CMSC 110
Introduction to Computing
Section 2
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What is Computing?

Computing: Web, e-mail, social...

Computing: Productivity...

Computing: Digital Photography

Computing: Entertainment...
Computing: Gaming...

Computing is important.

Fastest Growing Occupations

Table 1.3 Fastest growing occupations, 2008 and projected 2018
(Numbers in thousands)

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Network systems and data communications analysts</td>
<td>292.0</td>
<td>447.8</td>
<td>155.8</td>
<td>53.36</td>
<td>VH</td>
</tr>
<tr>
<td>Computer software engineers, applications</td>
<td>514.8</td>
<td>689.9</td>
<td>175.1</td>
<td>34.01</td>
<td>VH</td>
</tr>
<tr>
<td>Computer software engineers, systems software</td>
<td>394.8</td>
<td>515.0</td>
<td>120.2</td>
<td>30.44</td>
<td>VH</td>
</tr>
</tbody>
</table>


How many of us are studying CS?
United States and Canada

Secondary Schools

What can be programmed?
How do you program?

What is a Computer Program?
A collection of human readable statements that can be translated to machine instructions and executed by a computing device.

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!
Why?

Examples

Shepard Fairey
Summertime

Lyrics by George Gershwin

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 gonna rise up singing
Then you'll spread your wings
And you'll take to the sky
But till that morning
There's 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
Who owes how much to whom?

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

Book

Primitive 2D Shapes
- point
- line
- triangle
- rect (rectangle)
- quad (quadrilateral, four-sided polygon)
- ellipse
- arc (section of an ellipse)
- curve (Catmull-Rom spline)
- bezier (Bezier curve)

Anatomy of a Function Call

http://processing.org/reference/
Coordinate System

(0, 0) +x
+ y

Pixels

Processing Canvas

size( width, height );
Set the size of the canvas.

background( [0..255] );
Set the background grayscale color.

Drawing Primitives

point( x, y );
line( x1, y1, x2, y2 );
triangle( x1, y1, x2, y2, x3, y3 );
quad( x1, y1, x2, y2, x3, y3, x4, y4 );
rect( x, y, width, height );
ellipse( x, y, width, height );

Colors

Composed of four elements:
1. Red
2. Green
3. Blue
4. Alpha (Transparency)
**Shape Formatting**

1. Fill color
2. Line thickness
3. Line color

*These are properties of your paintbrush, not of the object you are painting.*

---

**Fill Color**

```plaintext
fill(gray);
fill(gray, alpha);
fill(red, green, blue);
fill(red, green, blue, alpha);
noFill();
```

---

**Stroke (Line) Color**

```plaintext
stroke(gray);
stroke(gray, alpha);
stroke(red, green, blue);
stroke(red, green, blue, alpha);
noStroke();
```

---

**ellipseMode**

```plaintext
ellipseMode(CENTER);
ellipse(35, 35, 50, 50);
ellipseMode(CORNER);
fill(102);
ellipse(35, 35, 50, 50);
```

---

**rectMode**

```plaintext
rectMode(CENTER);
rect(35, 35, 50, 50);
rectMode(CORNER);
fill(102);
rect(35, 35, 50, 50);
```

---

**strokeCap**

```plaintext
smooth();
strokeWeight(12.0);
strokeCap(ROUND);
line(20, 30, 80, 30);
strokeCap(SQUARE);
line(20, 50, 80, 50);
strokeCap(PROJECT);
line(20, 70, 80, 70);
```

---

**strokeWeight**

```plaintext
smooth();
strokeWeight(1); // Default
line(20, 40, 80, 40);
strokeWeight(4); // Thicker
line(20, 60, 80, 60);
strokeWeight(10); // Beastly
line(20, 70, 80, 70);
```

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Why 0 .. 255?
Dropbox

- https://www.dropbox.com/