

# Intro To Human-Computer Interaction

# Why Study HCI?

- Software Engineering is about meeting user needs
- If you build the wrong software...oops.
- Q: How do you build software that people can actually use effectively?
- A: Apply principles of HCI; iterate; hire a designer.

# Design

- Design is not "graphic design"
- Design is not primarily about aesthetics (beauty)
- Design is about leveraging principles about humans (psychology) to build interactions people can use

# Your Examples: Bad Design

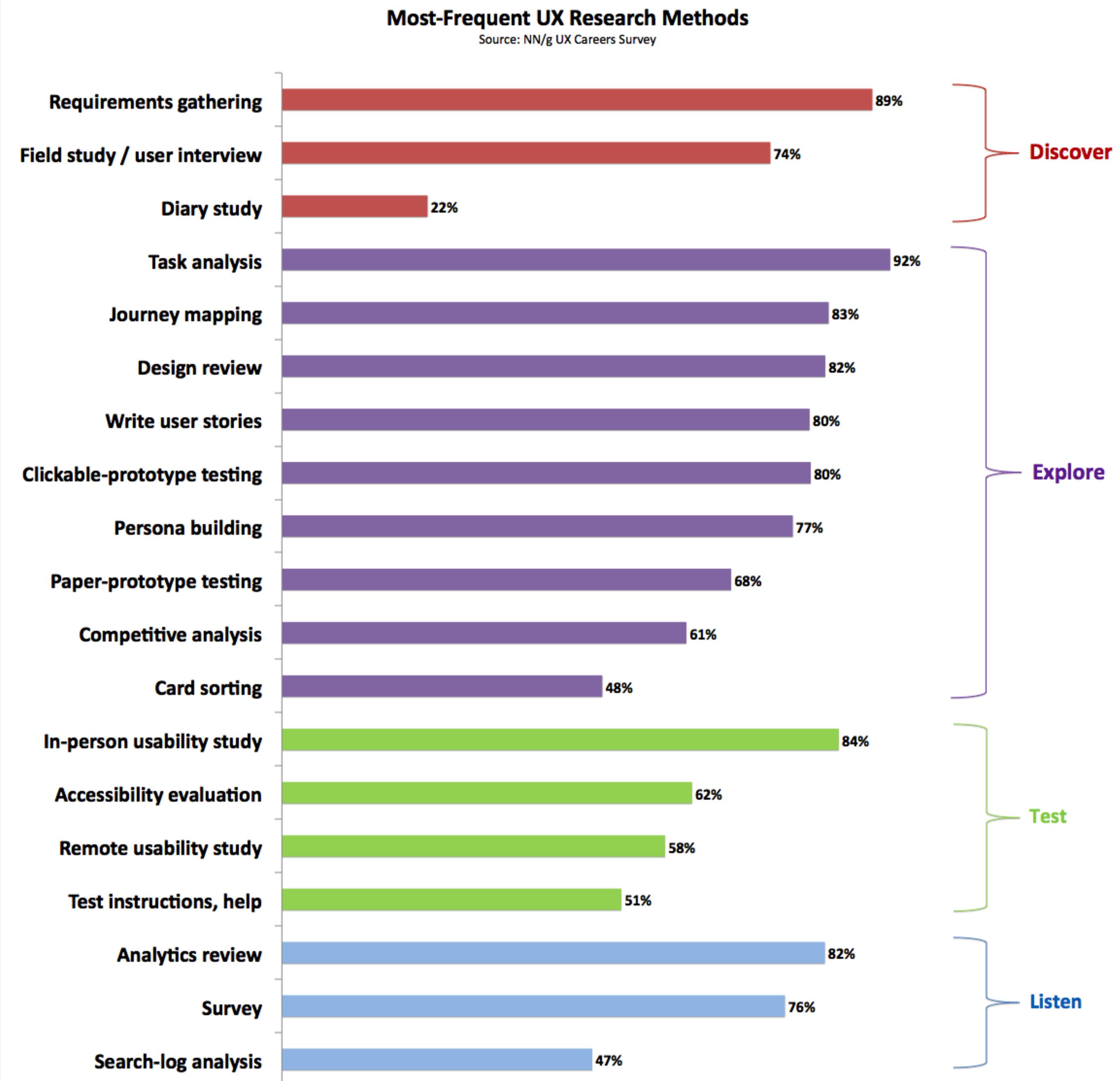
- Think of something that you used that was designed badly
- What about it was designed badly?

# Agenda

- We don't have enough time to teach you interaction design
- But we can give you a taste
- HCl has a whole collection of methods...

# Process

1. Understand your users
2. Create a prototype
3. Evaluate/get feedback
4. Go to step 1



# Contextual Design

- People are experts at their own work
  - But cannot articulate their work practice
- Solution: observe people doing their work
- Build personas to bring users alive

# Personas

- Build empathy
- Help you think like the user
- Not necessarily specific, real people
  - But have enough detail that you can believe...

## Persona 5: Jason, a Regional Director

- Name: Jason Carter
- Occupation: Regional Director
- Demographic: 34 years old, single, lives in San Francisco but travels a lot, has a high-income level.

### Jason's story:

Jason is a regional director who needs to catch flights a lot. He sometimes has to 7-8 times a month for work purposes. His company has assigned Jason to a specific region so that he travels to the same cities and stays at the same hotels for convenience.

### What challenges Jason:

However, Jason finds this situation rather inconvenient if anything. He thinks he wastes the time he doesn't even have, trying to book flights or hotels out of many options. Also, being an introvert, he finds it frustrating that he needs to make phone calls, speak to tons of people or go through numerous websites and waste time.

### What Jason needs:

Jason needs a quick and easy process regarding his travel appointments. A site or a mobile app that would simplify the planning process of his travels would be excellent for him. That way, he would narrow down his options in just a few seconds and clicks and not have to carry his laptop everywhere with him since all he wants is comfort, convenience, and speed.

# Designing a Prototype

- This is a whole course!
- Short version: create storyboards
- Try Figma ([www.figma.com](http://www.figma.com))
  - Free for education (<https://www.figma.com/education/>)

This screenshot shows a user interface for a design tool, likely Figma, displaying three frames: Starting Frame, Intermediate Frame, and End Frame.

The top navigation bar includes icons for file operations (New, Open, Save, etc.), zoom (Zoom In, Zoom Out, Fit View), and other settings (Layers, Assets, Page 1).

The left sidebar lists layers: # Intermediate Frame, # Starting Frame, and # End Frame.

The main canvas displays three frames:

- Starting Frame:** A large frame containing an "API Implementation Environment" section with code input and a response area. It has a blue border and a dimension label "1160 x 636".
- Intermediate Frame:** A smaller frame below the starting frame, also containing an "API Implementation Environment" section with code input and a response area.
- End Frame:** A frame to the right of the starting frame, containing an "API Implementation Environment" section with code input and a response area showing an error message.

The right sidebar contains the following panels:

- Design Prototype Inspect:** Buttons for switching between design, prototype, and inspect modes.
- Frame:** Properties panel for the selected frame:
  - X: -1562, Y: -438
  - W: 1160, H: 636
  - Angle: 0°, Rotation: 0
  - Clip content checkbox (unchecked)
- Auto layout** and **Layout grid** buttons.
- Layer** panel:
  - Pass through (radio button selected)
  - Fill and Stroke buttons
  - Selection colors panel with three entries:
    - Black (000000) at 100%
    - Blue (859CEF) at 100%
    - Dark Blue (B6C1E8) at 100%
  - See all 6 colors link

# Principles

- Lots of visual design principles
- Ways of assessing designs
  - Usability studies
  - "Discount methods": don't need users (users are expensive)

# Rest of Today: Nielsen's 10 Usability Heuristics

- Date from 1994, but still very useful today
  - Timeless? I'm teaching a well-tested approach, anyway
- No need for user tests
- Instead, need an expert evaluator (you?)
- Goal: identify usability problems

# Priorities

- Can't fix every problem
- Instead, consider:
  - *Frequency* with which problem occurs
  - *Impact*: easy or difficult for user to overcome?
  - *Persistence*: one-time, or will users be bothered repeatedly?

# # 1 : Visibility of System Status

- Examples:
  - *you are here* on mall maps
  - Progress indicators (is the system processing?)

Banner at top shows how much more to spend for free delivery

The screenshot shows a website for a snack company. At the top, there's a navigation bar with links for "CHEF PARTNERS", "WHERE TO BUY", "CONTACT US", "FREE SNACKS", and "SIGN IN". A yellow shopping cart icon with the number "1" is also present. A large orange banner across the middle of the page says "Add \$5.01 for free delivery!". Below this, there are several product cards. The first card features "Mocha Almonds Single Serve, 12 pack" for \$24.99, now \$19.99 (SAVE 20%). The second card features "Sriracha Roasted Cashews Single Serve, 12 pack" for \$24.99, now \$19.99 (SAVE 20%). A third card for "Whole Wheat Honey Fig Bars" is shown with a "1 in cart" notification. At the bottom, there are three more product cards: "Pecan Pie Bars", "Almond Joy Bars", and "Chocolate Chip Granola Bars". A large yellow arrow points down from the top banner towards the products.

CHEF PARTNERS WHERE TO BUY

CONTACT US FREE SNACKS SIGN IN

1

Shop by Categories Try a sample Sale Office snacks Gifts

Add \$5.01 for free delivery!

**Mocha Almonds Single Serve, 12 pack**  
\$24.99 \$19.99 (SAVE 20%)

**Sriracha Roasted Cashews Single Serve, 12 pack**  
\$24.99 \$19.99 (SAVE 20%)

**1 in cart**  
Sriracha Roasted Cashews Singl...

**Whole Wheat Honey Fig Bars**  
8 oz  
\$6.99 \$5.99 (SAVE 14%)

**Pecan Pie Bars**

**Almond Joy Bars**

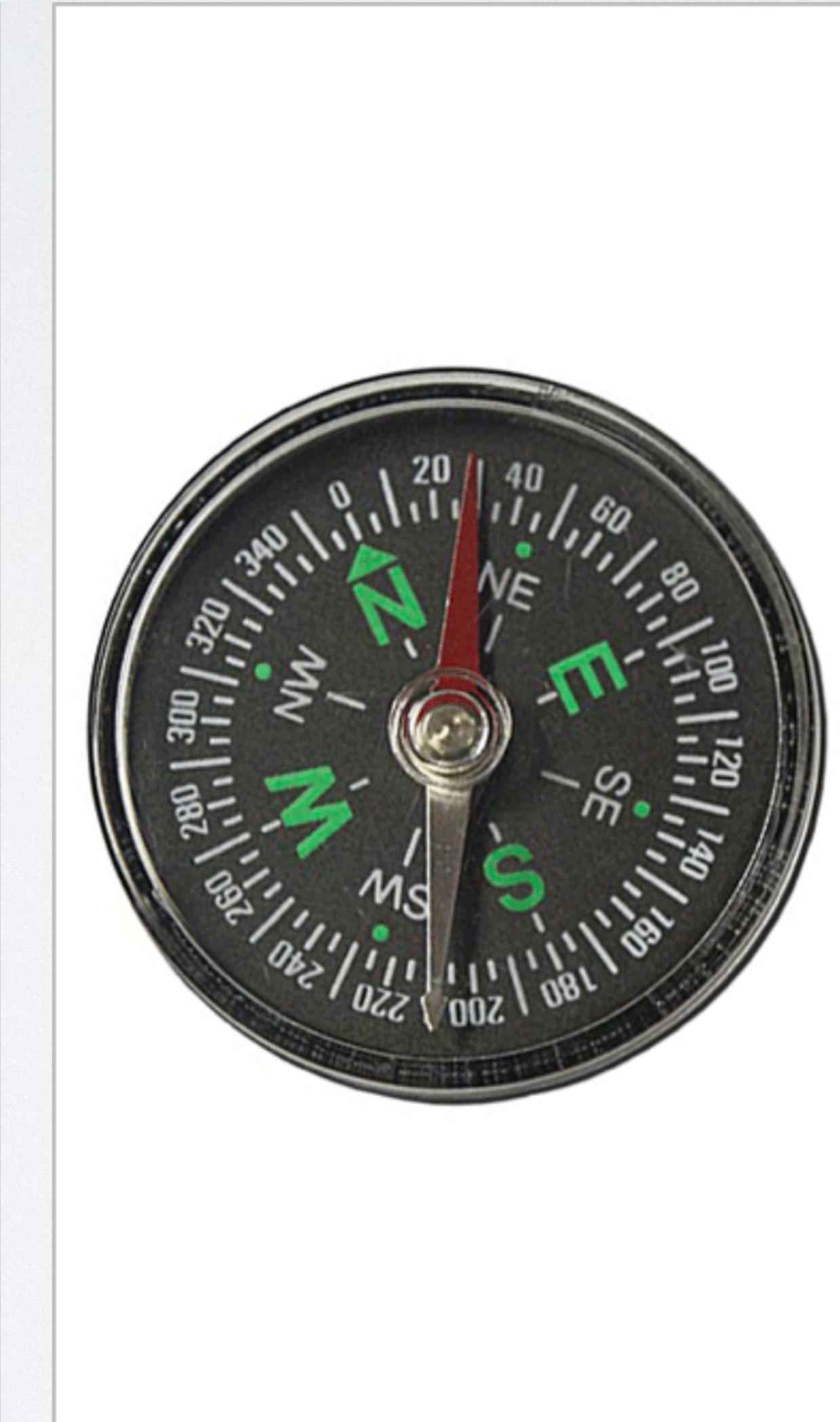
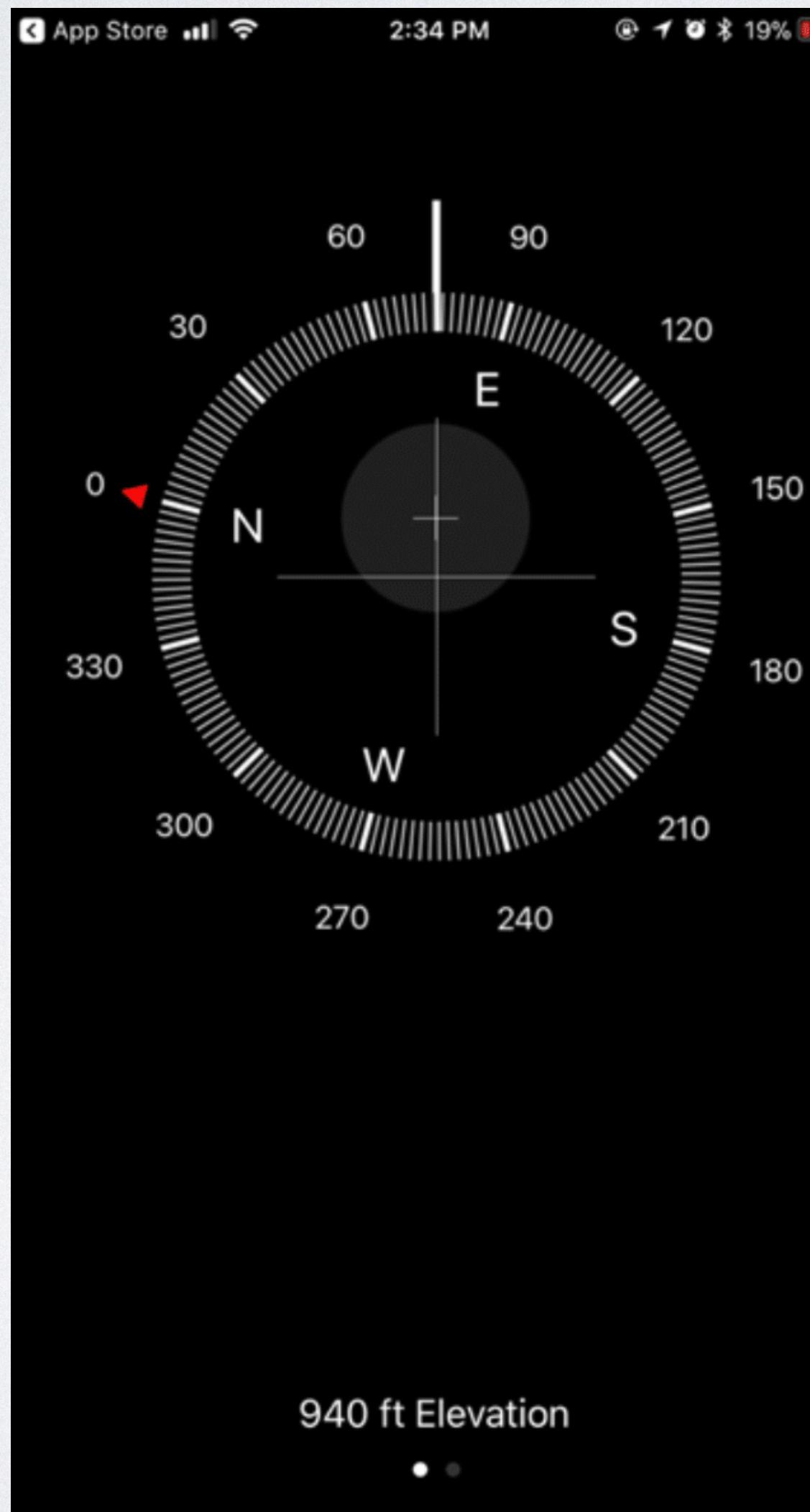
**Chocolate Chip Granola Bars**

# #2: Match Between System and the Real World

- The design should speak the users' language. Use words, phrases, and concepts familiar to the user, rather than internal jargon. Follow real-world conventions, making information appear in a natural and logical order.



# The Compass Looks Like a Compass



suspension doesn't isolate bumpy roads well, and at lower speeds it feels a touch busy on *all* roads," said Mays.

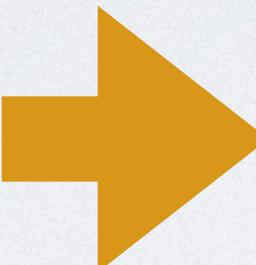
[Research the 2018 Volkswagen Tiguan](#) | [Search Inventory](#) | [Car Seat Check](#) | [Photo Gallery](#)

## How the Competitors Fared in Each Category



Cars.com graphics by Paul Dolan

How is the user supposed to know this means "back"?



## How We Tested

Our weeklong test took place in the Chicago suburbs where judges drove each car on the same loop for back-to-back impressions. Other areas scored included awarding points for as-equipped crash avoidance technologies including forward collision warning with automatic emergency braking, blind spot warning, lane departure warning, lane departure steering and lane-centering steering. Plus, we evaluated and scored how well child-safety seats fit in each SUV.

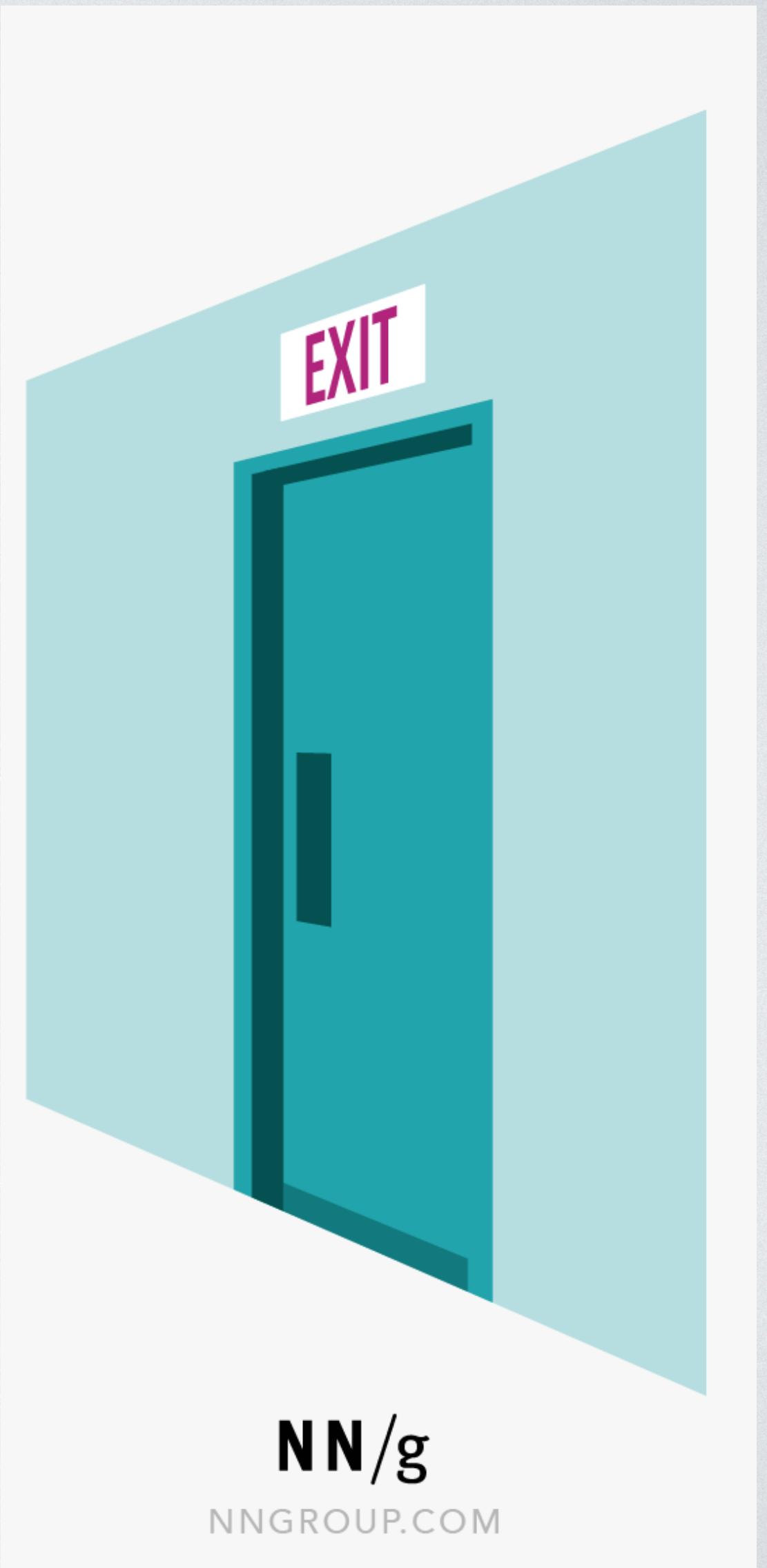
# What Does This Button Do in Word?

- Floppy drives were obsolete in 2001
- This is Word 365, © 2022



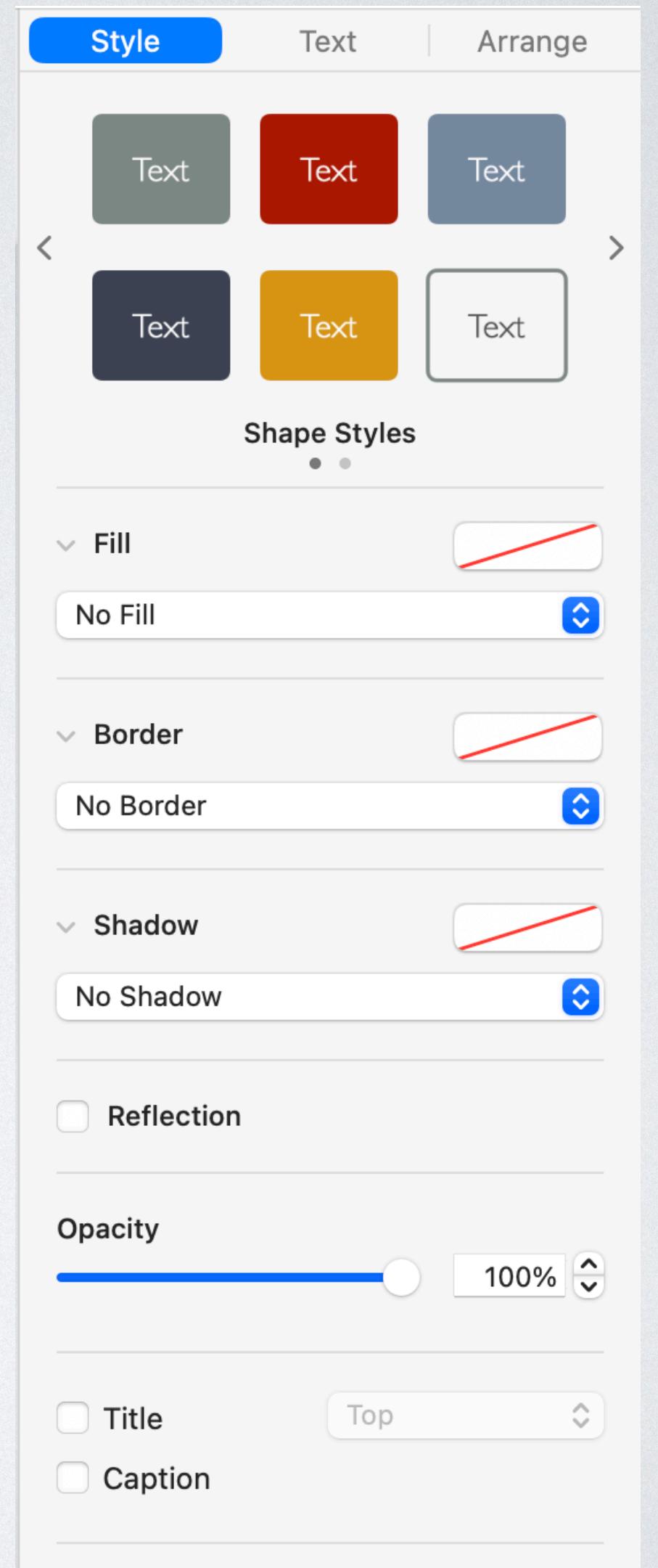
# #3: User Control and Freedom

- Users often perform actions by mistake. They need a clearly marked "emergency exit" to leave the unwanted action without having to go through an extended process.
- Support Undo and Redo.
- Show a clear way to exit the current interaction, like a Cancel button.
- Make sure the exit is clearly labeled and discoverable.



# Let Users Pick the Order

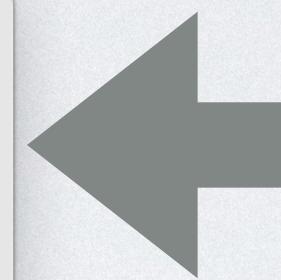
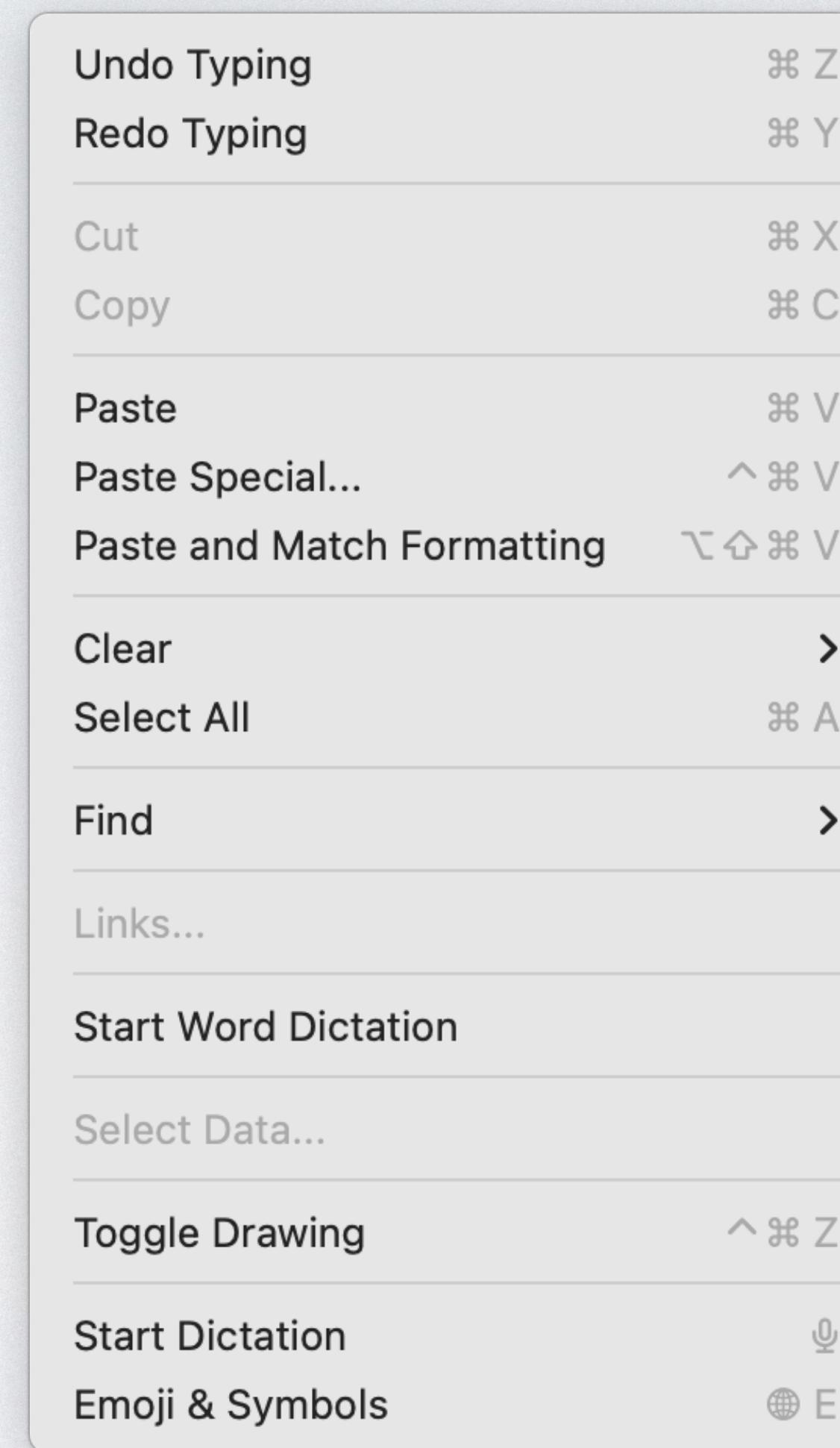
- "Wizards" force users to make choices in an order the developer chose
- Inspectors let users choose in any order



# #4: Consistency and Standards

- People spend more time using other products than your product
- Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform and industry conventions.
- Your "clever" solution can cause confusion

# I'm Looking at YOU, Microsoft

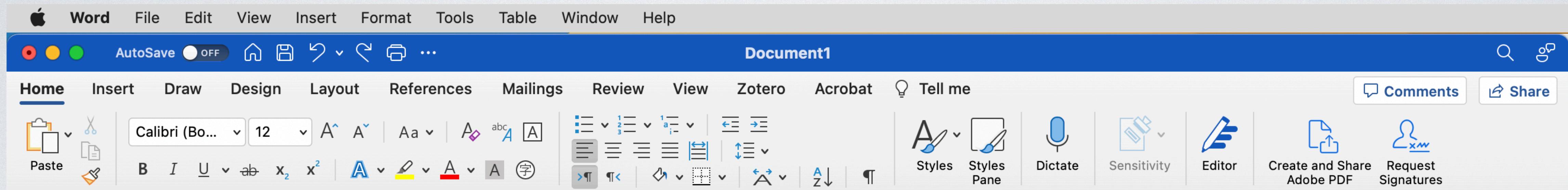


Mac standard for Redo is ⌘ ⌘ Z

# I'm STILL Looking at You, Microsoft

- ^A should move cursor to beginning of line (broken in Microsoft apps)
- Likewise ^E (end of line)

# Not Just Shortcuts



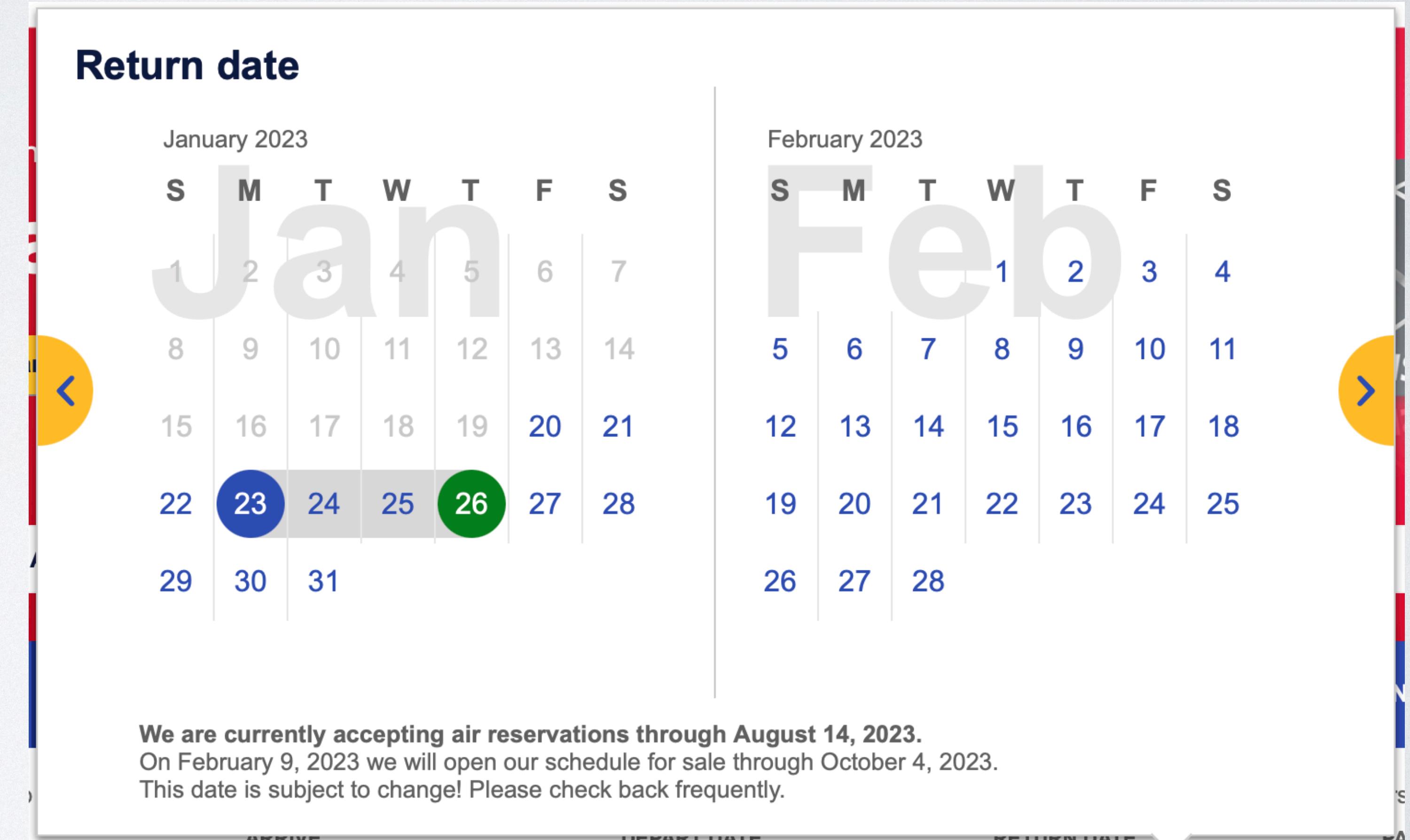
- Two (!??) menu bars, two different sections of buttons

# Error Prevention

- Good error messages are important, but the best designs carefully prevent problems from occurring in the first place. Either eliminate error-prone conditions, or check for them and present users with a confirmation option before they commit to the action.

# Southwest

- Can't set return date before departure date



# Clockify Desktop

Time entry details

Start:	04:56 PM	1/20/2023	<input type="button" value=""/>
End:	04:56 PM	1/20/2023	<input type="button" value=""/>
Total:			

What have you worked on?

No project

Create new project

Billable

Tags

Create new tag

Find tags

Cancel



Change start time: "2:00"

Time entry details

Start:	02:00 AM	1/20/2023	<input type="button" value=""/>
End:	04:56 PM	1/20/2023	<input type="button" value=""/>
Total:	14:56:00		

What have you worked on?

No project

Create new project

Billable

Tags

Create new tag

Find tags

Cancel

# #6: Recognition Rather Than Recall

- Minimize the user's memory load by making elements, actions, and options visible. The user should not have to remember information from one part of the interface to another. Information required to use the design (e.g. field labels or menu items) should be visible or easily retrievable when needed.

# Command Line vs. GUI

- Command line requires you to remember command names
- GUI gives you lists of possible commands in menus

# Capitals

- What's the capital of Portugal?
- Is Lisbon the capital of Portugal?