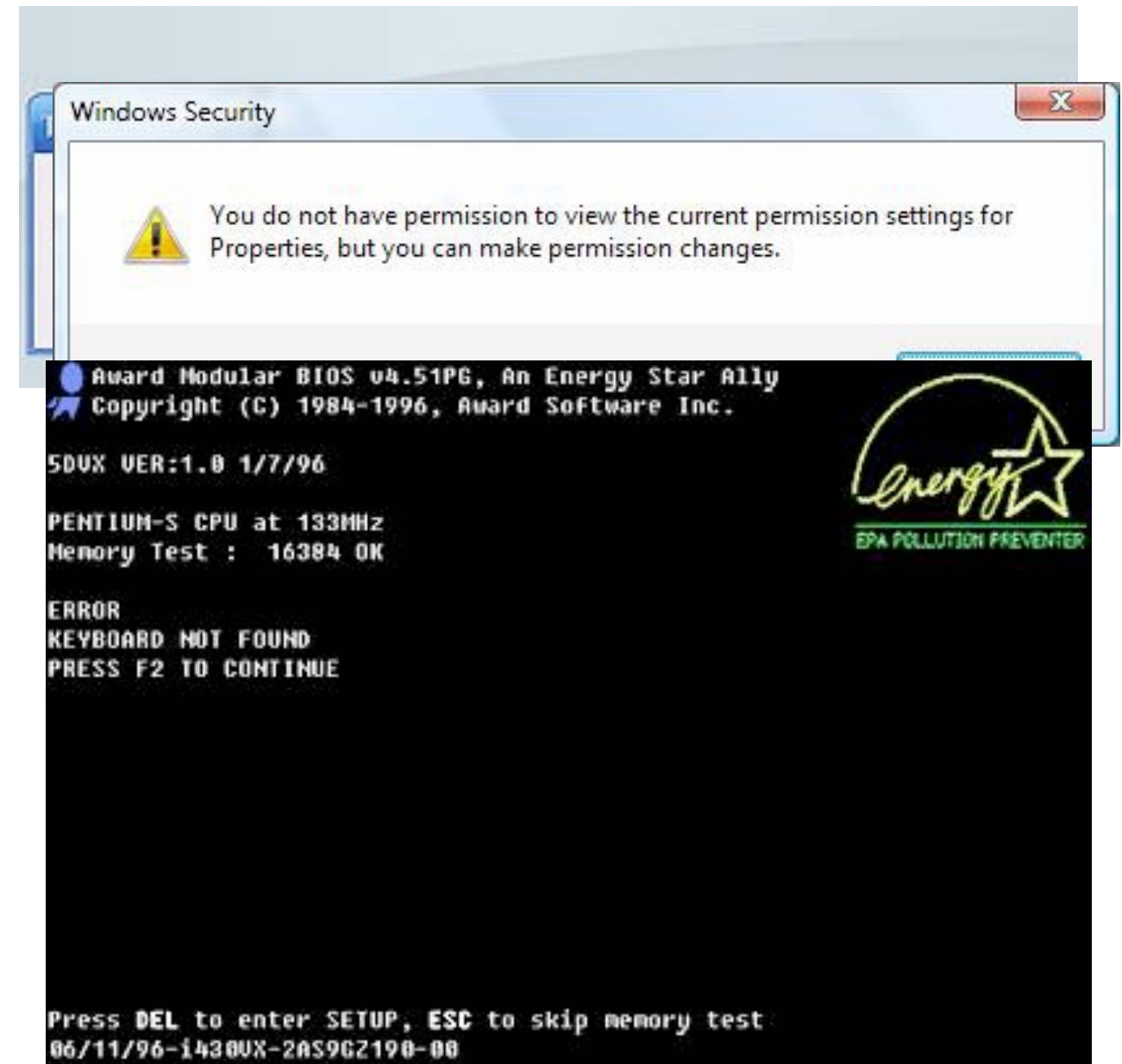
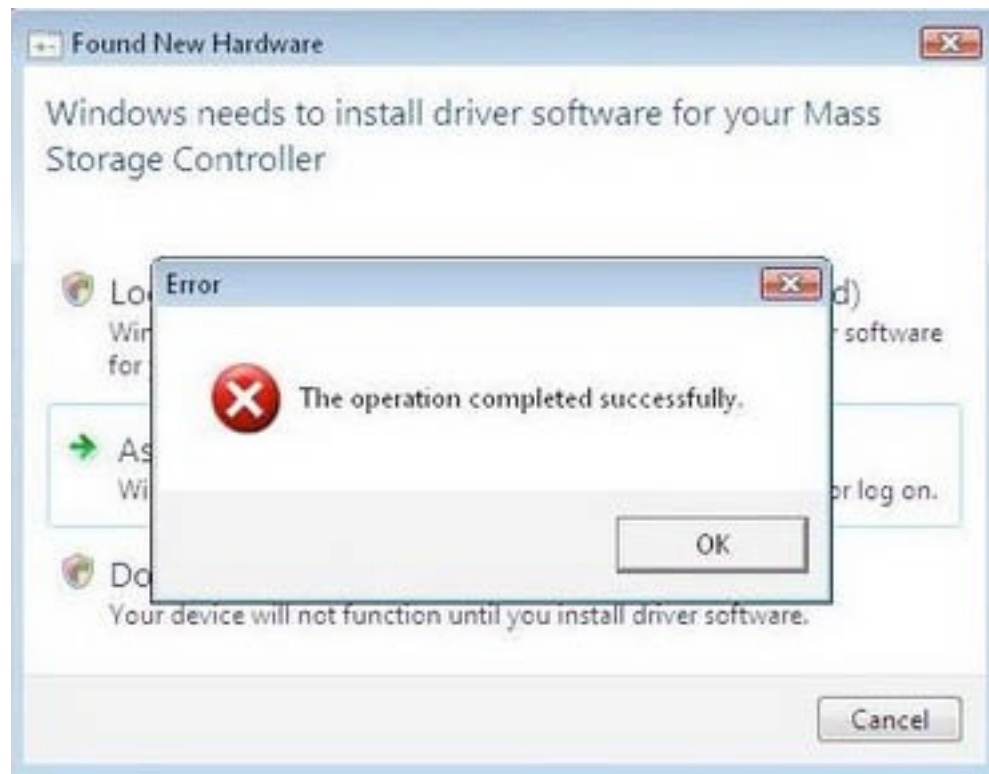
... is providing useful feedback

Error Messages in Error





More Errors





Toolbox

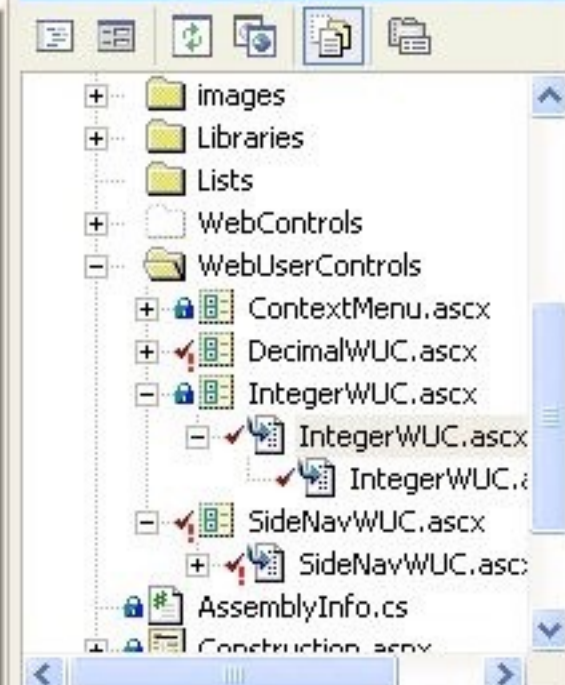
HTML
Clipboard Ring
General
Pointer

WebUserControls\SideNavWUC.ascx WebUserControl...NavWUC.ascx.cs WebUserContr...tegerWUC.ascx

```
1 <%@ Control Language="c#" AutoEventWireup="false" Codebehind="IntegerWUC.ascx.cs" Inherits="WebUserControls.IntegerWUC" %>
2 <DIV style="WIDTH: 489px; POSITION: relative; HEIGHT: 64px" ms_posi
3 <asp:Label id="lblName" style="Z-INDEX: 101; LEFT: 8px; POSITIO
4     CssClass="title"></asp:Label>
5 <asp:TextBox id="tbInput" style="Z-INDEX: 102; LEFT: 112px; POS
6     Visible="False"></asp:TextBox>
7 <asp:RequiredFieldValidator id="rfv" style="Z-INDEX: 103; LEFT:
8     CssClass="error" ErrorMessage="Please provide input." Contr
9 <asp:Label id="lblContents" style="Z-INDEX: 104; LEFT: 112px; P
10    runat="server" CssClass="body" Visible="False"></asp:Label>
11 <asp:RangeValidator id="rv" style="Z-INDEX: 105; LEFT: 296px; P
12    runat="server" ControlToValidate="tbInput" ErrorMessage="Pl
13    Type="Int" MinimumValue="65536"></asp:
14 <asp:RegularExpressionValidator id="rev" style="Z-INDEX: 106; L
15    CssClass="error" ErrorMessage="Please provide valid input."
16    BackColor="Red"></asp:RegularExpressionValidator>
17
```



Solution Explorer - Ensemble



Solution Explorer Class View

Properties

IntegerWUC.ascx.cs File Properties



Advanced

Build Action	Compile
Custom Tool	
Custom Tool Name	

Misc

File Name	IntegerWUC.ascx.cs
Full Path	C:\Documents and Settings\...

Misc

Properties Dynamic Help

Breakpoints



Name Condition Hit Count

Task List Output Pending Checkins Find Symbol Results Breakpoints

My Computer

My Documents

Recycle Bin

Internet Explorer

Microsoft Office Excel

Microsoft Office Publisher

Microsoft Office Word

Microsoft Office Outlook

start

2:12 PM

Copying...

Copying 'agreeen_quickbooks.rar'
To 'C:\Documents and Settings\ruth\Desktop'

13 Minutes Remaining

Cancel

Error Copying File or Folder

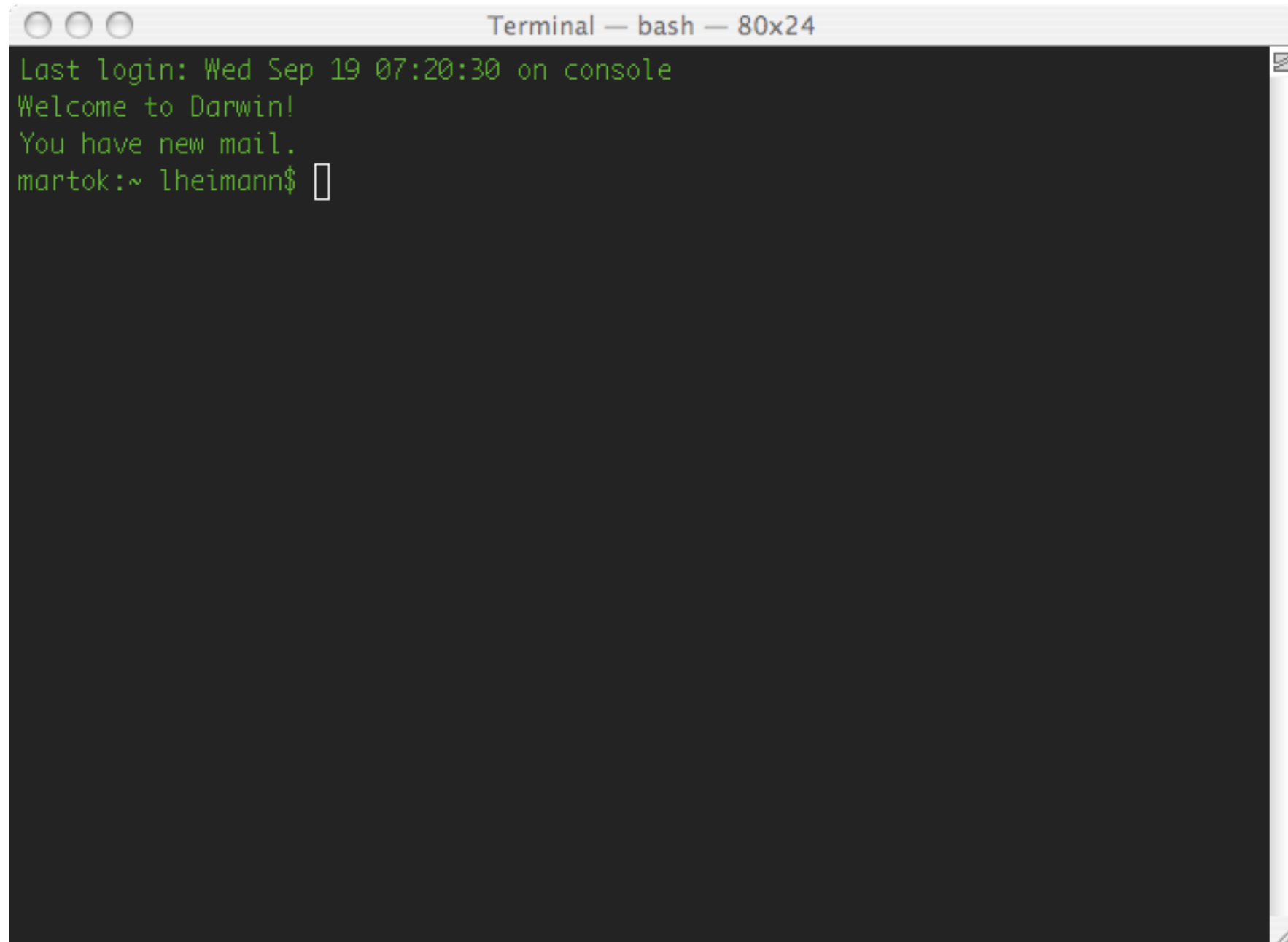
A system call that should never fail has failed.

OK

Other kinds of feedback

- what events need feedback?
- different means of providing the feedback

Where is system knowledge kept?

A screenshot of a macOS Terminal window. The title bar at the top reads "Terminal — bash — 80x24". The terminal content, displayed in green text on a dark background, shows a successful login sequence: "Last login: Wed Sep 19 07:20:30 on console", "Welcome to Darwin!", "You have new mail.", and the prompt "martok:~ lheimann\$" followed by a cursor. The window has standard macOS window controls (red, yellow, green buttons) in the top-left corner and a scroll bar on the right side.

```
Terminal — bash — 80x24
Last login: Wed Sep 19 07:20:30 on console
Welcome to Darwin!
You have new mail.
martok:~ lheimann$
```

Knowledge: In system vs. in head

In System

In Head

Retrievability

whenever visible or audible

requires memory search
or reminding

Learning

not required—interpretation
substitutes for learning

required and can
be considerable

Efficiency

slowed by need to find and
interpret external information

can be very efficient

Aesthetics

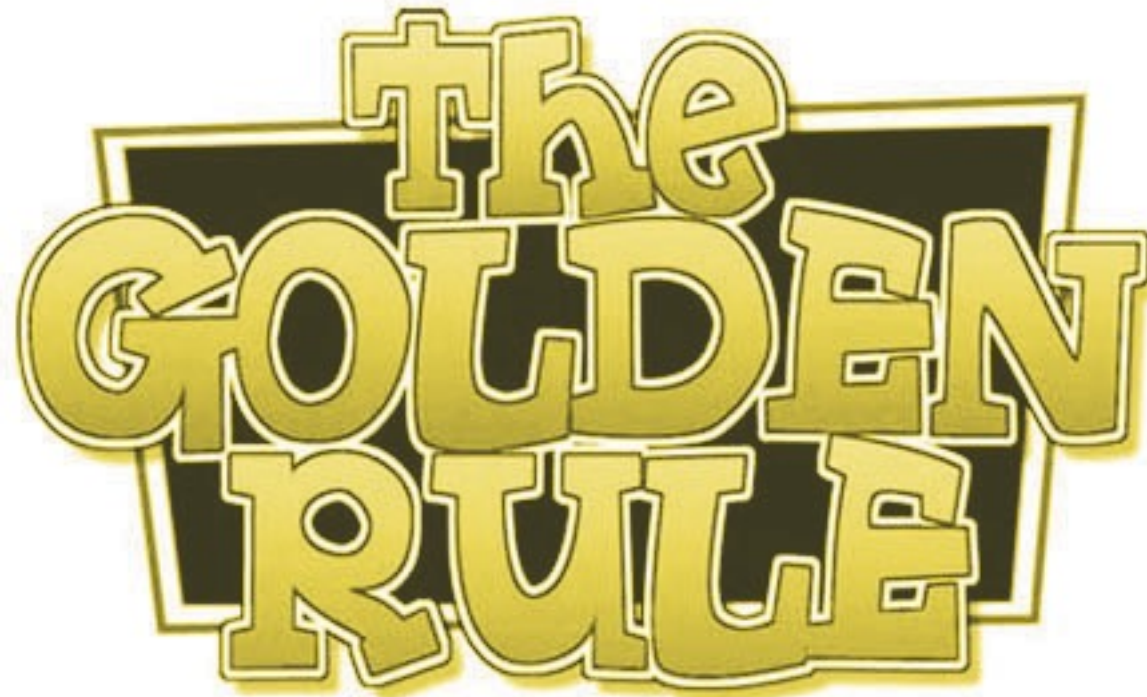
maintaining lots of information
can lead to cluttered designs

avoid cluttered look; simplicity
can be aesthetically pleasing

Ease of Use (1st time)

high

low

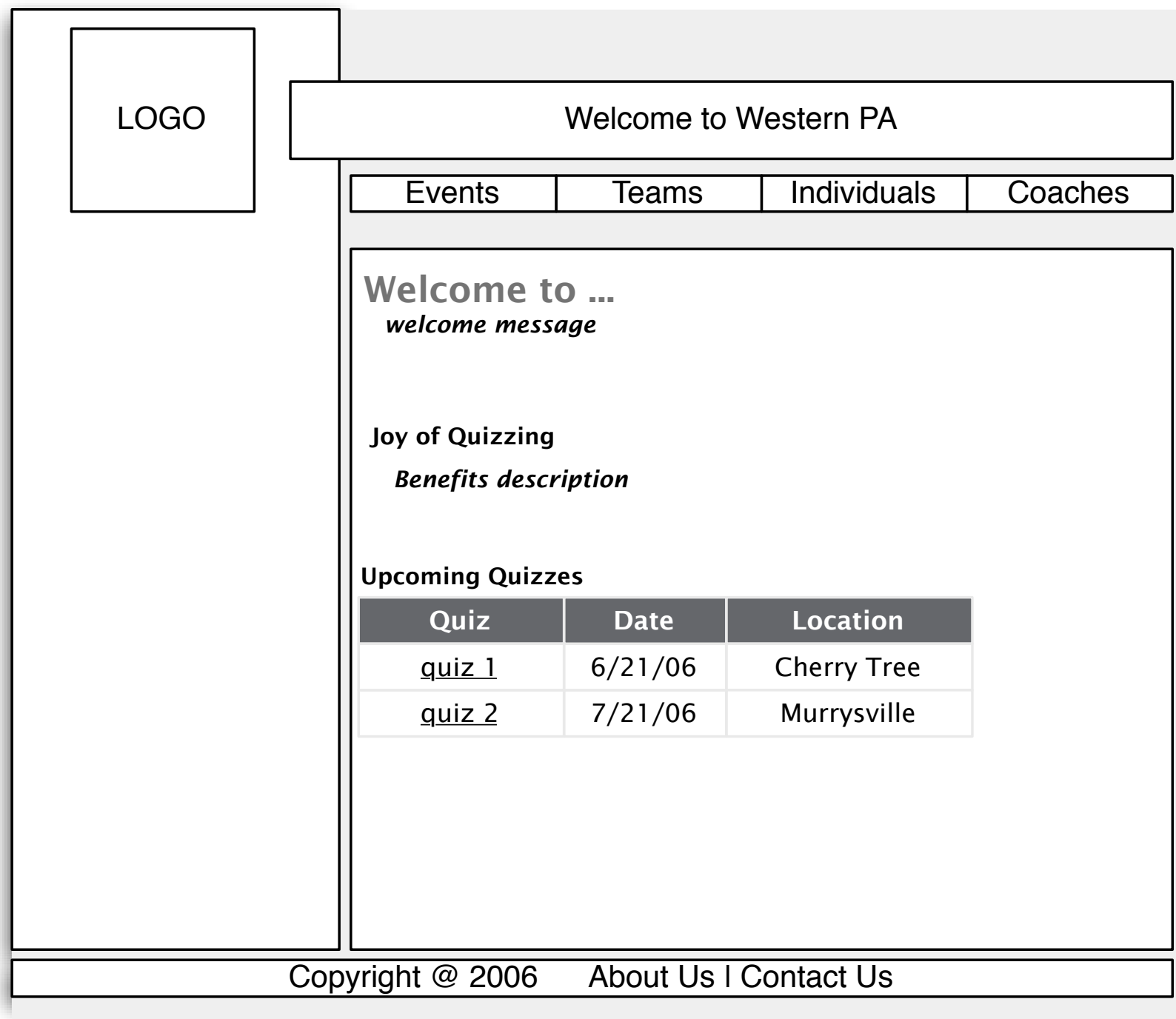


Keep Users In Control

Reduce Cognitive Load

Keep Interface Consistent

Making wireframes



- [Quiz #](#) is a link to View Quiz Details.
- What to do with space on the left.

LOGO

Welcome to Western PA

Events

Teams

Individuals

Coaches

Home > Events

Events

Quiz	Date	Location
<u>Quiz 1</u>	5/15/06	ACAC
<u>Quiz 2</u>	6/21/06	Cherry Tree
<u>Quiz 3</u>	7/21/06	Murrysville

[Export to Excel](#)

Copyright @ 2006 About Us | Contact Us

- Quiz # is a link to View Quiz Details

LOGO

Welcome to Western PA

Events

Teams

Individuals

Coaches

Home > Events > Quiz Details

Quiz Details

Date: 6/2/2006

Location: 5032 Forbes AVE,
Pittsburgh, PA 15213

Senior Division, Top 5 Teams

Name	Score
<u>ACAC1</u>	119
<u>ACAC3</u>	110

[Senior Team Standings](#)
[Export to Excel](#)

Senior Division, Top 5 Individuals

Name	Score
<u>Griffin</u>	540
<u>Joanna</u>	530

[Senior Individual Standings](#)
[Export to Excel](#)

Junior Division, Top 5 Teams

Name	Score
<u>ACAC2</u>	115
<u>CherryTree</u>	106

[Junior Team Standings](#)
[Export to Excel](#)

Junior Division, Top 5 Individuals

Name	Score
<u>Nathan</u>	420
<u>Gabe</u>	410

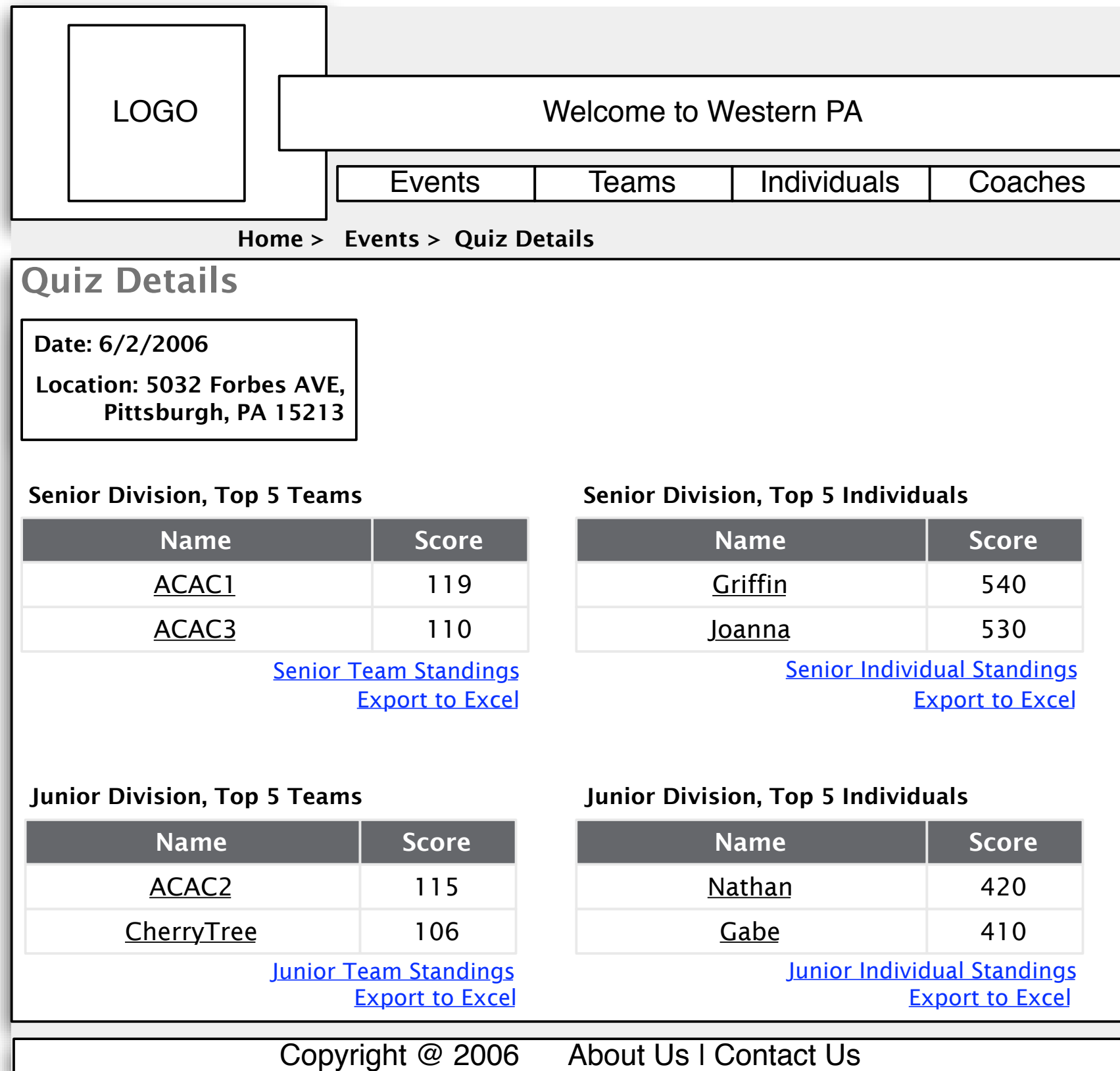
[Junior Individual Standings](#)
[Export to Excel](#)

Copyright @ 2006 About Us | Contact Us

- Team # and Player # are links to View Team Details and View Individual Details, respectively.
- If quiz has not been completed, a Google Map will be shown underneath the date/location box.

Thoughts on wireframes

- No graphics, color
- All pages
- Putting in storyboards



- Team # and Player # are links to View Team Details and View Individual Details, respectively.
- If quiz has not been completed, a Google Map will be shown underneath the date/location box.



information systems

application design and development

username

password

[Forgot password?](#)

[home](#) [schedule](#) [course policies](#) [general policies](#) [projects](#) [code library](#)

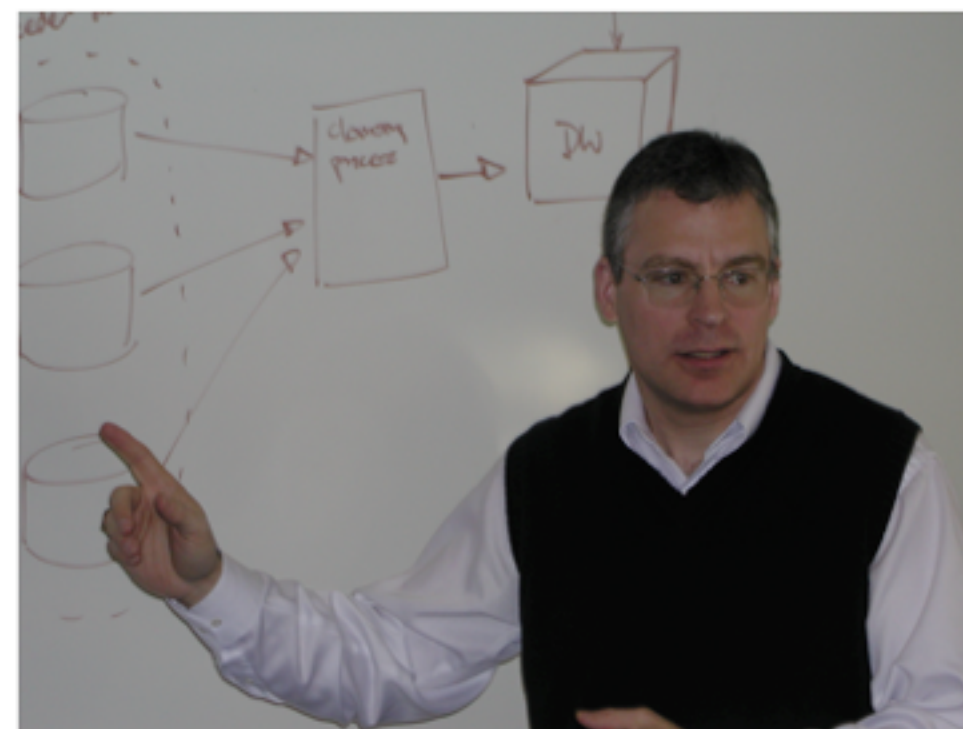
Application Design & Development

Carnegie Mellon University
Fall 2007 - Professor Heimann

According to the official description, this course helps students understand the design process and provides them with the concepts needed to design and develop effective, high quality software applications. Topics include user-centered design and development; data storage and manipulation; structured query languages; and the development of web-based applications. Attention to process, quality, personal productivity will be recurring themes throughout the course. Students will practice the skills they learn by implementing an ecommerce site through a series of structures assignments.

Students should note that this course is *not* a programming class designed to make them fluent in one specific language. The goal of this course is to help students develop competency with several key technologies used in web development and e-commerce and to provide them with the principles needed to make effective use of these technologies. To further prepare students for a lifetime of learning, we will be teaching the actual programming segments of the class using the industry norm of "just-in-time" learning. We will give students an overview of the keys points of the programming language as needed for each upcoming project, but expect students to follow up on these presentations with reading and self-directed study to fill in any gaps in learning. Additional material on personal software processes should enable students to be effective learners and compete in an industry where life-time learning is the norm.

Links at the top of the page should direct students to relevant course materials (schedule, course and program policies, and project assignments) that are being used for the Fall 2007 semester. The general policies link are for those adopted by the IS Program; all will be adhered to in this course. Information on this site is only relevant for the Fall 2007 semester only.

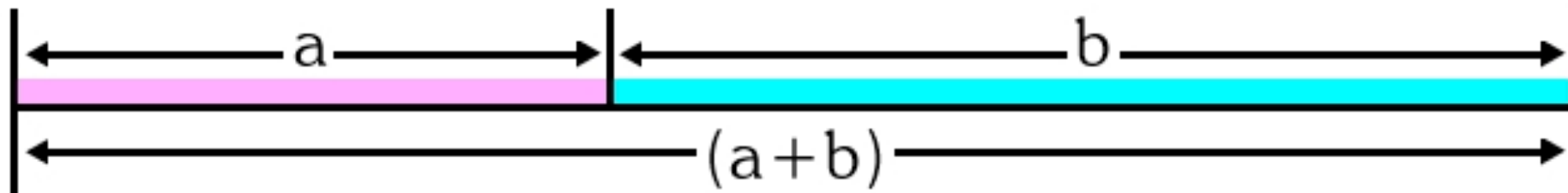


Carnegie Mellon

[67-272 Home](#) | [Athena](#) | [I.S. Home](#) | [Who Knows?](#)

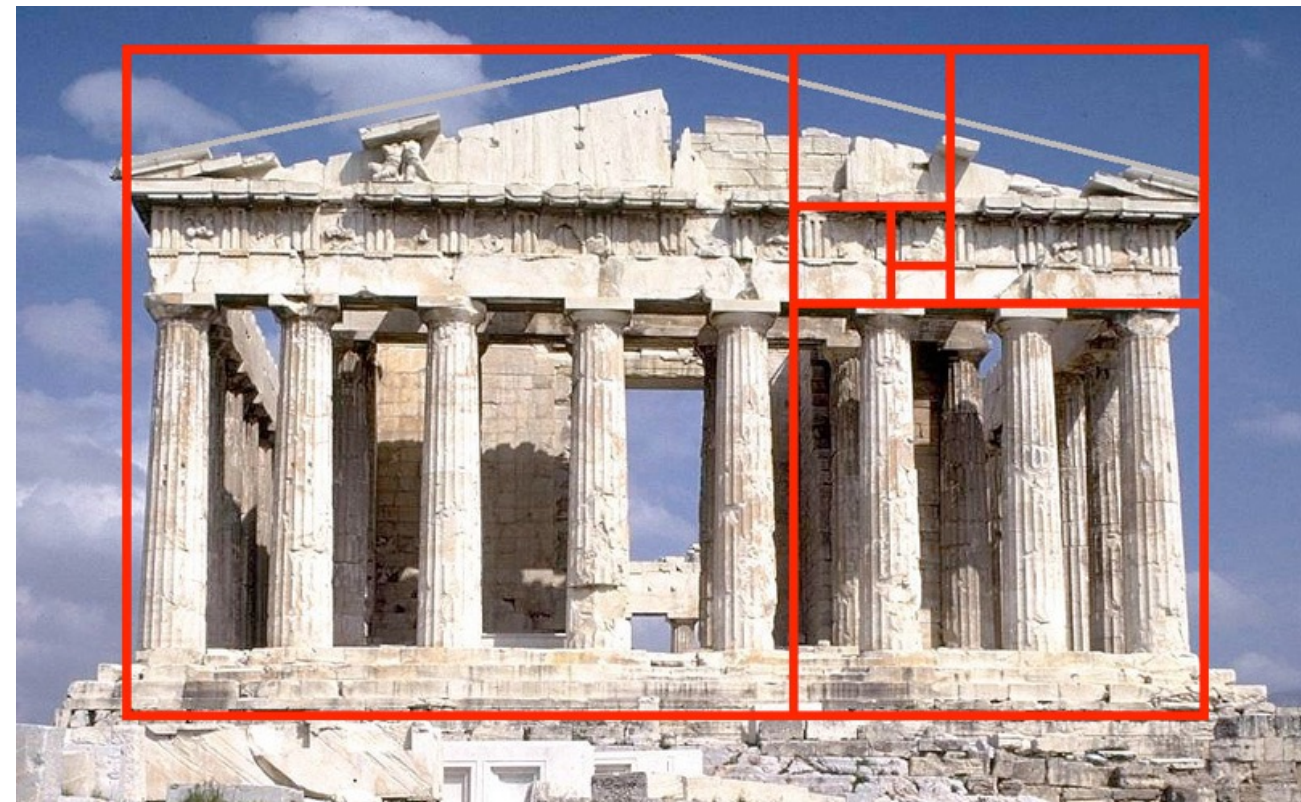
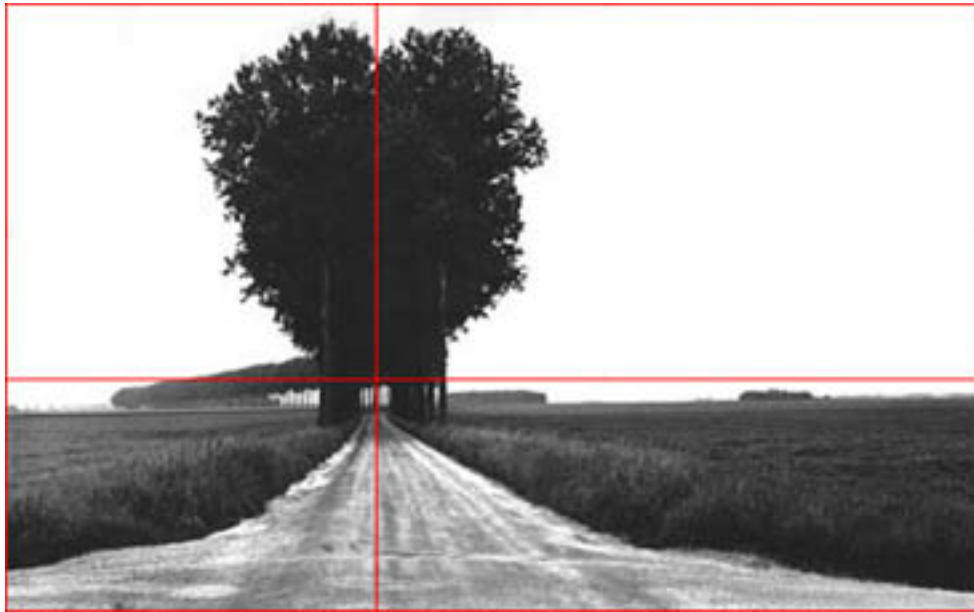
Webmaster: Klingon Code Warrior Copyright 2007 KCW

The Golden Ratio

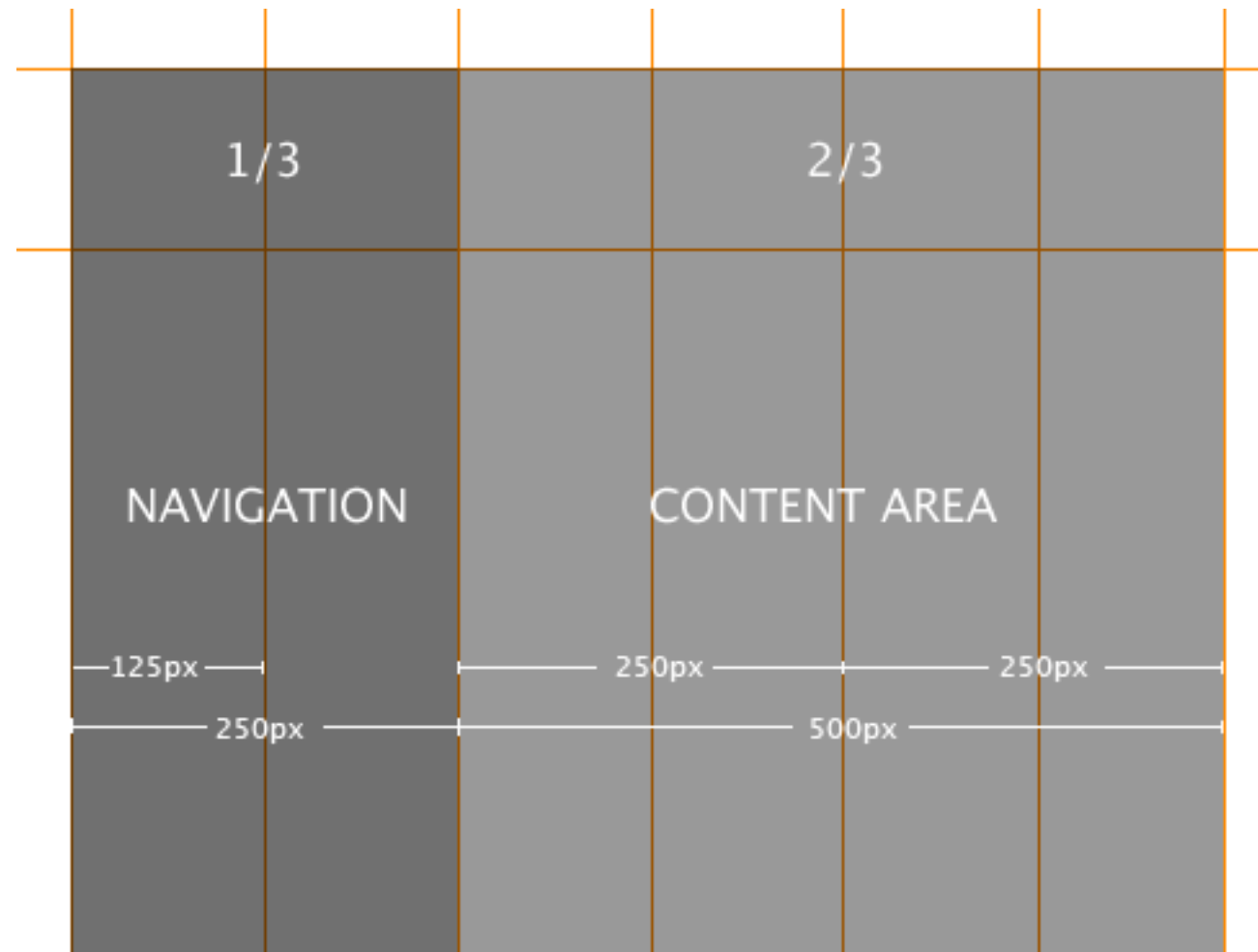


$$\frac{a}{b} = \frac{b}{(a+b)}$$

Golden Ratio: It's everywhere...



Layouts & Grids



Why Rails scaffolding bites...



Basic Color Wheel



Color Schemes



Monochromatic



Split-Complementary



Analogous



Triadic



Complementary



Tetradic
(Double Complementary)

Mint A Fresh Look at your Site



The web is listening to what you have to say. Admiring your design. Talking about your product.

Mint helps you identify where the most interest is being generated and over what.

Find out what's new in

2

What is Mint?

Mint is an extensible web site analytics program. Its interface is an exercise in simplicity. Visits, referrers, popular pages and searches can all be taken in at a glance on Mint's flexible dashboard. [Learn more!](#)

Gimme!

Satisfy your sweet tooth for site stats with Mint. A single site license is an affordable \$30. That's less than the cost of filling 'er up at the local gas station! Purchase Mint with a major credit card or PayPal account. [What are you waiting for?](#)

ONLY
\$30
PER SITE

Little Help?

There are no stupid questions—but some are certainly more frequently asked than others. After passing the [Mint Server Compatibility Suite](#), our [FAQs](#) are the place to start. If you have a real doozy an active community is here to help in the [Mint Forum](#).

The Latest

As sweet as Mint is, there will always be room for improvement—you can find the latest and greatest version of Mint as well as its plugins (which we like to call Pepper) in the [Peppermill](#). Mint is currently at [version 2.1](#), are you up-to-date?



❖ About UF

Administration, Maps, Tours, Facts,
Giving, Jobs, News, Spotlights, ...

❖ Academics

Colleges, Courses, Libraries, ISIS,
Advising, Continuing, Distance, ...

❖ Admissions

Undergrad, Graduate, Transfer,
International, Financial Aid, ...

❖ Campus Life

Arts, Community Service, Athletics,
Housing, Student Involvement, ...

❖ Research

Centers & Institutes, Fellowships,
Programs, Undergrad Research, ...

❖ Services

Goods & Shopping, Health & Safety,
Computing, Transportation, ...



Research News *Breakthroughs & discoveries*

- ❖ Talcum powder stunts growth of lung tumors. [more...](#)
- ❖ Faith-based programs for kids can work without legal controversies. [more...](#)

InsideUF *Your campus news source*

- ❖ State Department awards UF first Study of U.S. program grant in journalism education. [more...](#)
- ❖ UF's Department of Pediatrics and Rinker School of Building Construction receive \$2 million gift. [more...](#)

[Video/Photos](#)[Spotlights](#)[Calendar](#)[Web Site Listing](#)[Directory](#)[Campus Map](#)[MyUFL](#)[WebMail](#)[ISIS](#)[Ask UF \(FAQ\)](#)[❖ Students](#)[❖ Faculty & Staff](#)[❖ Alumni, Donors & Friends](#)[❖ Parents, Patients & Visitors](#)

Typography

Serif Fonts vs. Sans-Serif Fonts

Considering conflicting or contrasting fonts

Issues with FUNKY Fonts

How **many** different fonts can / **use**?