

Art 382: Introduction to Interactive Media

mcdo@umbc.edu

Lecture 19, Ap. 21

Schedule

- Take Roll
- Test 2-- check

Calder's Circus

- 1925: roaring 20's Paris
- Calder was trying to get noticed
- He would go to parties with a suitcase
- His French is awful, he was huge, he was an American mechanical engineer
- <http://www.youtube.com/watch?v=t6jwnu8lzy0&feature=related>

Review

- Variable declarations
 - "var a: int;"
 - makes a variable-- a place to store a number
- assignments
 - a = 2;
 - copies a number from one place to another
- expressions
 - a = b*2;
 - do arithmetic; generally part of an assignment

more review

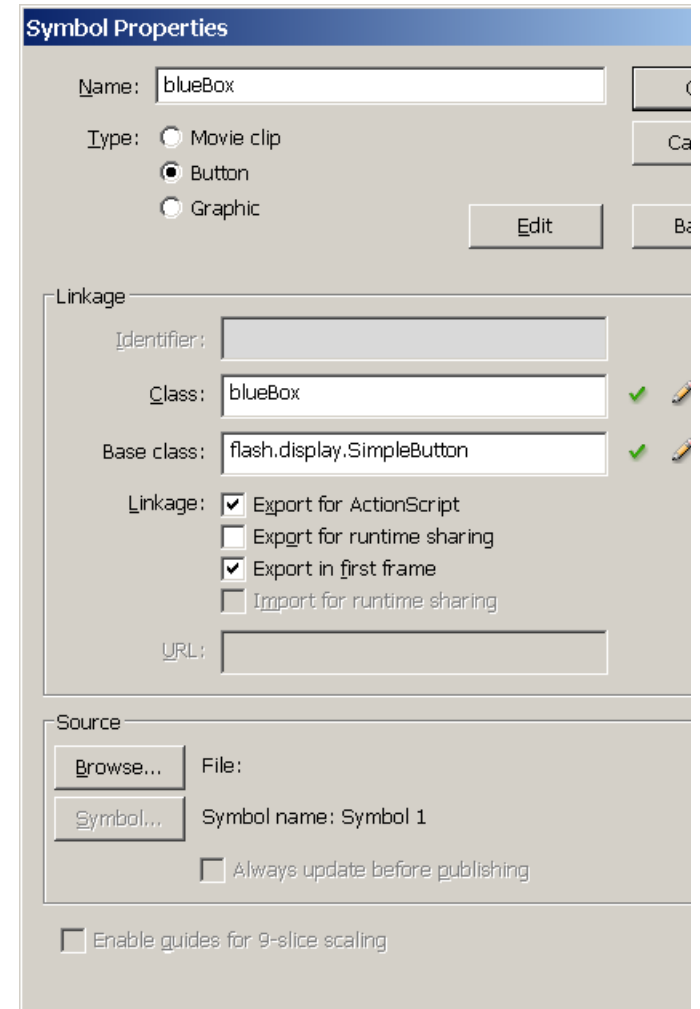
- timeline control
 - gotoAndPlay(20);
 - sets which frame Flash plays next
- conditional statements
 - if (a==20) { c=b; } else { c=d; }
 - depending on the "condition", different statements are executed

then, this! many concepts

```
var i:int;  
graphics.lineStyle(1.5, 0x00ff00, 1);  
  
for (i=0; i<500; i=i+5) {  
    graphics.moveTo(10,10);  
    graphics.lineTo(100,200);  
    graphics.lineTo(300,10+i);  
}
```

Something new

- make a symbol
 - check the "export for ActionScript"
 - allows AS to access it
 - what does that mean?
 - name it "blueBox"
 - make sure "Name" and "Class" match



add this code to frame 1

```
var a: blueBox;  
a = new blueBox();  
addChild(a);  
a.x = 300.0;  
a.y = 300.0;
```

run it: box appears at 300,300-- big deal.

making new variable types

- "a" is a symbol, of a kind that you just made
- CS aside: "a" extends "Sprite"
 - Sprites have a position: x and y
 - many, many other members-- look it up!
 - no, this is not on the test.

"a" is a "blueBox"

- "a" is an instance of your "blueBox" symbol
- "a.x" is the x-coordinate of your "a"
- "a.y" is the y-coordinate of your "a"
- set them to move a
- Dot notation: access to variables that are attached to other variables
 - why would we do that?
 - how would you attach... ?

```
a = new blueBox();
```

- jargon: allocates a new instance of "blueBox"
- you just have to before you use a Sprite
- notice the "()"-- a function call!
 - the "constructor" of the "blueBox" class
 - a function that initializes a "blueBox"
- why don't you have to do this for integers?
 - integers are just single numbers. blueBox is a collection of maybe 100 numbers-- more work

addChild(a);

- "a = new blueBox();" creates a
 - does not add it to the stage
 - AS knows about "bluebox" because you checked the "export" box.
- "addChild(a)" adds a to the stage's rendering hierarchy
 - like dragging from the library to the stage does

Change the code

```
var a:blueBox;  
a = new blueBox();  
addChild(a);  
a.x = Math.random()*300.0;  
a.y = Math.random()*300.0;
```

Remember, "Math" is a collection of functions; Math.random() returns a random number

More changing

- Put a "gotoAndPlay(1)" on frame 2
- Every other frame, a new box in a different place

Another version

- Code on frame 1
 - var a: blueBox;
 - a = new blueBox();
 - addChild(a);
- Code on frame 2
 - a.x = Math.random()*300;
 - a.y = Math.random()*300;
 - gotoAndPlay(2);
- Just 1 box, jumping around

Yet Another Version

- Code on frame 1
 - var a: blueBox;
 - a = new blueBox();
 - addChild(a);
- Code on frame 2
 - a.x = Math.random()*300;
 - a.y = Math.random()*300;
 - gotoAndPlay(1);
- Many boxes, one jumper-- how odd!

What did that do?

- every loop
 - make a box + position it randomly (frame 1)
 - move it once more (frame 2)
- next loop, a is re-initialized with a new box
 - the old box is still there
 - a doesn't refer to it any more!
 - careful with "new"-- it changes what a names!
 - (jargon: "memory leak" -- bad!)

Version 4

- Code on frame 1
 - var a, b: blueBox;
 - a = new blueBox();
 - b = new blueBox();
 - addChild(a);
 - addChild(b);
- Code on frame 2
 - a.x = Math.random()*300;
 - for a.y, b.x, b.y -- just the same
 - gotoAndPlay(2);

Version 5

- Code on frame 1
 - `var a, b, c, d: blueBox;`
 - `a = new blueBox();`
 - `b = new blueBox();`
 - `c = new blueBox();`
 - `d = new blueBox();`
 - `addChild(a); addChild(b);`
 - `addChild(c); addChild(d);`
- Code on frame 2
 - `a.x = Math.random()*300;`

Version 6

```
var a:Array;
a = new Array(300);
var i:int;
for (i=0; i<300; i=i+1) {
    a[i] = new blueBox();
    a[i].x = Math.random()*300;
    a[i].y = Math.random()*300;
    addChild(a[i]);
}
```

Arrays

- single variables that hold lists
- lists can be numbered, or they can be "associative", which we're not getting into
- numbering starts at 0
- use brackets to refer to individual elements

`a[0] = 1; // sets the first element of a to 1`

`a[i] = 14; // sets different elements; depends on
// the value of i`

arrays+loops

- the bacon and biscuits of programming
- operations on mighty piles of data
 - particle systems
 - database operations
- any time you have multiple similar things

look closely

```
for (i=0; i<300; i=i+1) {  
    a[i] = new blueBox();  
}
```

- for loop, repeats 300 times
- i starts at 0, increases by one each time
- a is a list of 300 things
- a[i] is the ith element of a
- first time thru: a[0]. second time: a[1] ...