CMSC 110
Introduction to Computing

Deepak Kumar

Administrivia
CMSC110: Introduction to Computing
Fall 2013

Course Website: http://cs.brynmawr.edu/Courses/cs110/fall2013dk/

Instructor:
Deepak Kumar, Ph.D. (dkumar@cs.brynmawr.edu)

Lectures
TuTh 2:15p to 3:45p in Park 338

TA-Support
>20 hrs/week in Park 231

Open Labs (Optional)
Wed 10:00p to Noon in Park 231

Office Hours
Available by appointment. Walk-ins are welcome!

Grading		
• 7 Assignments	56%
• In-class Quizzes	4%
• Exam 1	18%
• Exam 2	26%
Total	100%

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Administrivia

Software - Required
Processing 2.X
– Already installed in the CS Lab
– Also available for your own computer @ www.processing.org
– Processing == Java

Book - Required
Creative Coding & Generative Art in Processing 2
by Ira Greenberg, Dianna Xu, Deepak Kumar, friendsofEd/APress, 2013. Available at the Campus Bookstore or amazon.com or other vendors. Prices vary, shop around.

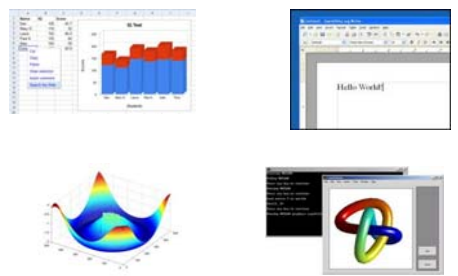GXK2013   3

Class Lottery

• Make sure to sign-in your name.

• If you are not "in" the lottery, indicate that. We will contact you by e-mail as soon as we have confirmation from other students.

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What is Computing?

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Computing: Your Parent's View

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Computing: internet, e-mail, network…

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Computing: Digital Photography

http://www.alanzeyes.com/2009/02/hdr-photography.html   8
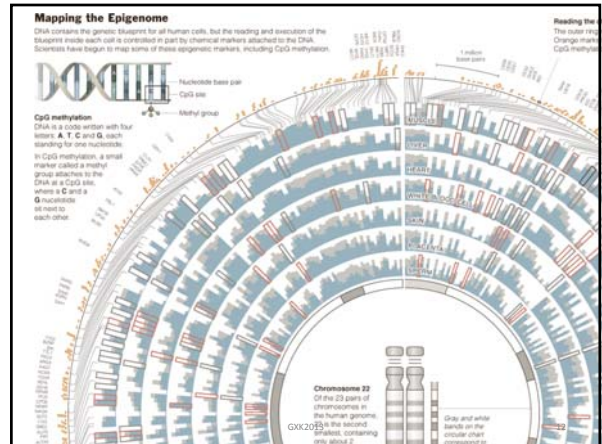
Computing: Entertainment…

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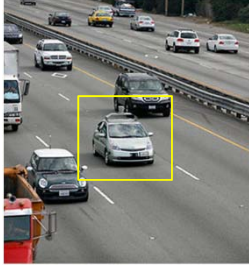## Computing: Entertainment…

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Cutting Edge Computer Science

Google's Autonomous Car

- Nevada made it legal for autonomous cars to drive on roads in June 2011
- California introduced a similar bill in Aug 2012

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2011 Jeopardy!

- In February 2011, IBM Watson bested Brad Rutter (biggest all-time money winner) and Ken Jennings (longest winning streak)
- IBM is currently applying Watson's technology to medical diagnosis and legal research

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ART

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Protobytes
By Ira Greenberg

Areas in Computer Science

Artificial Intelligence	Robotics	Human-Computer Interaction	Computer Graphics	Computer Vision
Operating Systems	Computer Networking	Databases	Computer Security	Ubiquitous Computing

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What is Computer Science?

Computer science is the study of solving problems using computation
  – Computers are part of it, but the emphasis is on the problem solving aspect

Computer scientists work across disciplines:

Mathematics	Geoscience	Medicine/Surgery
Biology (bioinformatics)	Archeology	Engineering
Chemistry	Psychology	Linguistics
Physics	Sociology	Art
Geology	Cognitive Science	…

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"Computer science is no more about computers than astronomy is about telescopes"

- Edsger Dijkstra

Introduction to Creative Computing

Computing

Visualizations · Programming

Aesthetics & Art · Algorithms

Processing/Java · Computational Media

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Algorithms

An **algorithm** is an effective method for solving a problem expressed as a finite sequence of instructions. For example,

Put on shoes
  left sock
  right sock
  left shoe
  right shoe

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Programming = Writing Apps

Programming is the process of designing, writing, testing, debugging / troubleshooting, and maintaining the source code of computer programs. This source code is written in a programming language.

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A program

```
int areaOfCircle(int radius){
   return PI*radius*radius;
}

r = 10;
area = areaOfCircle(r);
```

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Programming Languages

Processing	Python	Lisp

int areaOfCircle(int radius){
   return PI*radius*radius;
}
 	
r = 10;
area = areaOfCircle(r);
	def areaOfCircle(radius):
	   return PI*radius*radius;
	
	r = 10
	area = areaOfCircle(r)
		(defun areaOfCircle (radius)
		   (return (* PI radius radius)))
		
		(setq r 10)
		(setq area (areaOfCircle r))

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A more interesting program...

```
Eye e1, e2, e3, e4, e5;                          class Eye
                                                 {
void setup()                                       int ex, ey;
{                                                  int size;
  size(200, 200);                                  float angle = 0.0;
  smooth();
  noStroke();                                      Eye(int x, int y, int s) {
  e1 = new Eye( 50,  16,  80);                        ex = x;
  e2 = new Eye( 64,  85,  40);                        ey = y;
  e3 = new Eye( 90, 200, 120);                        size = s;
  e4 = new Eye(150,  44,  40);                      } // Eye()
  e5 = new Eye(175, 120,  80);
} // setup()                                       void update(int mx, int my) {
                                                      angle = atan2(my-ey, mx-ex);
void draw()                                        } // update()
{
  background(102);                                 void display() {
                                                      pushMatrix();
  e1.update(mouseX, mouseY);                          translate(ex, ey);
  e2.update(mouseX, mouseY);                          fill(255);
  e3.update(mouseX, mouseY);                          ellipse(0, 0, size, size);
  e4.update(mouseX, mouseY);                          rotate(angle);
  e5.update(mouseX, mouseY);                          fill(153);
                                                      ellipse(size/4, 0, size/2, size/2);
  e1.display();                                       popMatrix();
  e2.display();                                    } // display()
  e3.display();                                  } // class Eye
  e4.display();
  e5.display();
} // draw()
```
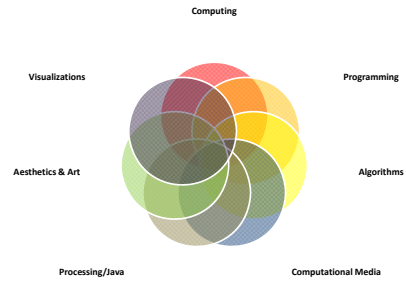
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Our Goal

- Use computing to realize works of art

- Explore new metaphors from computing: images, animation, interactivity, visualizations

- Learn the basics of computing

- Have fun doing all of the above!

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Introduction to ^ **Creative** Computing

Computing

Visualizations   Programming

Aesthetics & Art   Algorithms

Processing/Java   Computational Media

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Examples

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Shepard Fairey

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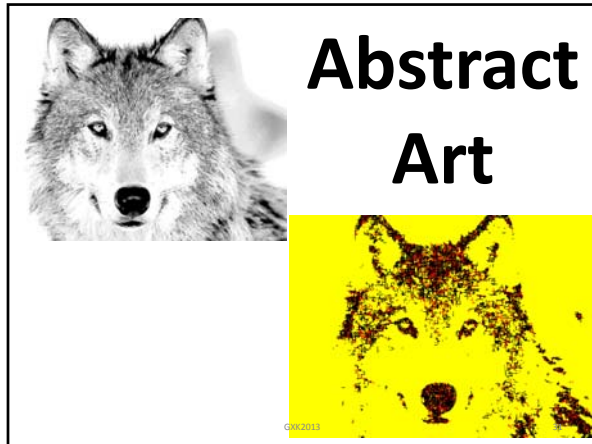GXK2013   29

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Abstract Art

Summertime

Summertime,
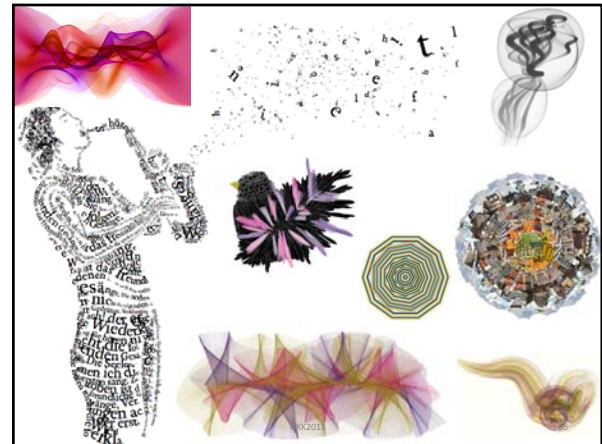And the livin' is easy
Fish are jumpin'
And the cotton is high

Your daddy's rich
And your mamma's good lookin'
So hush little baby
Don't you cry

One of these mornings
You're going to rise up singing
Then you'll spread your wings
And you'll take to the sky

But till that morning
There's a'nothing can harm you
With daddy and mamma standing by

Summertime,
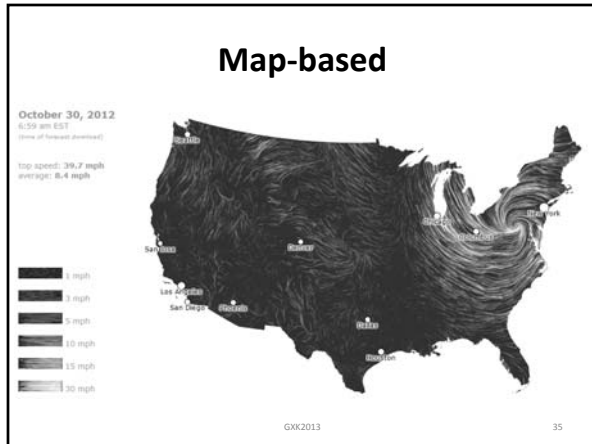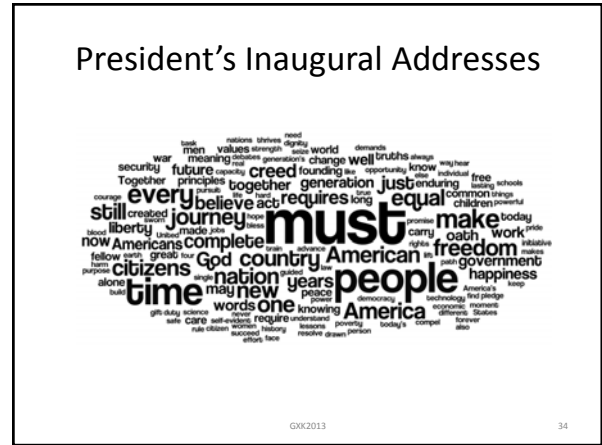And the livin' is easy
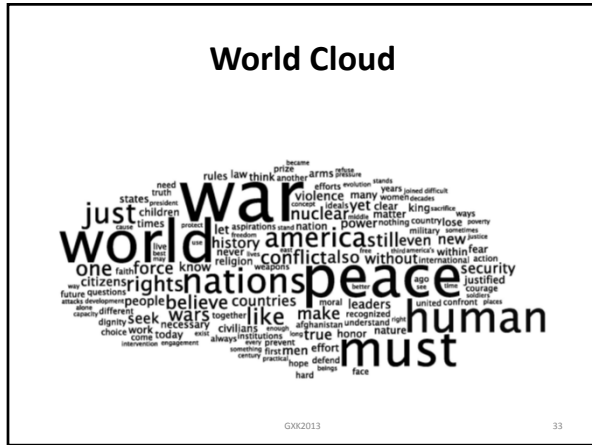Fish are jumpin'
And the cotton is high

Your daddy's rich
And your mamma's good lookin'
So hush little baby
Don't you cry

Lyrics by George Gershwin

Word Cloud

Created using: wordle.net

World Cloud

President's Inaugural Addresses

Map-based

October 30, 2012
6:59 am EST

top speed: 39.7 mph
average: 8.4 mph

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Box Office Earnings

From: The Ebb and Flow of Movies: Box Office Receipts 1986 — 2008
nytimes.com
February 23, 2008
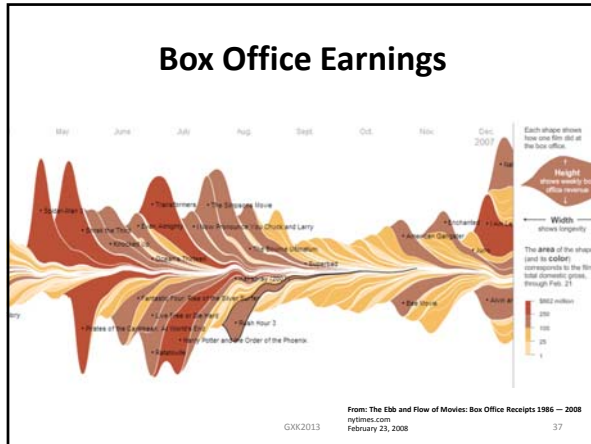
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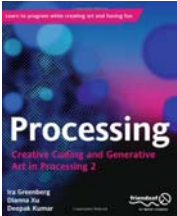

Let's get started…

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Administrivia

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Book

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Homework

- Go the CS Computer Lab (Room 231 PSB)
- Log in
- Start the Processing application
  (Make sure it is Version 2.x)
- In a web browser, go to the Tutorials section of processing.org

  http://www.processing.org/tutorials/gettingstarted/

- Read the Getting Started tutorial (by Casey Reas & Ben Fry) and try out the two examples of simple Processing programs presented there
- If you'd like, install Processing 2.x on your own computer
- Read Chapter 1 (Read pages 1-12, skim 12-32)

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