Text

SWEN-444

Humans and Text – the Reading Process

- **Saccades** – quick, jerky eye movements forward 8-10 letters at a time plus CR/LF to the next line
- **Fixation** – pauses on areas of interest for understanding
- **Regression** – backward saccade due to comprehension, legibility, readability
- Experienced readers **recognize word shapes**
  - First distinguish letters or words, then associate meaning
- **Gutenberg rule** – reading gravity pulls the eyes from the top left to the bottom right

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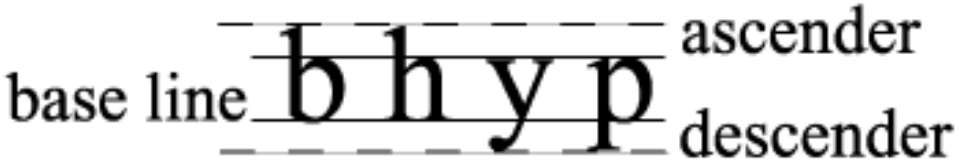
Humans and Text – the Reading Process (cont)

- **Upper case** to identify **single words, lower case** is better for **continuous reading**
- We read extended text passages more quickly in lowercase/mixed case than uppercase
- **Lowercase words** have more **distinctive shapes**



- **Uppercase words** have more **uniform shapes**

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Analog (Paper) versus Digital (Screens)

- **What is the purpose of reading** – continuous (novel) or disjointed scanning?
- Advantages of **digital**?
  - Storage, searching, bookmarking, hyperlinks, transmission, multi reader platforms, sharing
- Advantages of **analog** (paper)?
  - No electricity required
  - More portable in a wide set of conditions
  - Spatial cues (page and book site) aid searching
  - Physical manipulation
  - Annotation, highlighting?
  - Security

Using Text in Interface Design

- **Commentary text** – information about the system or system functionality; Microsoft categories
  - **Contextual help -** immediate assistance without requiring leaving the context of work, such as pop-up menus.
  - **Procedural help -** steps necessary for carrying out a task.
  - **Reference help -** an online reference book.
  - **Conceptual help -** background information, feature overviews, or processes.
- **Instrumental text** – information directly related to user functionality
  - Controls – buttons, checkboxes, icons, menus, etc.
  - Hyperlinks

Design Issues in Using Text

- **Legibility** – essential to be able to distinguish characters and words
  - **Display environment** especially ambient light
  - User **age** and/or vision **disabilities**
  - **Font size**, foreground/background **contrast**
- **Readability** – comprehension of the text
  - **User's language** – avoid jargon, technical language, popular buzz words, specialized metaphors; e.g., "zip a file"
  - **Ambiguity** – misunderstood or unclear meaning of words
    - "Exit" "Quit" "Close"
    - "Hibernate" vs "sleep"

Physical Factors in Text Design

- Reading **performance** and **comprehension** affected by the **interaction** of …..
  - Font size
  - Line length
  - Margin width
  - Vertical line spacing
  - Alignment
  - Contrast
  - Scrolling versus paging
  - Highlighting

Physical Factors in Text Design

- Factors that affect **font size**:
  - **Reading Distance**—Greater distances -> larger text.
  - **Screen Resolution**—Smaller text requires greater resolution to keep the characters clear and legible.
  - **Text/Background Contrast**—Negative contrast is optimal (black type on a white background).
  - **Visual Acuity of User**
  - **Type of Reading**—Text can be scanned, read word by word, or read character by character
  - **General benchmark formula** for font size, given normal vision and optimal conditions:

$$\textbf{Font Size} = 2d(\tan(\theta/2)) \times \textbf{DPI}$$

d= distance, θ = viewing angle

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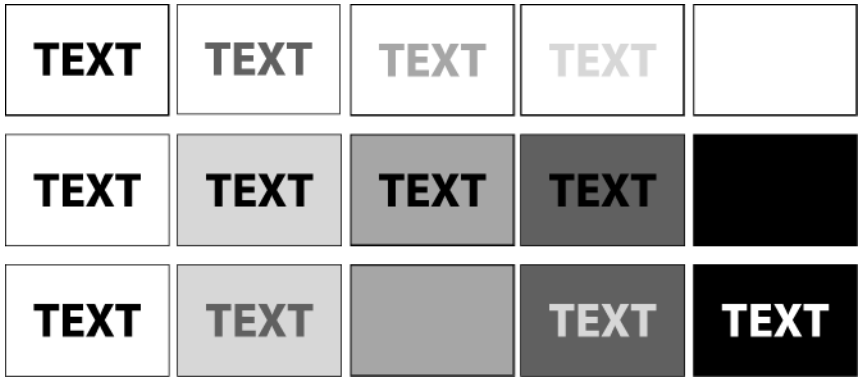
Physical Factors in Text Design (cont)

- **Line length – no difference** for **comprehension** but a **factor for speed and accuracy**
  - Balance reader preference and optimal reading speed; **50 – 100 characters per line**
  - Shorter lines, larger margins
  - Double spacing (but then smaller font size)
- **Margin width**
  - **Shorter lines**—4 inches—with **large margins** increased reading performance
  - Maximal use of white space
- **Alignment –** left, right, centered, justified
  - **Avoid right and centered** for best reading performance
  - Text is another graphical page element for page layout

Physical Factors in Text Design (cont)

- **Contrast –** between text and its background
  - In general, best readability is **background brighter than text**
  - Most readable black and white – **black text on white background**
  - Most readable color – ?? **green text on white background**



Green text on white background

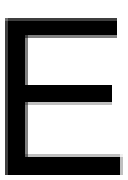
Physical Factors in Text Design (cont)

- **Paging versus scrolling**
  - **Paging generally preferred** but research is mixed
  - Best choice depends on the task, layout, and UI technology
  - Selected guidelines:
    - Eliminate horizontal scrolling
    - Scrolling better for reading comprehension
    - Facilitate rapid scrolling while reading
    - Provide page navigation hyperlinks (previous, next)
- **Text highlighting** – bold, italics, underlining, color, etc. for emphasis

Digital Text Representation

- **Character** – the representation of a letter, number, or other symbol
- **Glyph** – the physical representation of a character (or combinations) as a **graphical pattern** – A
- **Character repertoire – all** the **glyphs** required to create the characters for a **language**
- **Character set – digital encoding** scheme such as ASCII or Unicode for a **character repertoire**
- **Fonts** – a **specific design** for the **glyphs in a character repertoire**
- **Typeface –** family of fonts based on the same glyphs but with different design features (e.g., width)

Fonts



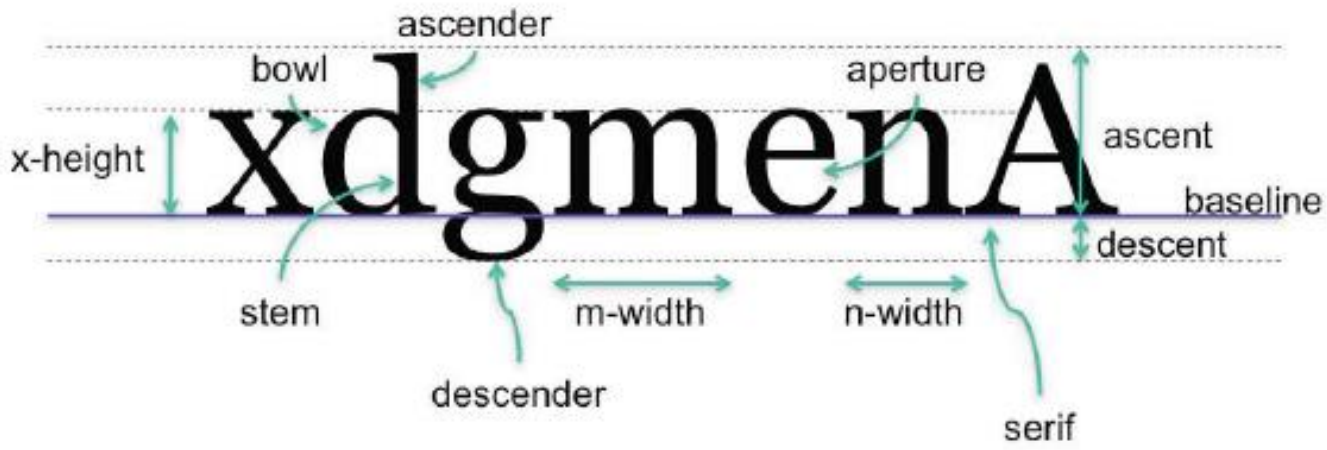
Serif Sans-Serif Cursive

Variable-width font ioioioioio

Fixed-width font `ioioioioio`

Text

- Don’t use more than 2 or 3 typefaces, 4 -5 fonts



Dimensions of a font

Why Fonts Matter!