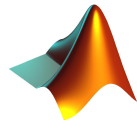


# CS112 Retrospective & the Future

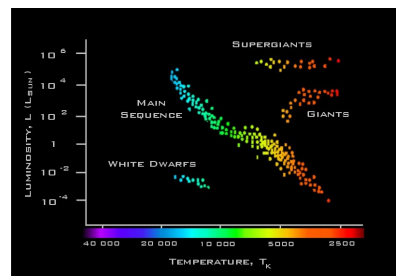
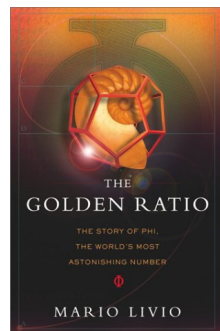
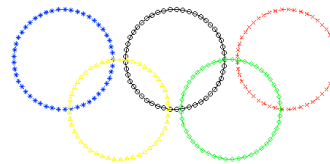


**CS112 Scientific Computation**  
Department of Computer Science  
Wellesley College

## Assignment #1: Golden Ratio, Olympics, & Stars

- Variables and assignment
- Mathematical computations
- Vectors
- Plotting

2014 Winter Olympics

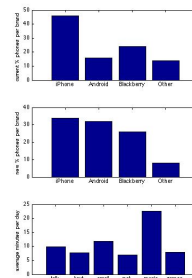
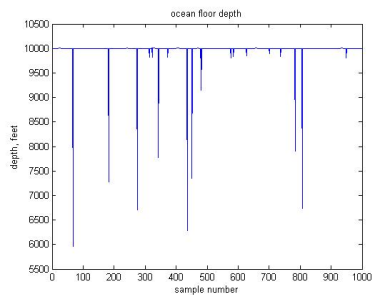


## Assignment #2: Conditionals, Colon Notation, Analyze/Visualize Ocean/Smartphone Data

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

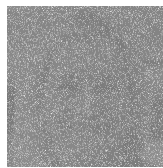
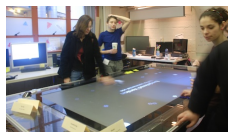
```

>> 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
>>
    
```

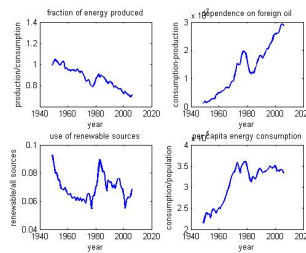
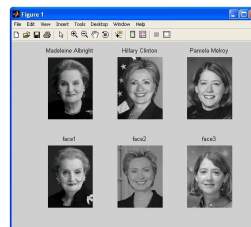


## Assignment #3: Mystery, Thatcher Illusion, Gradesheets, Energy Data & Face Recognition

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

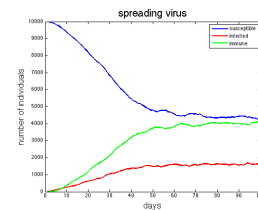
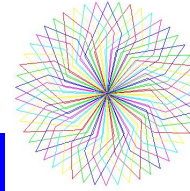
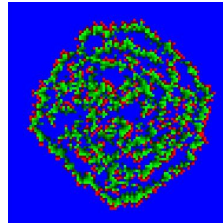
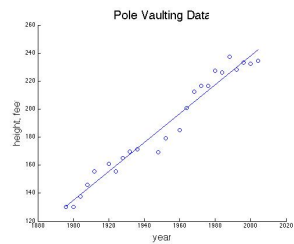


Name	Homework	Partic.	Exam 1	Exam 2	Final Project
Ann	83	90	76	80	88
Barb	79	80	80	81	70
Chelsea	90	90	92	98	94
Diana	72	75	63	75	73
Ella	88	90	78	89	82
Fiona	67	65	69	72	80



## Assignment #4: Spirograph, Pole Vault, cftool, Spread of Disease

- Curve fitting & parameterized equations
- Loops
- User-defined functions
- Regression models
- Simulating models



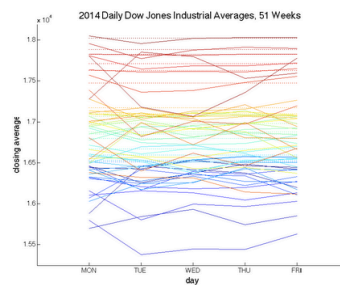
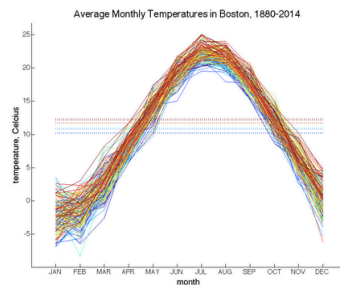
## Assignment #5: Facebook Friends, Favorite Songs, Rising Data

- Structures & storing structures in a vector
- while loops
- colormaps



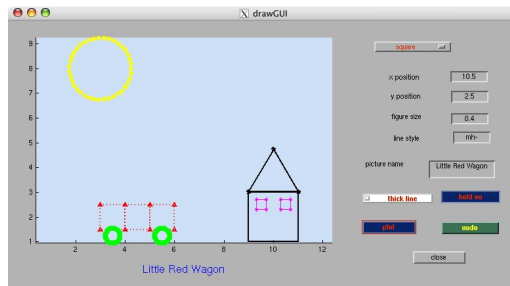
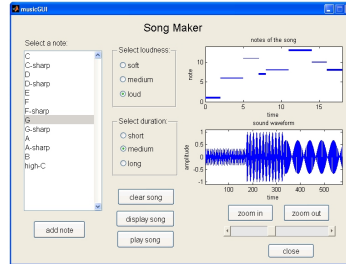
```
>> mostFacebookFriends(students)
nora has the most Facebook friends, with 142
```

```
>> printStudentInfo(students)
andrea's favorite song is "Dark Horse" and she has 42 Facebook friends
carol's favorite song is "Team" and she has 61 Facebook friends
jean's favorite song is "Pompeii" and she has 23 Facebook friends
...
```



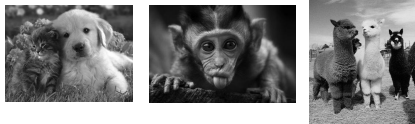
## Assignment #6: GUI Sketchpad & Making Music

- 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

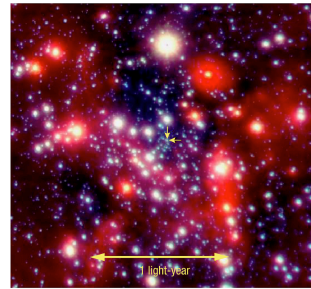
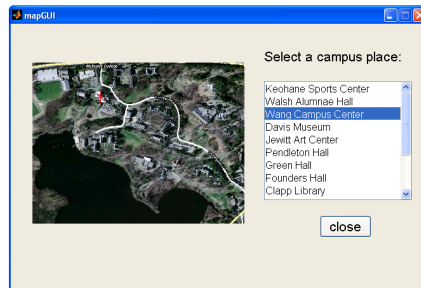
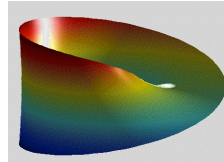


English	German	Finnish	French	Italian	Spanish
e 12.31	e 18.46	a 12.06	e 15.87	e 11.79	e 13.15
t 9.59	n 11.42	i 10.59	a 9.42	a 11.74	a 12.69
a 8.05	i 8.02	t 9.76	l 8.41	i 11.28	o 9.49
o 7.94	r 7.14	n 8.64	s 7.90	o 9.83	s 7.60
n 7.19	s 7.04	e 8.11	t 7.26	n 6.88	n 6.95
i 7.18	a 5.38	s 7.83	n 7.15	l 6.51	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	ihmetapauksiin 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

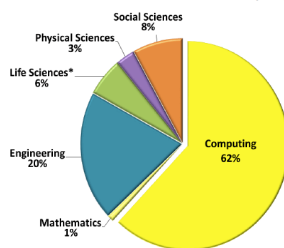


The Centre of the Milky Way  
(VLT YEPUN + NACO)  
ESO PR 16/00-25/02 (9 October 2002) © European Southern Observatory

## What else is there in CS?

- Having taken CS112, you have the tools to solve fundamental problems with computer programs
- In future computational courses, you can investigate more complex and creative problems

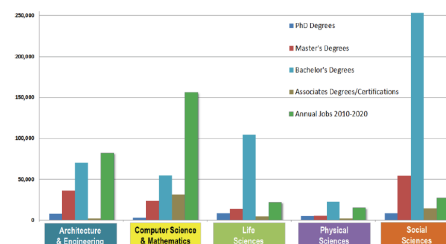
Where the STEM Jobs Will Be  
Projected Annual Growth of NEWLY CREATED STEM Job Openings 2010-2020



\*STEM is defined here to include non-medical occupations.  
Source: Jobs data are calculated from the Bureau of Labor Statistics (BLS), Employment Projections 2010-2020, available at <http://www.bls.gov/emp/>. Courtesy of the Association for Computing Machinery - <http://acm.org>

Computing Research Association - [cra.org](http://cra.org)

Where the STEM Jobs Will Be  
Degrees vs. Jobs Annually



Source: Compiled by the Association for Computing Machinery U.S. Public Policy Office. <http://acm.org/public-policy> Degree data are calculated from the National Science Foundation (NSF), Science and Engineering Indicators 2012, available at <http://www.nsf.gov/statistics/indicators/>. Annual job data are calculated from the Bureau of Labor Statistics (BLS), Employment Projections 2010-2020, available at <http://www.bls.gov/emp/>. STEM is defined here to include non-medical degrees and occupations.

Computing Research Association - [cra.org](http://cra.org)

## What next in CS?

