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 10:00a 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%

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.

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.

What is Computing?
Computing: Your Parent’s View
Computing: internet, e-mail, network...

Computing: Digital Photography


Computing: Entertainment...

Computing: Entertainment...

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

Google's Autonomous Car

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

Areas in Computer Science

Artificial Intelligence
Robotics
Human-Computer Interaction
Computer Graphics
Computer Vision

Operating Systems
Computer Networking
Databases
Computer Security
Ubiquitous Computing

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

“Computer science is no more about computers than astronomy is about telescopes”

- Edsger Dijkstra
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

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.

A program

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

r = 10;
area = areaOfCircle(r);

A more interesting program...

class Eye:
    def __init__(self, x, y, s):
        self.ex = x;
        self.ey = y;
        self.size = s;

    def update(self, mx, my):
        self.angle = atan2(my - self.ey, mx - self.ex);

    def display(self):
        pushMatrix();
        translate(self.ex, self.ey);
        fill(255);
        ellipse(0, 0, self.size, self.size);
        rotate(self.angle);
        fill(153);
        ellipse(self.size/4, 0, self.size/2, self.size/2);
        popMatrix();

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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!

Creative Computing

Introduction to Creative Computing

Examples

Shepard Fairey

Shepard Fairey
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 goin' 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 standin' 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
Box Office Earnings

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Let’s get started...

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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 12-33)