CS112 Retrospective & the Future

CS112 Scientific Computation
Department of Computer Science
Wellesley College

Assignment #1: Golden Ratio, Olympics, & Stars

- Variables and assignment
- Mathematical computations
- Vectors
- Plotting

![2020 Summer Olympics in Tokyo]

![Supernova and White Dwarfs Diagram]
Assignment #2: Conditionals, Colon Notation, Analyze/Visualize Ocean/Smartphone Data

- Conditionals
- Cell arrays
- Indexing & colon notation
- Logical values and expressions
- Data analysis and visualization

Assignment #3: Gradesheets, Energy Data & Face Recognition

- Matrices
- Real and synthetic images
- Tables of data
- Image processing
Assignment #4: Spirograph, Pole Vault, cftool, Rising Data

- Curve fitting & parameterized equations
- Linear regression
- Loops
- User-defined functions
- Colormaps

Assignment #5: Ubbidubbifier & Spread of Disease

- String processing
- Nested loops
- Model simulation

```matlab
>> ubbi('cs112 makes me so happy!')
ans =
    cs112 mubakubes mube subo hubappuby!
```
Assignment #6: GUI Sketchpad & Making Music

- Structures
- Graphics handles
- Properties
- GUIs
- Layout editor

Assignment #7: Thumbnails & Parlez-vous Francais?

- Reading/writing files
- Working with directories
- Analyzing textual data
- Cell arrays
- Frequency statistics

\[
\chi^2_c = \sum \frac{(O_i - E_i)^2}{E_i}
\]

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Spanish 10.78: "The waves are strong."  
German 15.13: "Die Wogen sind stürmisch."  
Finnish 21.68: "Hetkän pankein voi toivoo muita ala luntea nihin."  
French 13.03: "Il faut battre le fer pendant qu’il est chaud."  
English 10.55: "This great English sentence is too long and trite."  
Italian 10.78: "Con piacere, colgo l’occasione di ringraziare tutti gli amici italiani che con i loro consigli..."
Assignment #8: Mobius Strip, Campus Places, Reaching for the Stars

- Types of numbers
- Color images & colormaps
- 3D visualization

What next in CS?

CS 112 Computation for the Sciences → CS 111 Computer Programming and Problem Solving
CS 220 Human-Computer Interaction → CS 230 Data Structures
CS 332 Visual Processing by Computer and Biological Vision Systems → CS 232 Artificial Intelligence
CS 204 Introduction to Front-End Web Development → CS 234 Data, Analytics & Visualization
CS 240 Introduction to Machine Organization → CS 313 Computational Biology