

Welcome to
CS 105
Introduction to Computer
Programming (using JavaScript)



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Room 2110



2/6/2018

Computer Science Course Sequence

- 1 CS-105: Intro programming JavaScript and HTML5,
 - 2 CS-152: Intro programming Java. More rigorous than 105.
 - 3 CS-251: Intermediate programming Java.
 - 4 CS-261: Mathematical Foundations of Computer Science.
 - 4 CS-241: Data Organization using C.
- CS 357: Declarative Programming.
CS-351: Design of Large Programs.
CS-361: Algorithms I.

★ **Blackboard Learn:** <https://learn.unm.edu/>


■ Turn-in Assignments
■ Grades
■ Discussions

★ **Class Website:** www.cs.unm.edu/~joel/cs105

■ Syllabus
■ Lecture Notes
■ Lab times /e-mail
■ Videos
■ Source Code

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Assignment:
Reading, Watching, Doing and Lab

- Due Thursday, Jan 18:
 - Watch/Do ,  **KHANACADEMY**
 - Videos assigned on for week 1 on Website
 - First i-clicker Quiz
- Due Sunday, Jan 28 (midnight in Blackboard Learn):
 - Lab 1: Drawing and Animation
 - Edit the `.html` file on the class website and attach in Blackboard Learn.

Use JavaScript and HTML5 canvas to draw (using lines, rectangles, and arcs) a picture that convey some message where some part of the picture changes every frame.

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Course Structure

Lecture / Discussion : 2x per week required.

- Tuesday / Thursday 9:30 – 10:45 AM
- i-clicker quizzes
- *Bring laptop or sit next to someone with laptop.*

Lab Class: 1x per week required.

- Attend as many extra lab classes as you find helpful.
- A schedule of all lab sections is (will be) on website.

Blackboard Learn Discussions:

- Q & A on lab assignments, etc.
- Windows, Mac, Linux specific issues.

Office Hours:

- 6 ■ My Office hours or those of ANY CS-105 Lab instructor.

Course Grading

Each student's final course grade is a **weighted average** of four component grades (formula is in the syllabus):

- 60% Lab Projects (lowest lab is dropped).
- 10% Quizzes (in class i-clicker).
- 30% Exams (Midterm and Final).

Note: When calculating your course grade, DO NOT add lab project points to quiz points or to exam points.

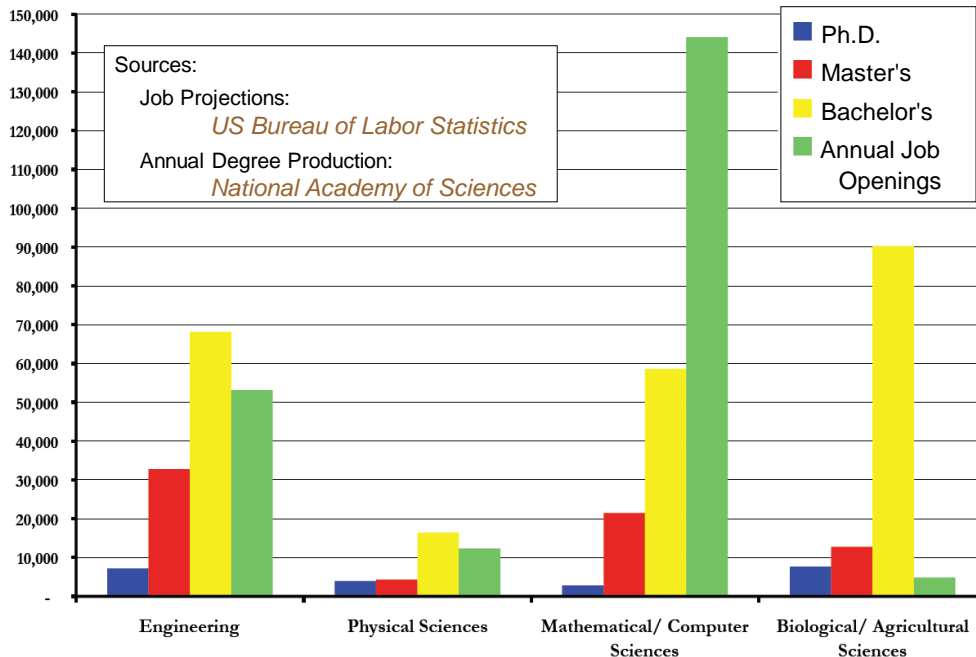
Doing so is like saying:

"4 yuan + 6 pesos must equal 10 dollars".

Thus, Blackboard Learn shows the **INCORRECT** course grade !

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Annual Degree Production (2006) and Annual Projected Job Openings in S&E Fields (2008-2018)



U.S. Bureau of Labor Statistics

(<http://data.bls.gov/projections/occupationProj>)

Computer Programming:

- Median Pay, 2012: \$74,280 / year
- Entry-Level Education: Bachelor's degree
- Number of Jobs, 2012: 1.2 million




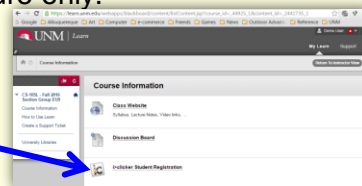
"Despite the economic slowdown of the early 2000s, Computer programmers are likely to remain in high demand in the U.S. for the next decade."

[in 2010] *"Women hold only 21% of the baccalaureate or higher information technology jobs, yet this field has the largest number of woman who report being "highly satisfied" in their career."*

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- We will use i-clicker for quizzes in lecture only.
- We will use i-clicker every lecture.
- Register your i-clicker via Blackboard Learn. 
- Some classes may require you to register in a different way or with a different ID number (i.e. student number). If so, register again for this class.
- It is okay if you have a used i-clicker or are sharing an i-clicker with a friend who needs it for a different class at a different time.
- If the i-clicker website requires you to pay an extra re-registration fee, then let me know and after class, with your i-clicker, we can register it locally without the fee.



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Forgotten i-clicker?

- If you forget your i-clicker or its batteries are dead, *you may borrow a class loner i-clicker.*
- Each loner i-clicker has an animal picture.
- If you borrow an i-clicker, to get credit, you must **e-mail me on the same day:**
 - **Subject:** CS-105 borrowed i-clicker
 - **Body:** Name, Date, and Animal.
- If you have something else to e-mail me on the same day, **send a separate e-mail!!!**

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i-clicker

Quiz Question #1:

Do you have your i-clicker?

- Yes – I am ready to go.
- I bought one from the bookstore, but forgot it.
- My dog ate it.
- No – I did not get one yet.
- What is an i-clicker anyway?



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Quiz: Which Image Does this Code Draw?

Center X-axis

Center Y-axis

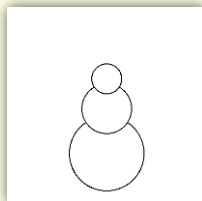
```
ellipse(100, 100, 100, 100);  
ellipse(200, 100, 100, 100);  
ellipse(300, 100, 100, 100);
```

It is okay to use your notes on quizzes.

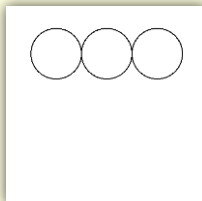
On the exams, you may bring one 8½×11 page of notes.

Width

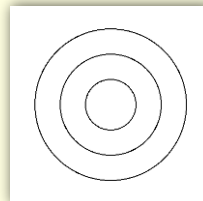
Height



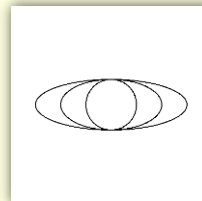
(a)



(b)



(c)



(d)

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Quiz: Which Image Does this Code Draw?

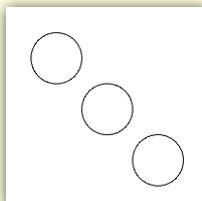
Center X-axis

Center Y-axis

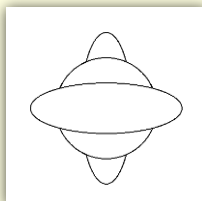
```
ellipse(200, 200, 300, 100);  
ellipse(200, 200, 200, 100);  
ellipse(200, 200, 100, 100);
```

Width

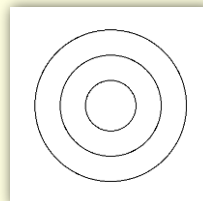
Height



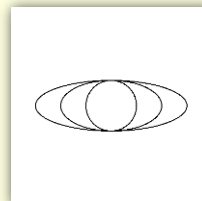
(a)



(b)



(c)



(d)

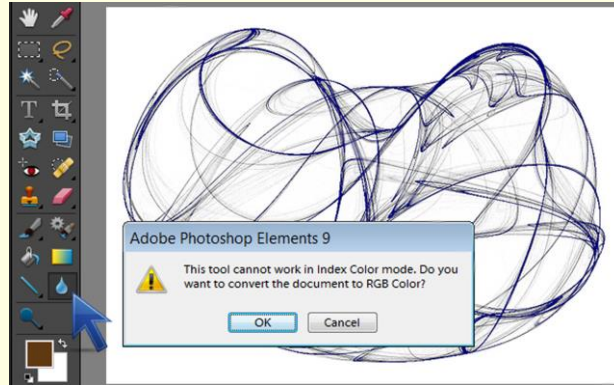
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Writing verses Using Software

Authoring a computer program is like writing an essay.
NOT like learning to use software such as Photoshop,
PowerPoint or League of Legends.

Software, such as
Photoshop, is
often learned by
"click and explore"

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Computer Programming Language

A **computer programming language** is a set of
symbols and rules designed for humans to
more easily represent computer instructions.

A **computer program** is a
sequence of instructions
– like a recipe.

However, in a computer
program, the instructions
usually contain many
branches and **loops**.



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Save, Save As..., and Multiple Media



Whenever you spend an hour or more working on a program, please, create a backup copy with a version number added to the filename.

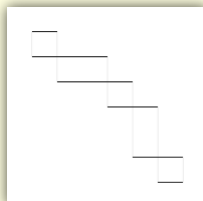
Whenever you finish working for a few hours, copy your latest backup to a different media.

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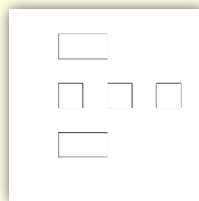
Quiz: Which Image Does this Code Draw?

Left Top Width Height

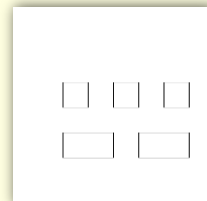
```
rect( 50, 50, 50, 50);  
rect(100, 100, 100, 50);  
rect(200, 150, 50, 50);  
rect(250, 200, 50, 100);  
rect(300, 300, 50, 50);
```



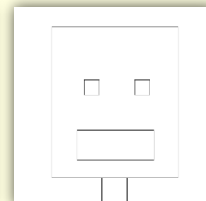
(a)



(b)



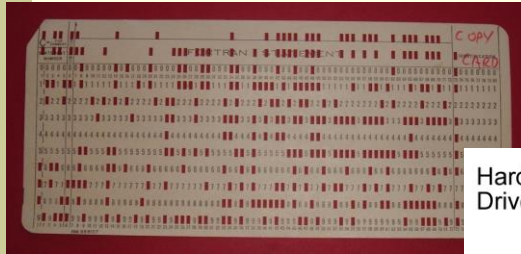
(c)



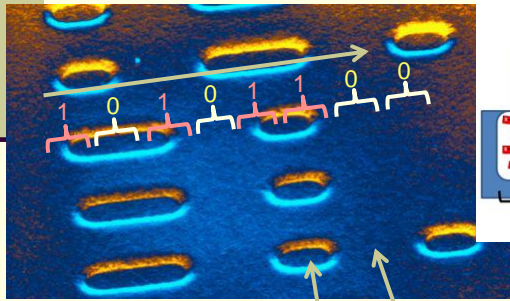
(d)

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A Computer File is Just a List of 1s & 0s

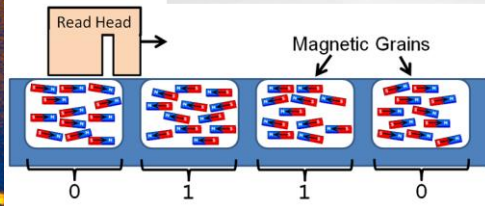


Hard Disk Drive (HDD)



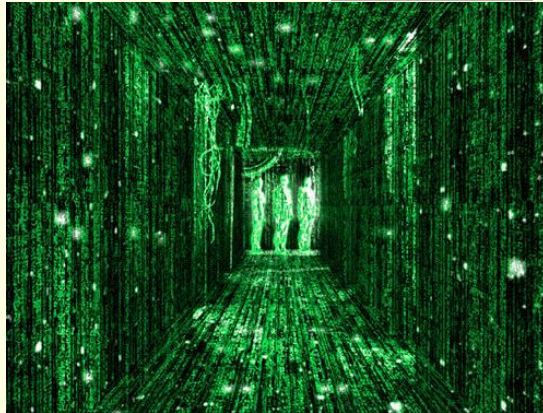
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Pit Land



In the Computer, it is All Just Numbers

- Bach's Sonata No. 5 in F minor
- Owl City's Fireflies
- The motion picture: Shrek Forever After
- Hamlet, Prince of Denmark.
- World of Warcraft



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Small Language with Complex Usage

- Programming Languages are much smaller than natural languages.
- However, programming languages are primarily used to express **complex conditional (branching) logic** not found in common uses of natural languages.
- Logic skills (from one programming language or from Philosophy or Mathematics) have strong carryover.



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Window into How Computers Think

Easy:

- Using only standard arithmetic operations, it takes a few hours to write a JavaScript program that can solve large systems of differential equations.

Hard:

- Being given a bunch of photographs of everyday life, the world's most powerful computer running the world's best artificial intelligence software is currently incapable of deciding this is a photo of a woman walking a dog.



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Quiz: Which Image Does this Code Draw?

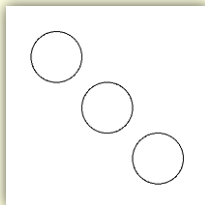
Center X-axis

Center Y-axis

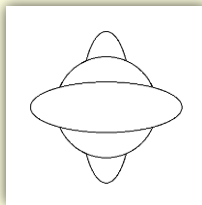
```
ellipse(100, 100, 100, 100);  
ellipse(200, 200, 100, 100);  
ellipse(300, 300, 100, 100);
```

Width

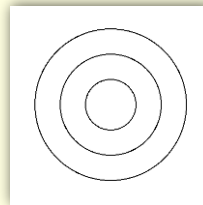
Height



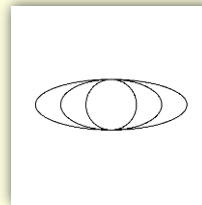
(a)



(b)



(c)



(d)

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