

Getting Started in Java

CIS 110

Your First Program

A screenshot of an Integrated Development Environment (IDE) showing a Java file named `HelloWorld.java`. The code contains a simple `Hello World` application:

```
1 public class HelloWorld {  
2     public static void main(String[] args) {  
3         System.out.println("Hello, World");  
4     }  
5 }  
6
```

The IDE has a toolbar with standard file operations (New, Open, Save, Close, Cut, Copy, Paste, Undo, Redo, Find, Compile, Reset, Run, Test, Javadoc). Below the toolbar is a code editor window. At the bottom of the IDE interface, there are tabs for Interactions, Console, and Compiler Output. The Compiler Output tab shows the message "Compilation completed.". To the right of the compiler output is a panel titled "Compiler" with a dropdown menu set to "JDK 6.0_51" and a checked checkbox for "Highlight source". The status bar at the bottom indicates "Editing /Users/bjbrown/introcs/HelloWorld.java" and the time "2:9".



Section 1.1

Your First Program

Program Name

The screenshot shows a Java development environment with the following details:

- Title Bar:** /Users/bjbrown/introcs /HelloWorld.java
- File Content:** A Java code snippet for a "Hello World" application.

```
1 public class HelloWorld
2     public static void main(String[] args) {
3         System.out.println("Hello, World");
4     }
5 }
```
- Toolbars:** Standard Mac OS X-style toolbar with New, Open, Save, Close, Cut, Copy, Paste, Undo, Redo, Find, Compile, Reset, Run, Test, and Javadoc.
- Compiler Output:** Shows "Compilation completed."
- Compiler Settings:** Set to "JDK 6.0_51".
- Source Code Options:** "Highlight source" is checked.
- Status Bar:** Editing /Users/bjbrown/introcs/HelloWorld.java and 2:9.

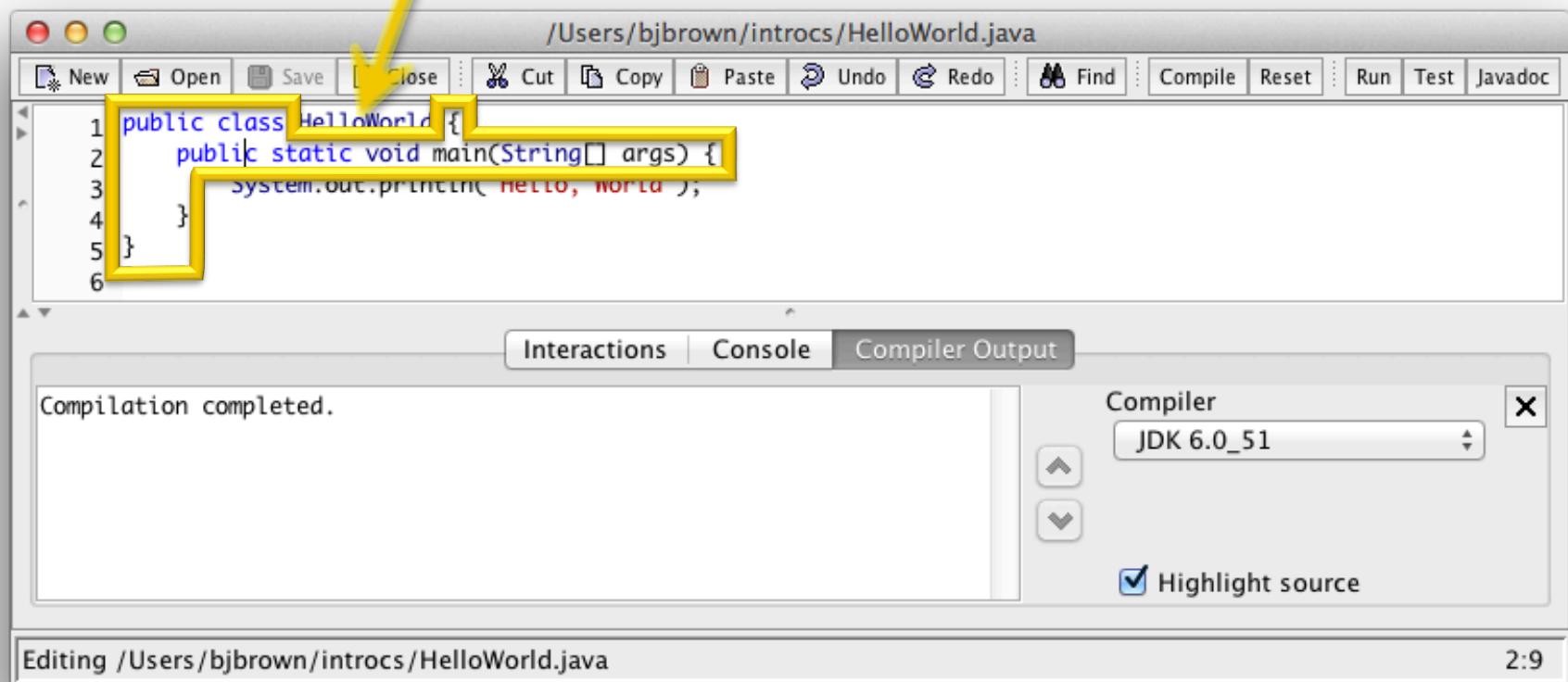
Two yellow arrows point from the "Program Name" text above to the title bar and the class name in the code editor.



Section 1.1

Your First Program

Scaffolding



A screenshot of a Java IDE interface. The title bar reads "/Users/bjbrown/introcs/HelloWorld.java". The menu bar includes New, Open, Save, Close, Cut, Copy, Paste, Undo, Redo, Find, Compile, Reset, Run, Test, and Javadoc. The main editor area contains the following Java code:

```
1 public class HelloWorld {  
2     public static void main(String[] args) {  
3         System.out.println("Hello, World");  
4     }  
5 }  
6
```

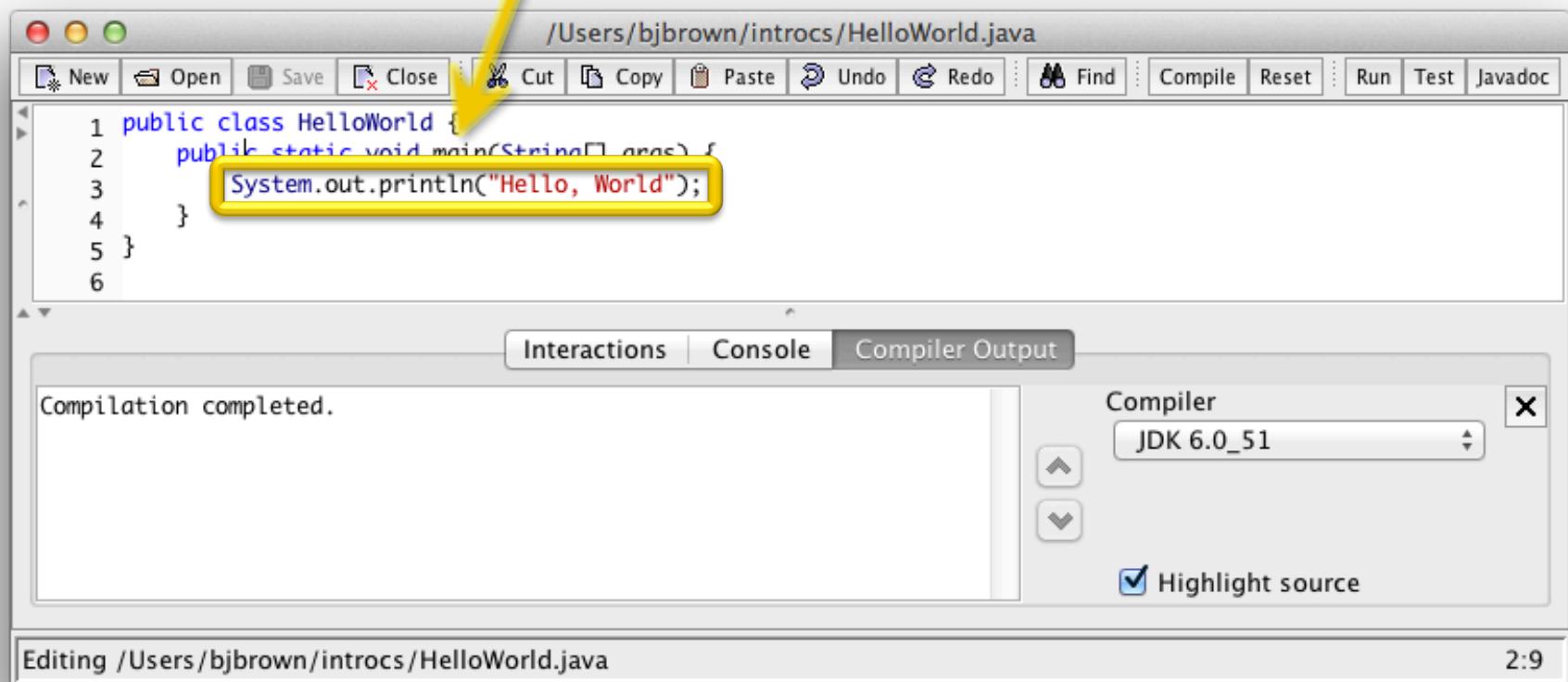
The first two lines of code are highlighted with a yellow box and a yellow arrow points from the word "Scaffolding" to this box. Below the editor is a tab bar with Interactions, Console, and Compiler Output, with Compiler Output selected. The console pane shows "Compilation completed.". The compiler settings show "JDK 6.0_51" and a checked "Highlight source" option. The status bar at the bottom indicates "Editing /Users/bjbrown/introcs/HelloWorld.java" and the time "2:9".



Section 1.1

Your First Program

Print the text "Hello, World".



A screenshot of a Java IDE interface. The title bar shows the file path: /Users/bjbrown/introcs/HelloWorld.java. The menu bar includes New, Open, Save, Close, Cut, Copy, Paste, Undo, Redo, Find, Compile, Reset, Run, Test, and Javadoc. The main editor window contains the following Java code:

```
1 public class HelloWorld {  
2     public static void main(String[] args) {  
3         System.out.println("Hello, World");  
4     }  
5 }  
6
```

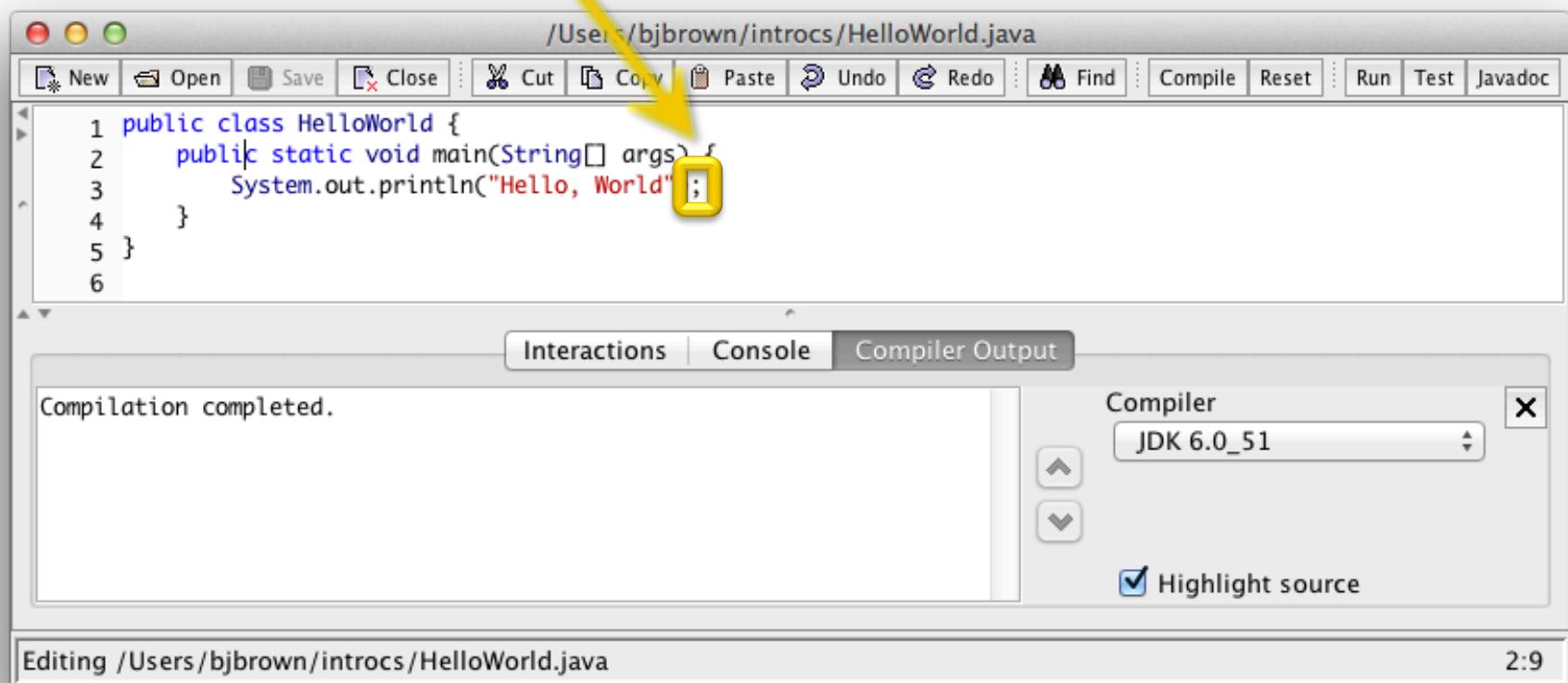
A yellow arrow points to the line `System.out.println("Hello, World");`. Below the editor, there are tabs for Interactions, Console, and Compiler Output. The Compiler Output tab shows the message "Compilation completed.". To the right, a Compiler settings panel shows "JDK 6.0_51" selected and a checked checkbox for "Highlight source". The status bar at the bottom indicates "Editing /Users/bjbrown/introcs/HelloWorld.java" and the time "2:9".



Section 1.1

Your First Program

Statements end with a ;



A screenshot of an IDE interface. The title bar shows the file path: /Users/bjbrown/introcs/HelloWorld.java. The menu bar includes New, Open, Save, Close, Cut, Copy, Paste, Undo, Redo, Find, Compile, Reset, Run, Test, and Javadoc. The main editor window contains the following Java code:

```
1 public class HelloWorld {  
2     public static void main(String[] args) {  
3         System.out.println("Hello, World");  
4     }  
5 }  
6
```

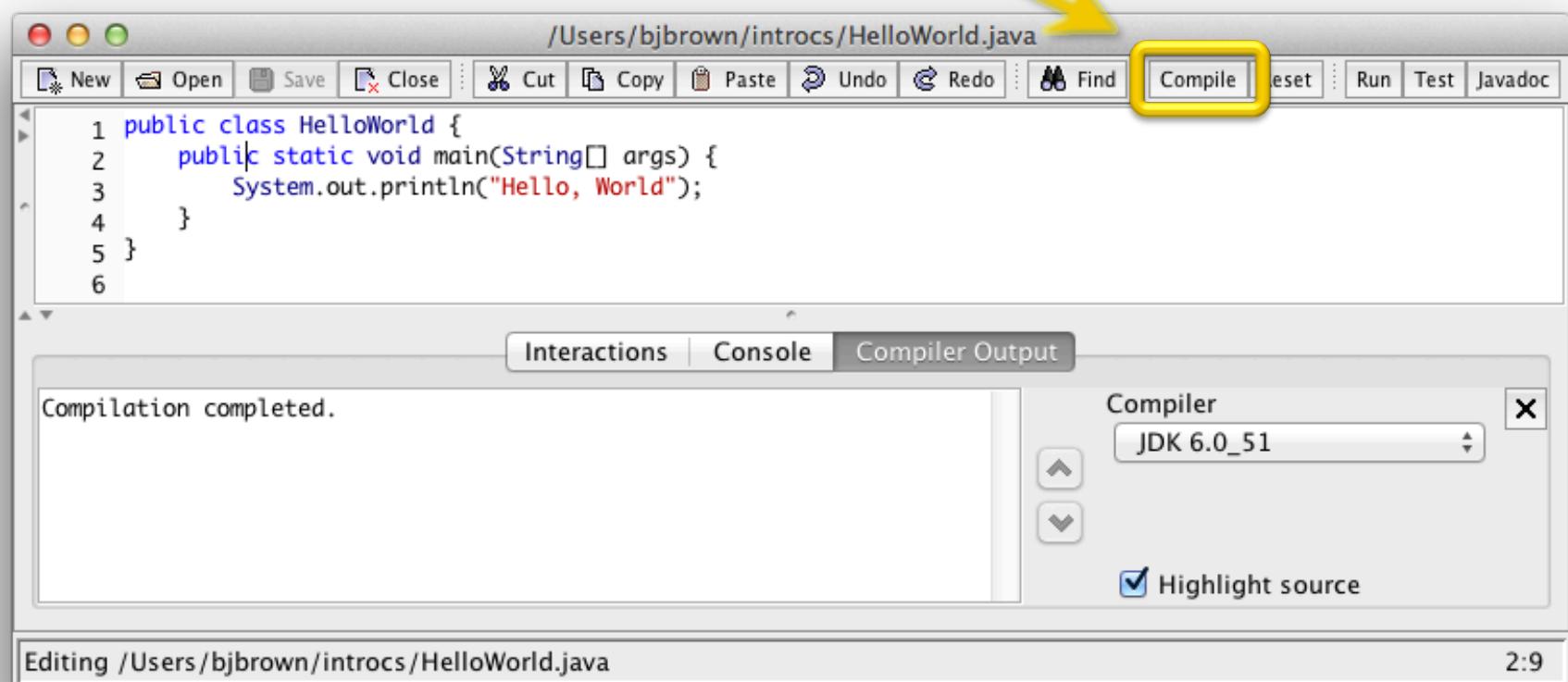
A yellow arrow points from the text "Statements end with a ;" to the semicolon character in the line "System.out.println("Hello, World");". Below the editor is a toolbar with tabs for Interactions, Console, and Compiler Output, with the Compiler tab selected. The status bar at the bottom indicates "Editing /Users/bjbrown/introcs/HelloWorld.java" and the time "2:9".



Section 1.1

Your First Program

**Compile to translate
to machine code**



A screenshot of an IDE interface. The title bar shows the file path: /Users/bjbrown/introcs/HelloWorld.java. The menu bar includes New, Open, Save, Close, Cut, Copy, Paste, Undo, Redo, Find, Compile, Reset, Run, Test, and Javadoc. A yellow arrow points to the 'Compile' button in the menu bar. The code editor displays the following Java code:

```
1 public class HelloWorld {  
2     public static void main(String[] args) {  
3         System.out.println("Hello, World");  
4     }  
5 }  
6
```

The bottom left of the interface shows the message "Compilation completed." The bottom right contains a "Compiler" dropdown set to "JDK 6.0_51" and a checked checkbox for "Highlight source". The status bar at the bottom indicates "Editing /Users/bjbrown/introcs/HelloWorld.java" and the time "2:9".



Section 1.1

Your First Program

Run the compiled program

The screenshot shows the DrJava IDE interface. At the top, the title bar displays the file path: /Users/bjbrown/introcs/HelloWorld.java. Below the title bar is a menu bar with standard options: New, Open, Save, Close, Cut, Copy, Paste, Undo, Redo, Find, Compile, Reset, Run, Test, and Javadoc. The 'Run' button is highlighted with a yellow box and has a yellow arrow pointing towards it from the text above. The main workspace contains the Java code for 'HelloWorld':

```
1 public class HelloWorld {  
2     public static void main(String[] args) {  
3         System.out.println("Hello, World");  
4     }  
5 }  
6
```

Below the code, there is a tab bar with three tabs: 'Interactions' (which is highlighted with a yellow box), 'Console', and 'Compiler Output'. The 'Interactions' tab displays the following session:

```
Welcome to DrJava. Working directory is /Users/bjbrown/introcs  
> run HelloWorld  
Hello, World  
>
```

At the bottom of the window, a status bar shows the message 'Running main Method of Current Document' and the time '2:9'.



Section 1.1

Why Java?

 Java	<pre>public class Hello_World { public static void main(String[] args) { System.out.println("Hello, World."); } }</pre>
 C/C++	<pre>#include <stdio.h> int main(int argc, char** argv) { printf("Hello, World.\n"); return 0; }</pre>
 Matlab	<pre>disp('Hello, World.)</pre>
 JavaScript	<pre>document.write("Hello, World.");</pre>
 Fortran	<pre>PROGRAM HELLO PRINT *, 'Hello, World.' END</pre>
 OCaml	<pre>print_endline "Hello, World."</pre>
 Lisp	<pre>(princ "Hello, World.")</pre>
 sh	<pre>echo Hello, World.</pre>
 Logo	<pre>print [Hello, World.]</pre>

"There are only two kinds of [programming] languages: the ones people complain about and the ones nobody uses." - Bjarne Stroustrup

Java is:

- Widely used
- Practical for many problems
- Includes most modern language abstractions



x86 Assembly

```
.model tiny  
.code  
.org 100h  
  
main proc  
    mov    ah,9  
    mov    dx,offset hello_message  
    int    21h  
    retn  
  
hello_message db 'Hello, world.$'  
main endp  
end main
```

Your computer
speaks this

Computational Art

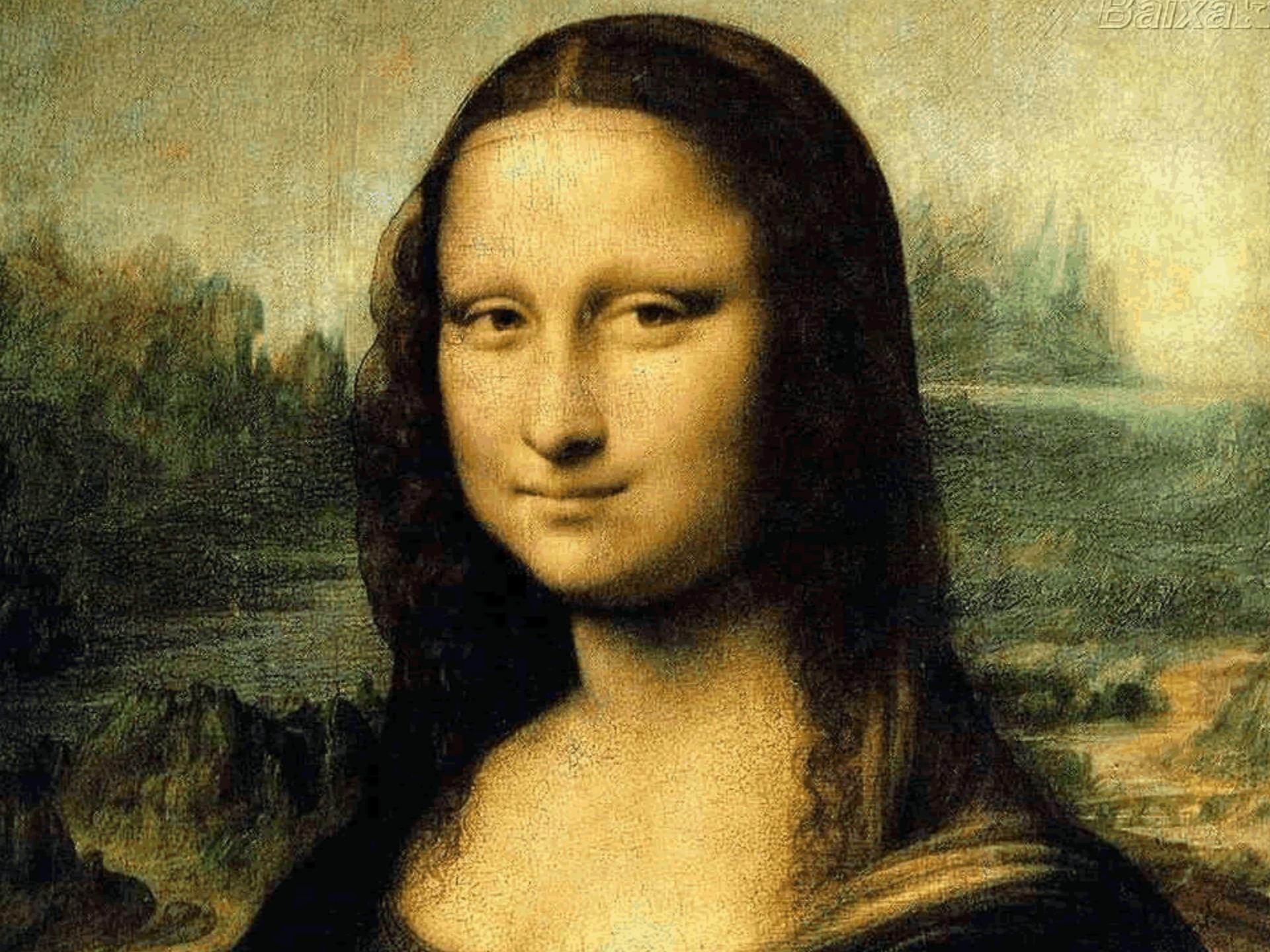
Examples

Protopypes by Ira Greenberg



Shepard Fairey



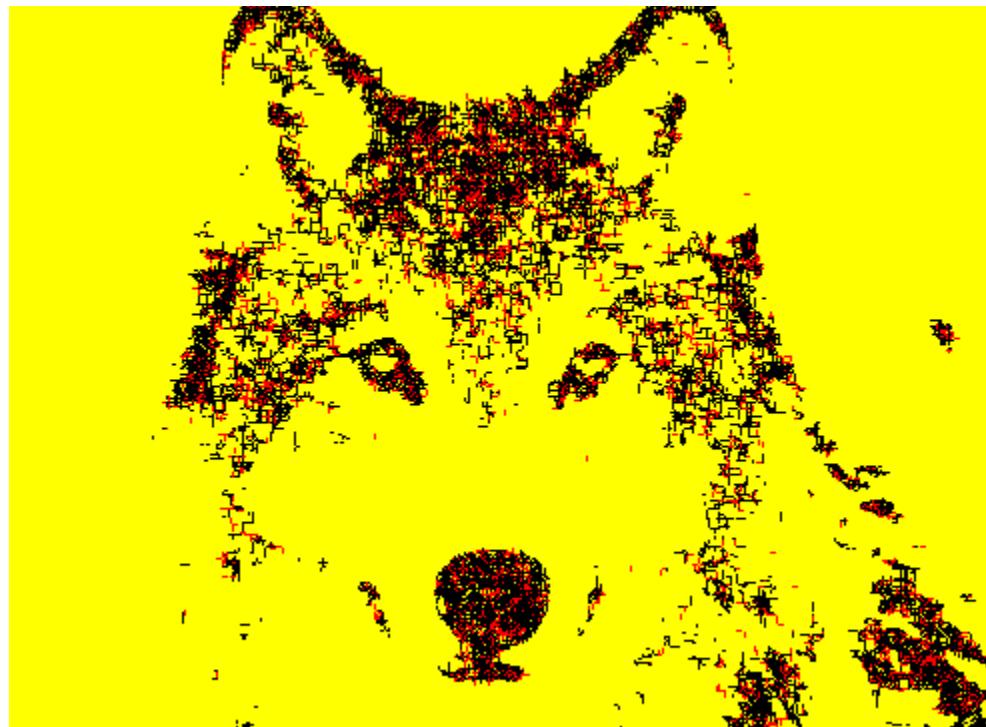


Balkan





Abstract Art



Procedural Art



More Procedural Art

 **MATHEMATICA**
& Wolfram Language

Home Questions Tags Users Unanswered

How do I draw a pair of buttocks?

Asked 5 years, 6 months ago Active 3 years, 11 months ago Viewed 146k times

287 I'm trying to develop a function which 3D plot would have a buttocks like shape.

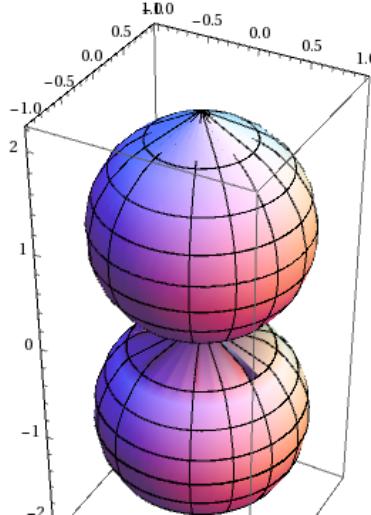
Several days of searching the web and a dozen my of own attempts to solve the issue have brought nothing but two pitiful formulas below.

They have some resemblance to the shape I want, though not quite.

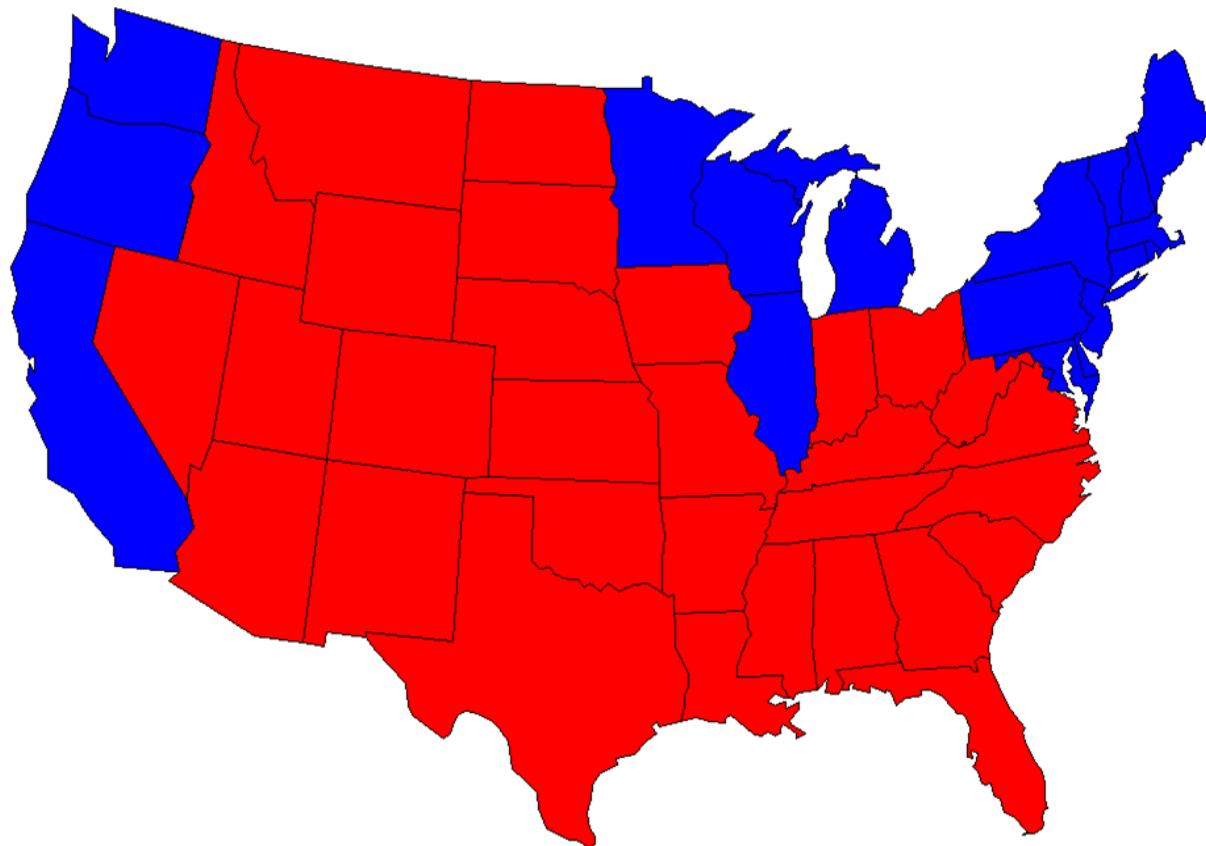
157 Could you help me to obtain a proper formula?

Here are those bad solutions I've got myself:

```
ParametricPlot3D[{Sin[y] Sqrt[1 - (Abs[x] - 1)^2],  
Cos[y] Sqrt[1 - (Abs[x] - 1)^2], x}, {x, -10, 10}, {y, -3 Pi, 3 Pi},  
AspectRatio -> Automatic]
```



Red & Blue States



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

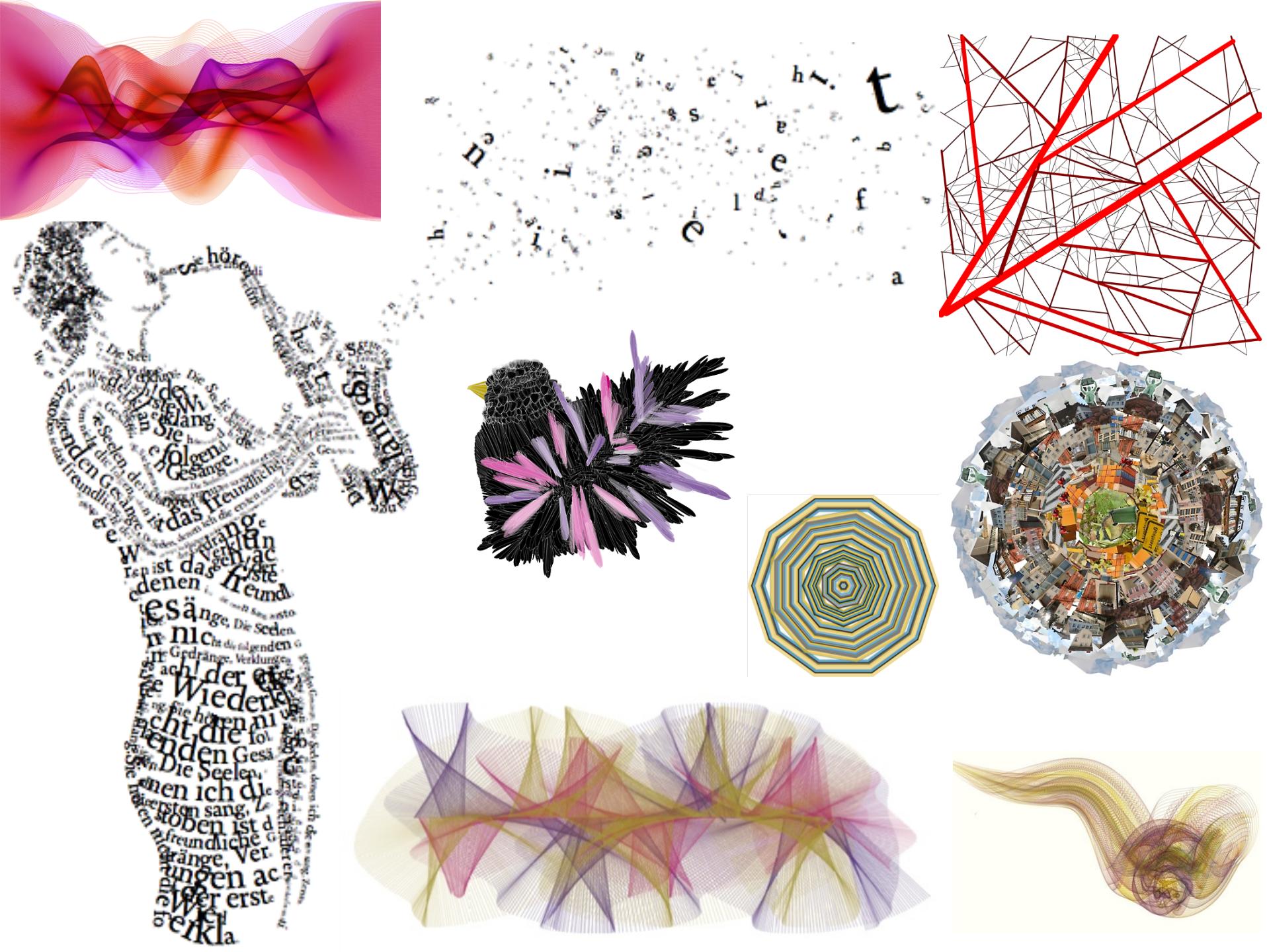
Summertime,
And the livin' is easy
Fish are jumpin'
And the cotton is high

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

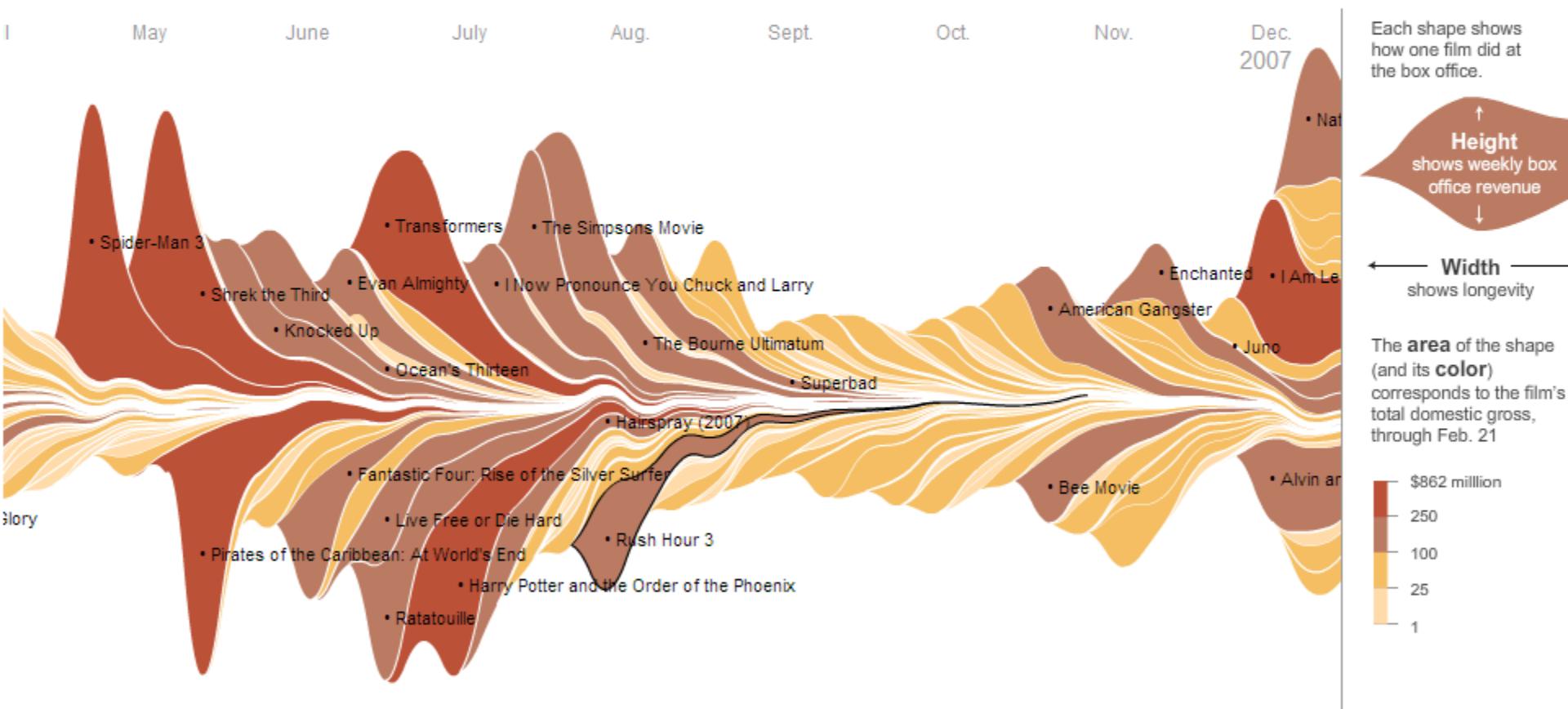
Word Cloud



Created using: wordle.net



Box Office Earnings



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

Drawing in Java Using the PennDraw Library: MyHouse.java

CIS 110

Explanatory Comment

```
10 public class MyMouse {  
11     public static void main(String[] args) {  
12         // set the size of the window to 500 pixels by 500 pixels  
13         PennDraw.setCanvasSize(500, 500);  
14  
15         PennDraw.clear(PennDraw.BLUE); // draw a blue sky
```

Your Textbook: Replace
StdDraw with **PennDraw**

PennDraw is “StdDraw 2.0”

Set Window Size

```
10 public class MyHouse {  
11     public static void main(String[] args) {  
12         // set the size of the window to 500 pixels by 500 pixels  
13         PennDraw.setCanvasSize(500, 500);  
14  
15         PennDraw.clear(PennDraw.BLUE); // draw a blue sky
```

Color the entire window blue

```
10 public class MyHouse {  
11     public static void main(String[] args) {  
12         // set the size of the window to 500 pixels by 500 pixels  
13         PennDraw.setCanvasSize(500, 500);  
14  
15         PennDraw.clear(PennDraw.BLUE); // draw a blue sky
```

Comment indicates *purpose*

Can replace BLUE with BLACK, CYAN, DARK_GRAY,
GRAY, GREEN, LIGHT_GRAY, MAGENTA, ORANGE,
PINK, RED, WHITE, or YELLOW

Color the entire window blue

```
10 public class MyHouse {  
11     public static void main(String[] args) {  
12         // set the size of the window to 500 pixels by 500 pixels  
13         PennDraw.setCanvasSize(500, 500);  
14  
15         PennDraw.clear(PennDraw.BLUE); // draw a blue sky
```

Comment indicates *purpose*

Set the color to grass green

17
18
19

```
// draw a green field
PennDraw.setPenColor(0, 170, 0);
PennDraw.filledRectangle(0.5, 0.25, 0.6, 0.3);
```

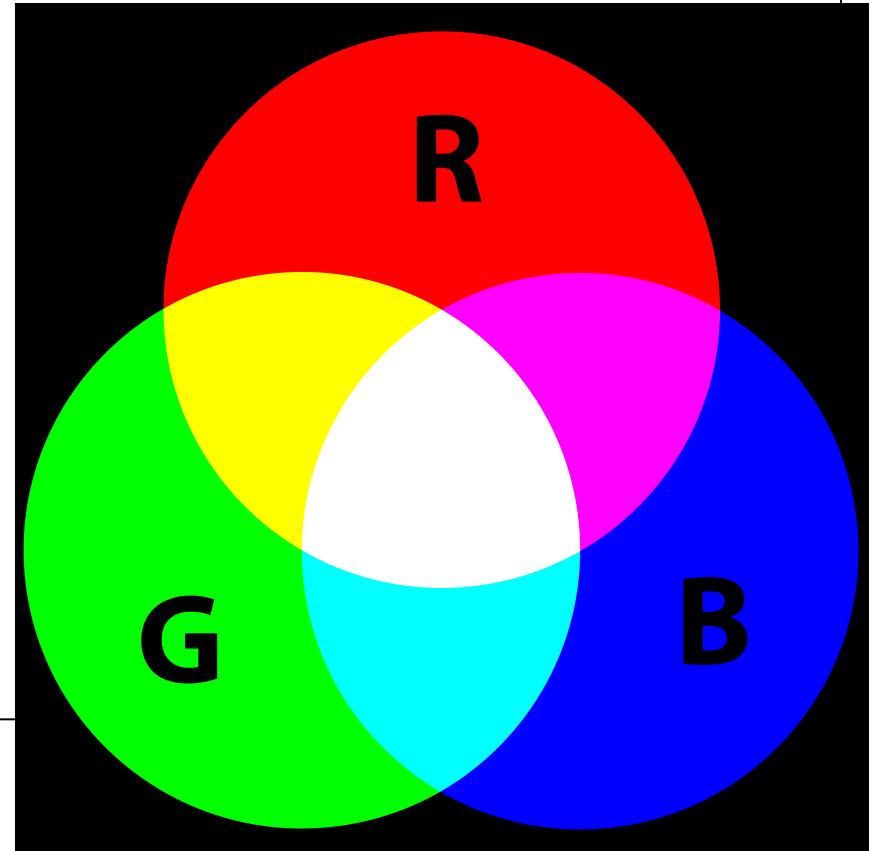


Colors

Composed of three elements:

1. Red
2. Green
3. Blue

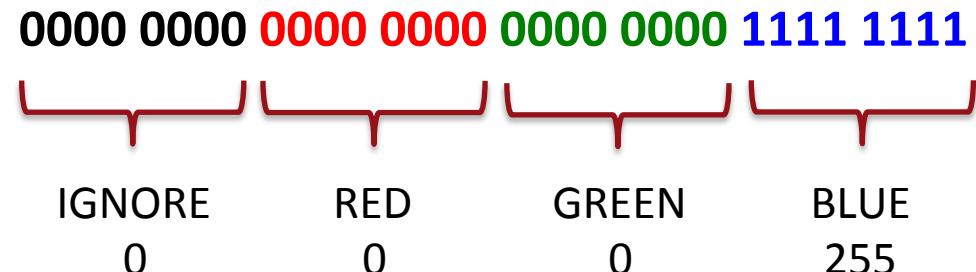
Values from 0 .. 255



Why 0 ... 255?

Decimal	Binary
0	00000000
1	00000001
2	00000010
3	00000011
4	00000100
5	00000101
6	00000110
7	00000111
8	00001000
9	00001001
10	00001010
11	00001011
12	00001100
13	00001101
14	00001110
15	00001111
16	00010000
17	00010001
18	00010010
...	...
255	11111111

Each color is represented by 32 bits:



Notice there are 8 bits per color component.

The maximum value (all 1's) that can be represented in 8 bits is 255 in decimal.

Therefore, the range for each color component is 0 (off) ... 255 (full).

Set the color to grass green

17
18
19

```
// draw a green field
PennDraw.setPenColor(0, 170, 0);
PennDraw.filledRectangle(0.5, 0.25, 0.6, 0.3);
```



Solid rectangle

17
18
19

```
// draw a green field
PennDraw.setPenColor(0, 170, 0);
PennDraw.filledRectangle(0.5, 0.25, 0.6, 0.3);
```

17
18
19

```
// draw a green field
PennDraw.setPenColor(0, 170, 0);
PennDraw.filledRectangle(0.5, 0.25, 0.6, 0.3)
```

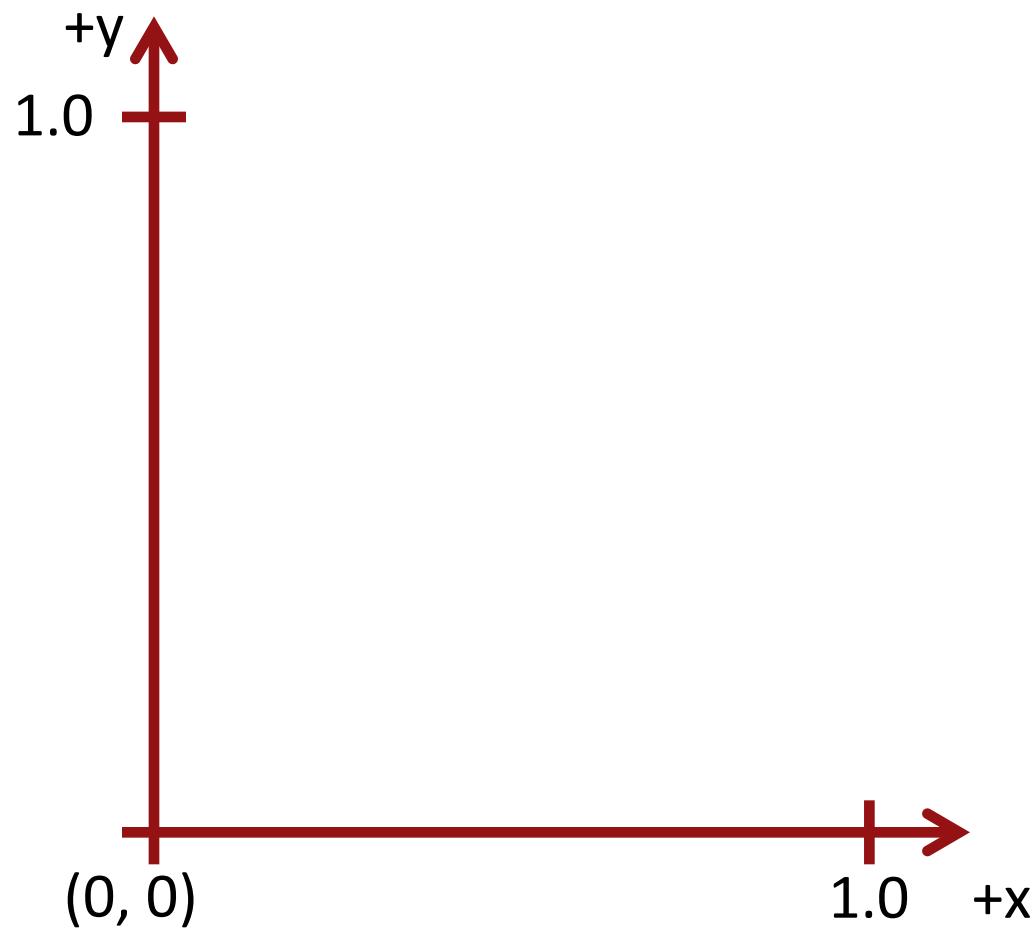
y center

half height

x center

half width

Coordinate System



Draw a solid triangle with corners
at (0.255, 0.7), (0.745, 0.7), (0.49, 0.9)



23

```
PennDraw.filledPolygon(0.255, 0.7, 0.745, 0.7, 0.49, 0.9);
```

Set line thickness (default is 0.002)



26

```
PennDraw.setPenRadius(0.005); // thicken the pen for outline drawing
```

Draw a rectangle outline



34

```
PennDraw.rectangle(250 / 500.0, 260 / 500.0, 120 / 500.0, 90 / 500.0);
```