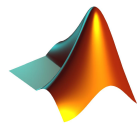


CS112 Retrospective & the Future

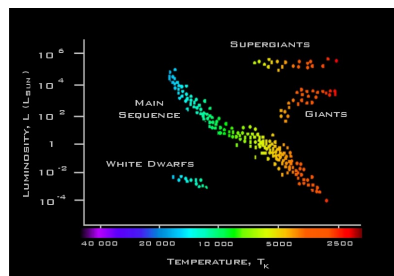
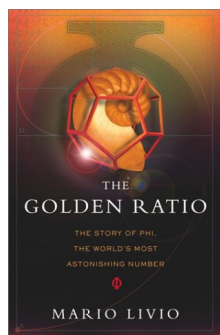
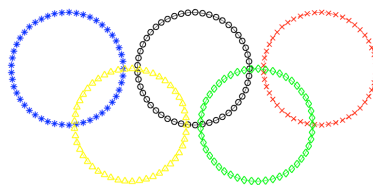


CS112 Scientific Computation
Department of Computer Science
Wellesley College

Assignment #1: Golden Ratio, Olympics, & Stars

- Variables and assignment
- Mathematical computations
- Vectors
- Plotting

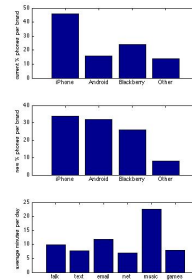
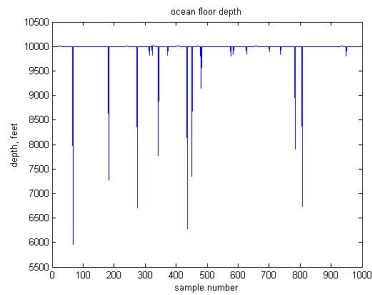
2020 Summer Olympics in Tokyo



Assignment #2: Conditionals, Colon Notation, Analyze/Visualize Ocean/Smartphone Data

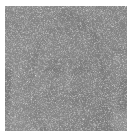
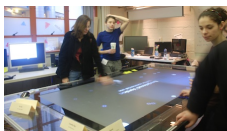
- Conditionals
- Cell arrays
- Indexing & colon notation
- Logical values and expressions
- Data analysis and visualization

```
>> nums = 1:8
nums =
     1     2     3     4     5     6     7     8
>> nums(1:2:5) = 10
nums =
    10     2    10     4    10     6     7     8
>> nums(2:3:8) = [13 9 16]
nums =
    10    13    10     4     9     6     7    16
>> nums2 = nums([1:3 6:8])
nums2 =
    10    13    10     6     7    16
>> nums([1:3 6:8]) = 12:-2:2
nums =
    12    10     8     4     9     6     4     2
>>
```

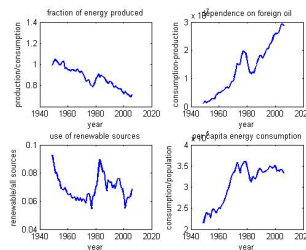
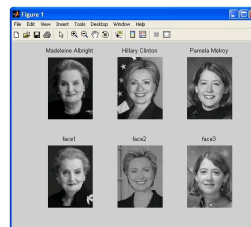


Assignment #3: Gradesheets, Energy Data & Face Recognition

- Matrices
- Real and synthetic images
- Tables of data
- Image processing

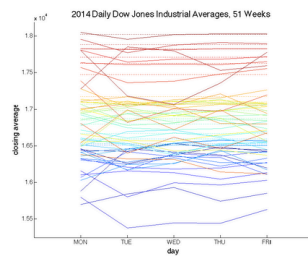
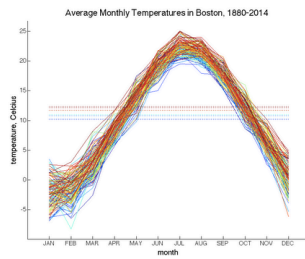
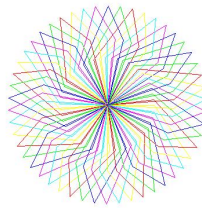
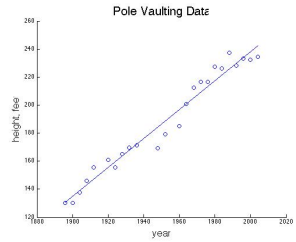


Name	Homework	Participation	Exam 1	Exam 2	Final Project
Camila	83	90	76	80	88
Barb	79	80	80	81	70
Shana	90	90	92	98	94
Diana	72	75	63	75	73
Nour	88	90	78	89	82
Alisha	67	65	69	72	80



Assignment #4: Spirograph, Pole Vault, cftool, Rising Data

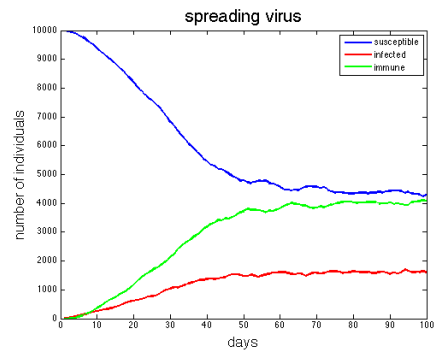
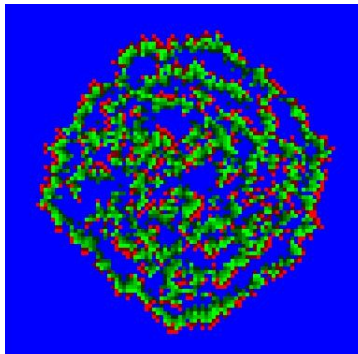
- Curve fitting & parameterized equations
- Linear regression
- Loops
- User-defined functions
- Colormaps



Assignment #5: Ubbidubbifier & Spread of Disease

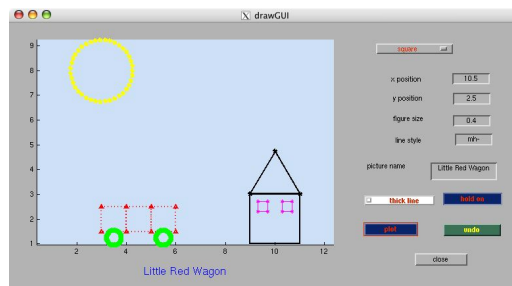
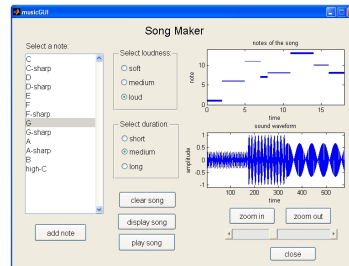
- String processing
- Nested loops
- Model simulation

```
>> 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



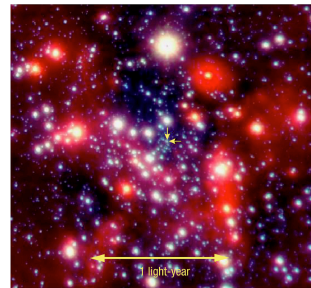
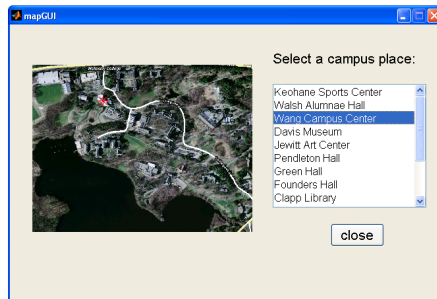
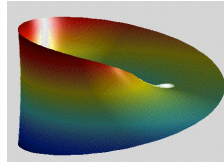
$$\chi_c^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

English	German	Finnish	French	Italian	Spanish
e 12.31	e 18.46	a 12.06	e 15.87	e 11.79	e 13.15
t 9.59	n 11.42	i 10.59	a 9.42	a 11.74	a 12.69
a 8.05	i 8.02	t 9.76	i 8.41	i 11.28	o 9.49
o 7.94	r 7.14	n 8.64	s 7.90	o 9.83	s 7.60
n 7.19	s 7.04	e 8.11	t 7.26	n 6.88	n 6.95
i 7.18	a 5.38	s 7.83	n 7.15	l 6.51	r 6.25
s 6.59	t 5.22	l 5.86	r 6.46	r 6.37	l 6.25
r 6.03	u 5.01	o 5.54	u 6.24	t 5.62	l 5.94
h 5.14	d 4.94	k 5.20	l 5.34	s 4.98	d 5.58

Spanish	19.19	entre broma y broma, la verdad se asoma
German	36.33	viele koche verderben den brei
Finnish	21.68	ihmetapuksiin voi toivoa mutta ala luota niihin
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	10.26	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



The Centre of the Milky Way
(VLT YEPUN + NACO)

ESO PR Photo 23a/02 (9 October 2002) © European Southern Observatory

What next in CS?

