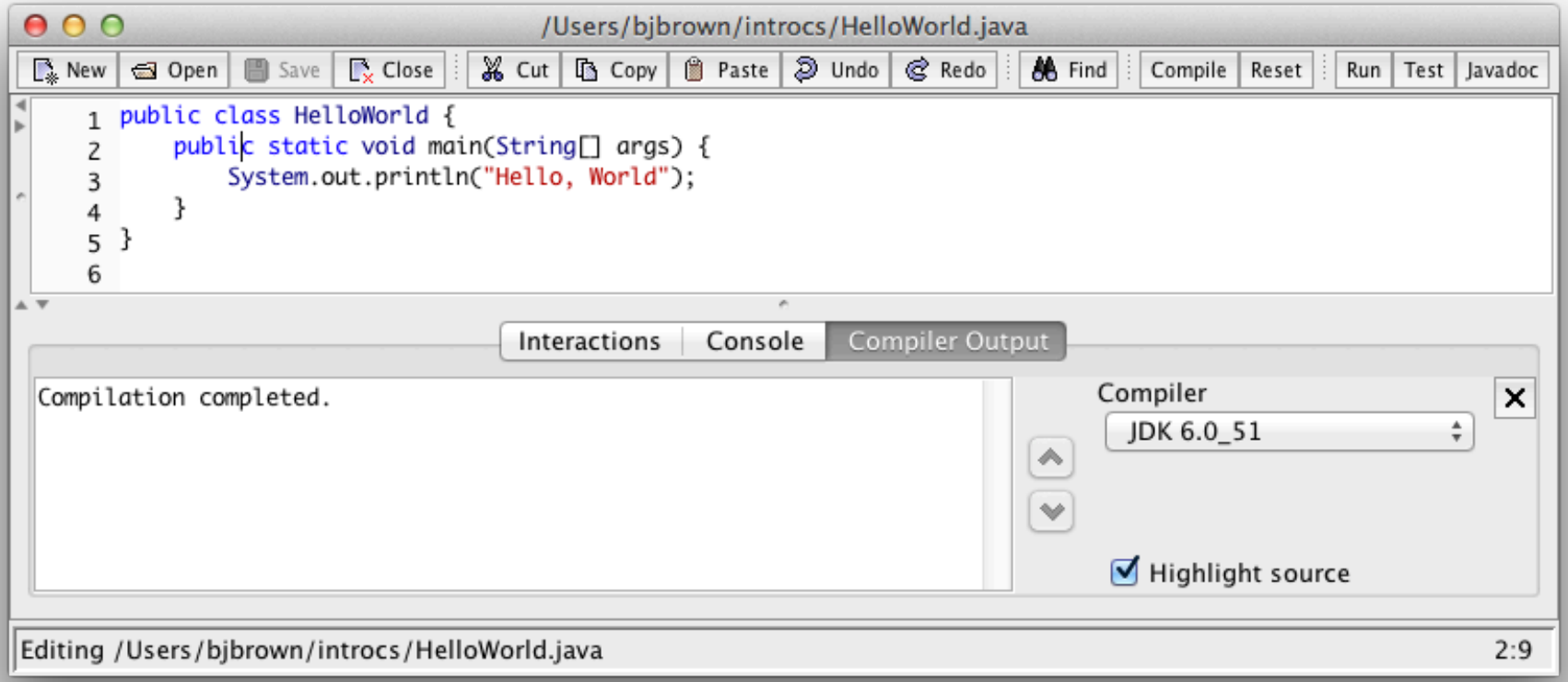
Getting Started in Java

CIS 110

Penn Engineering

Your First Program



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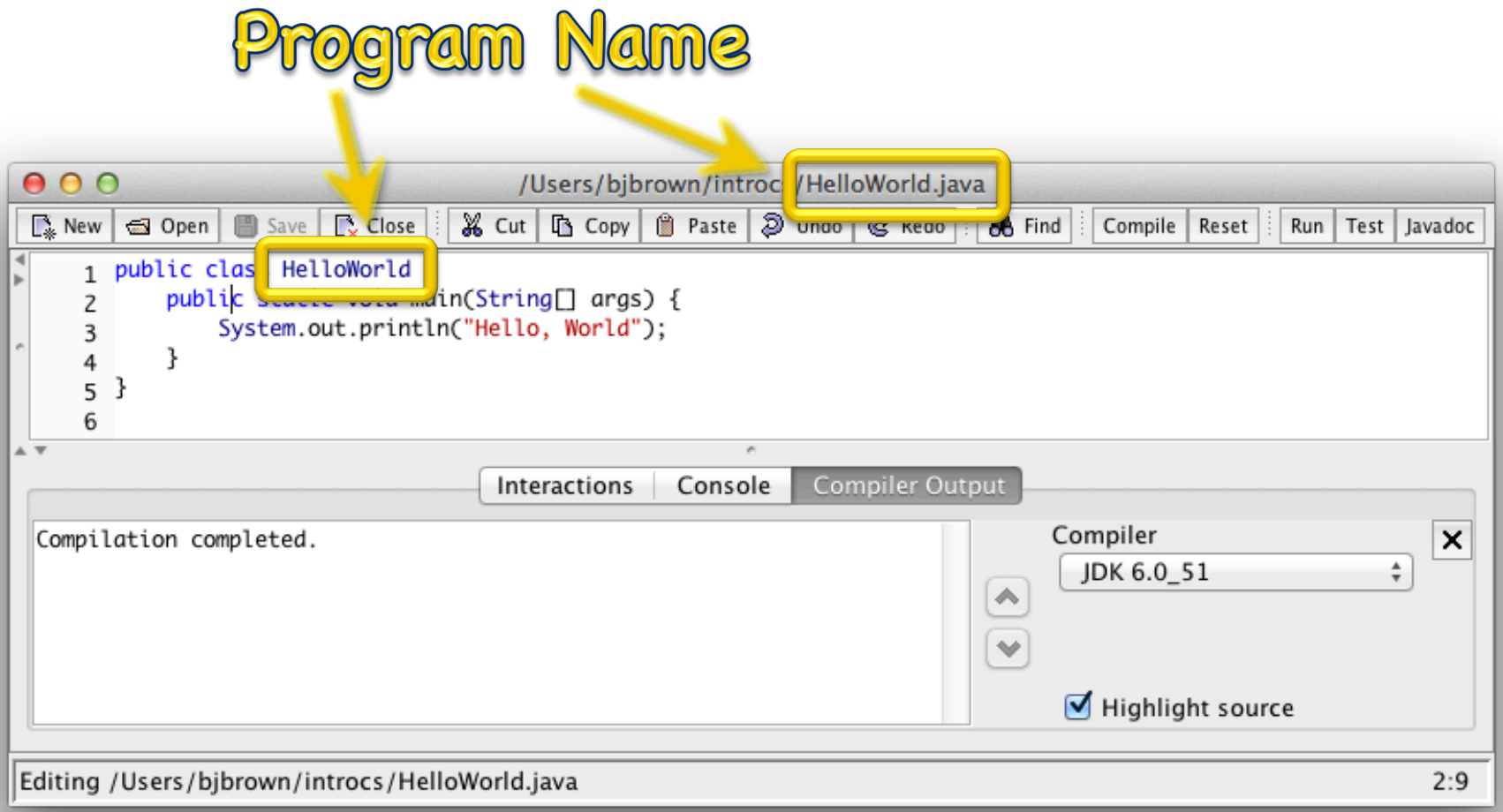
Introduction to Programming in Java

Section 1.1

Your First Program



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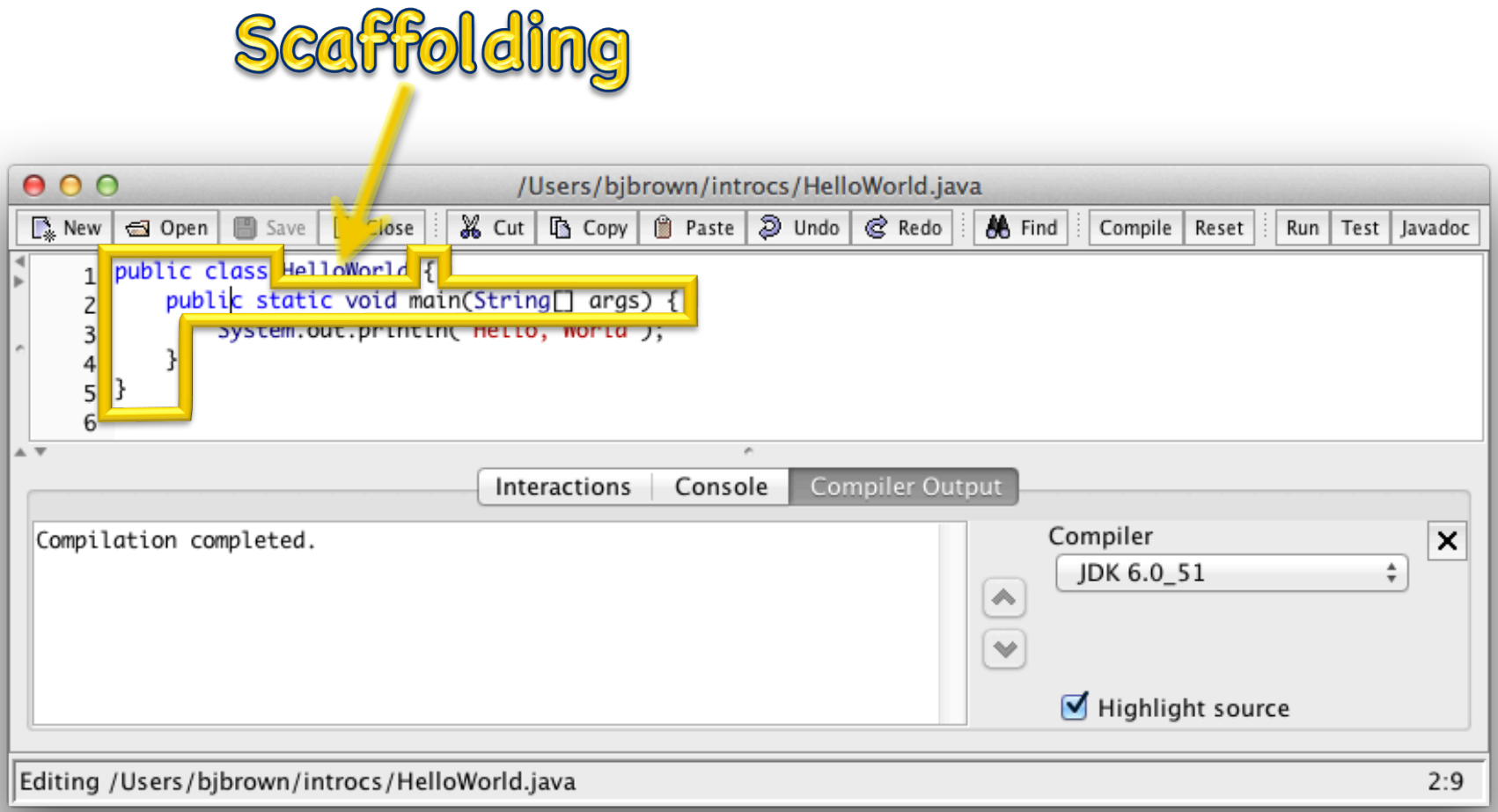
Introduction to Programming in Java

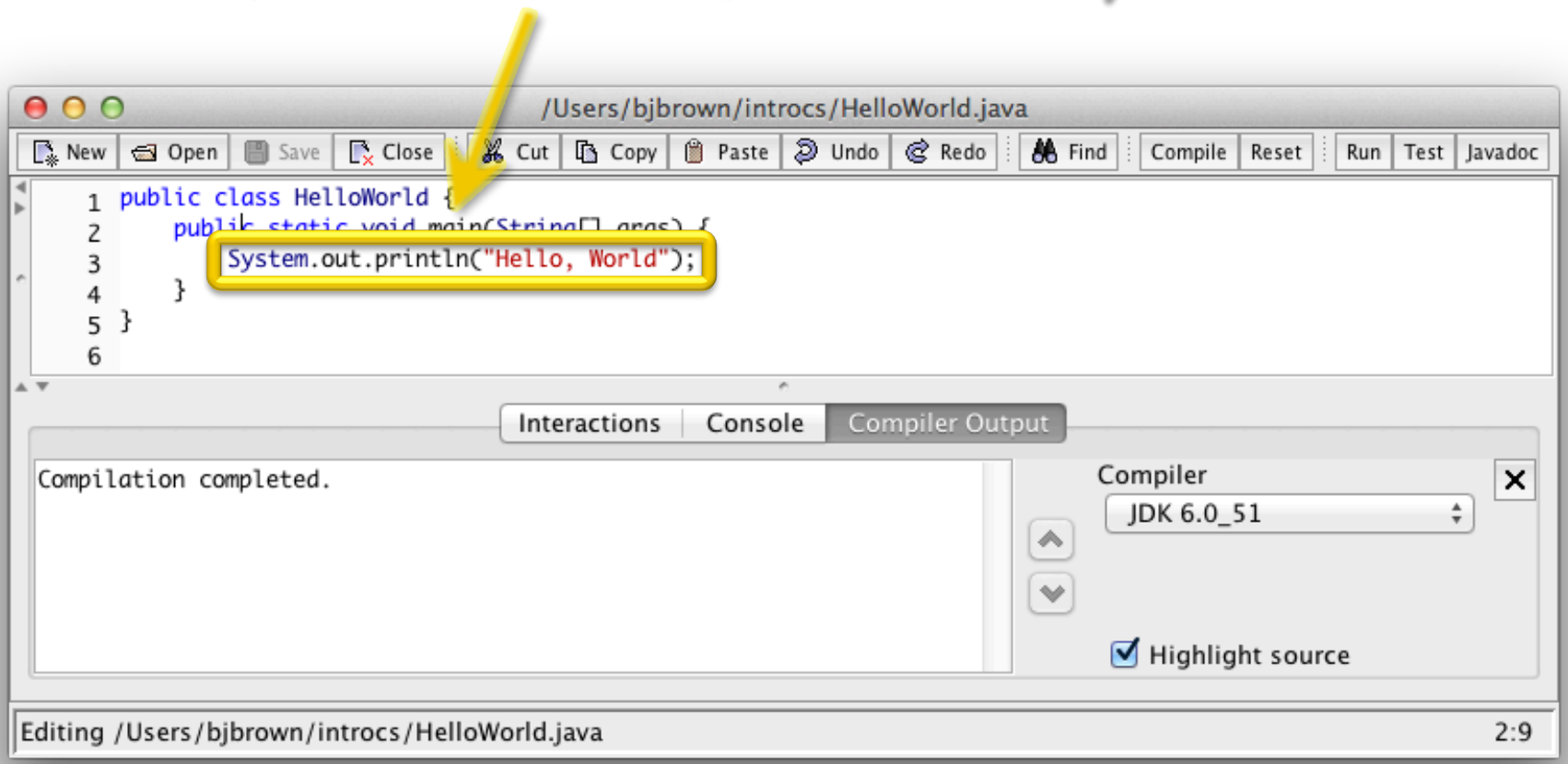
Section 1.1

Your First Program



Your First Program

Print the text "Hello, World".



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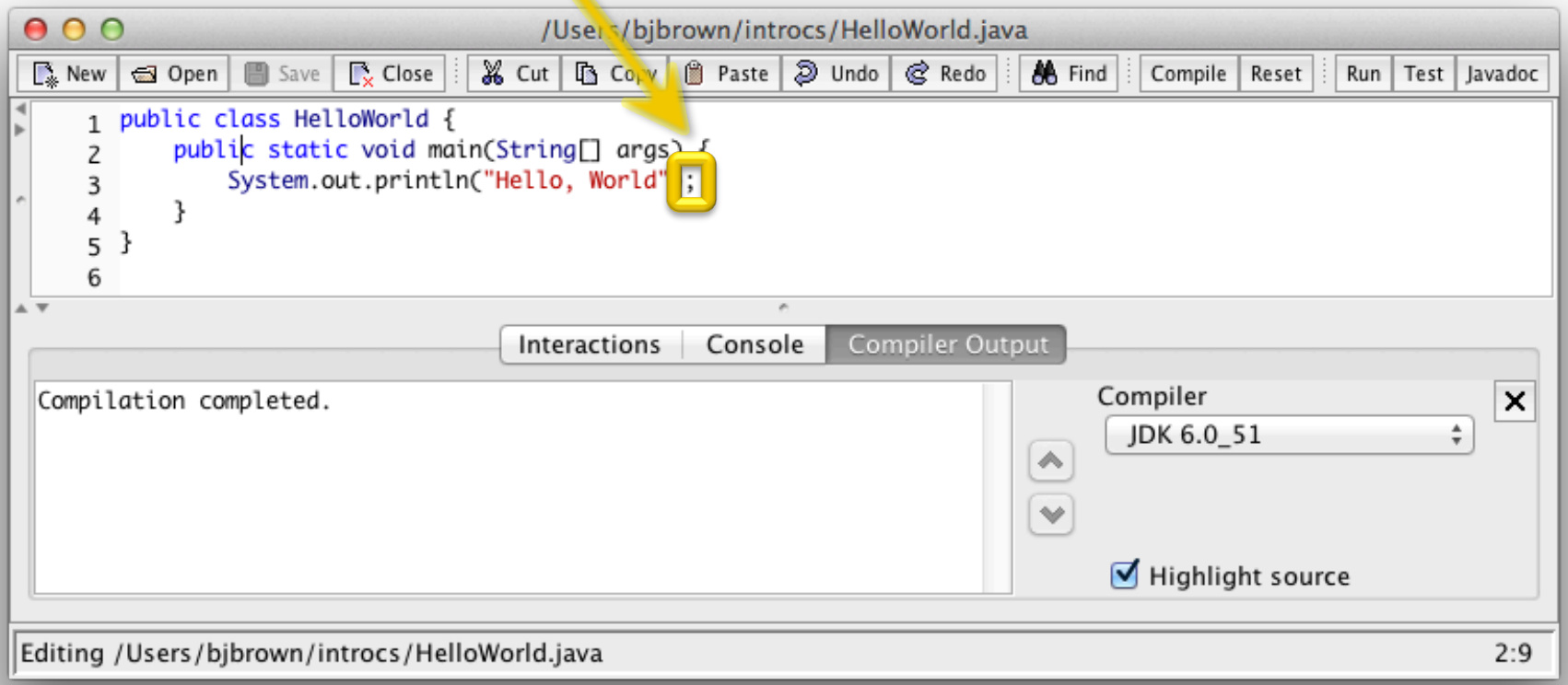
Introduction to Programming in Java

Section 1.1

Your First Program

Statements end with a ;



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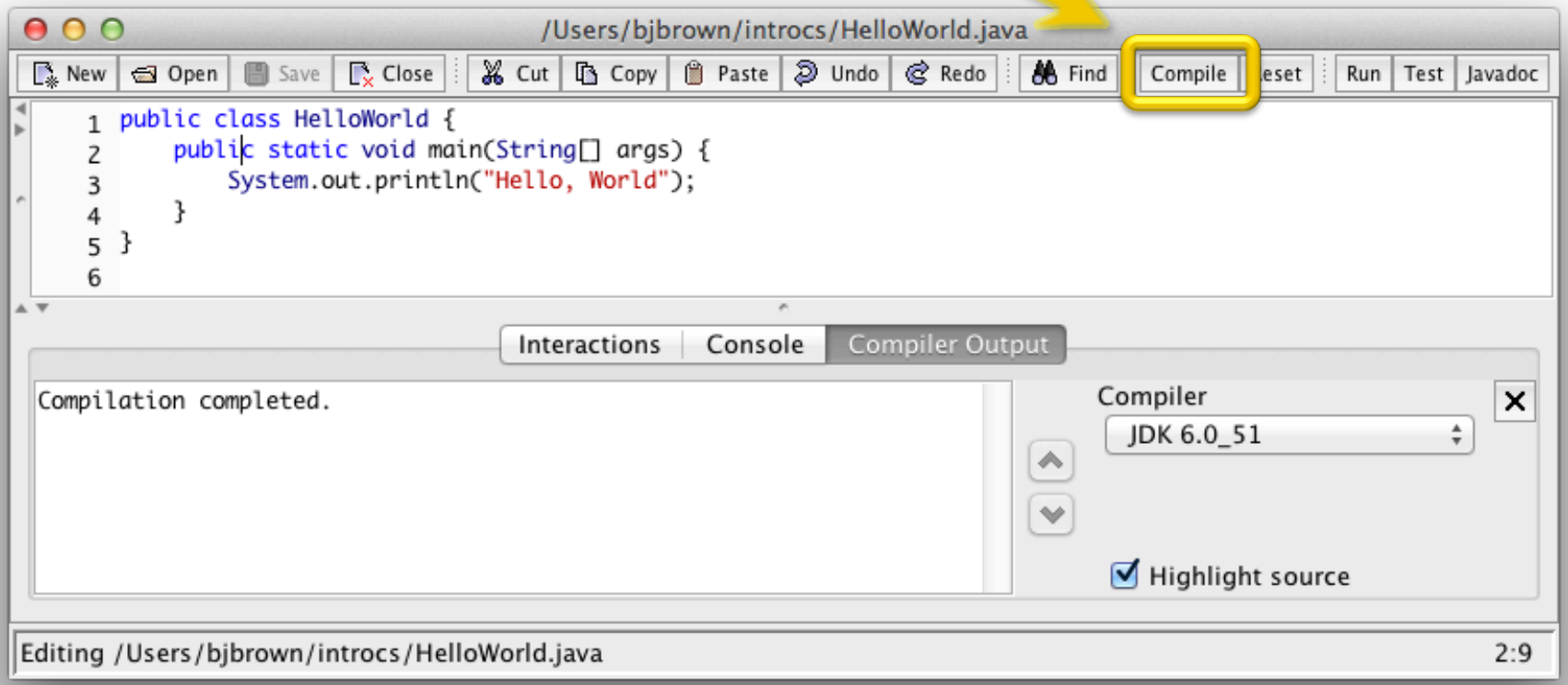
Section 1.1

Your First Program

Compile to translate to machine code



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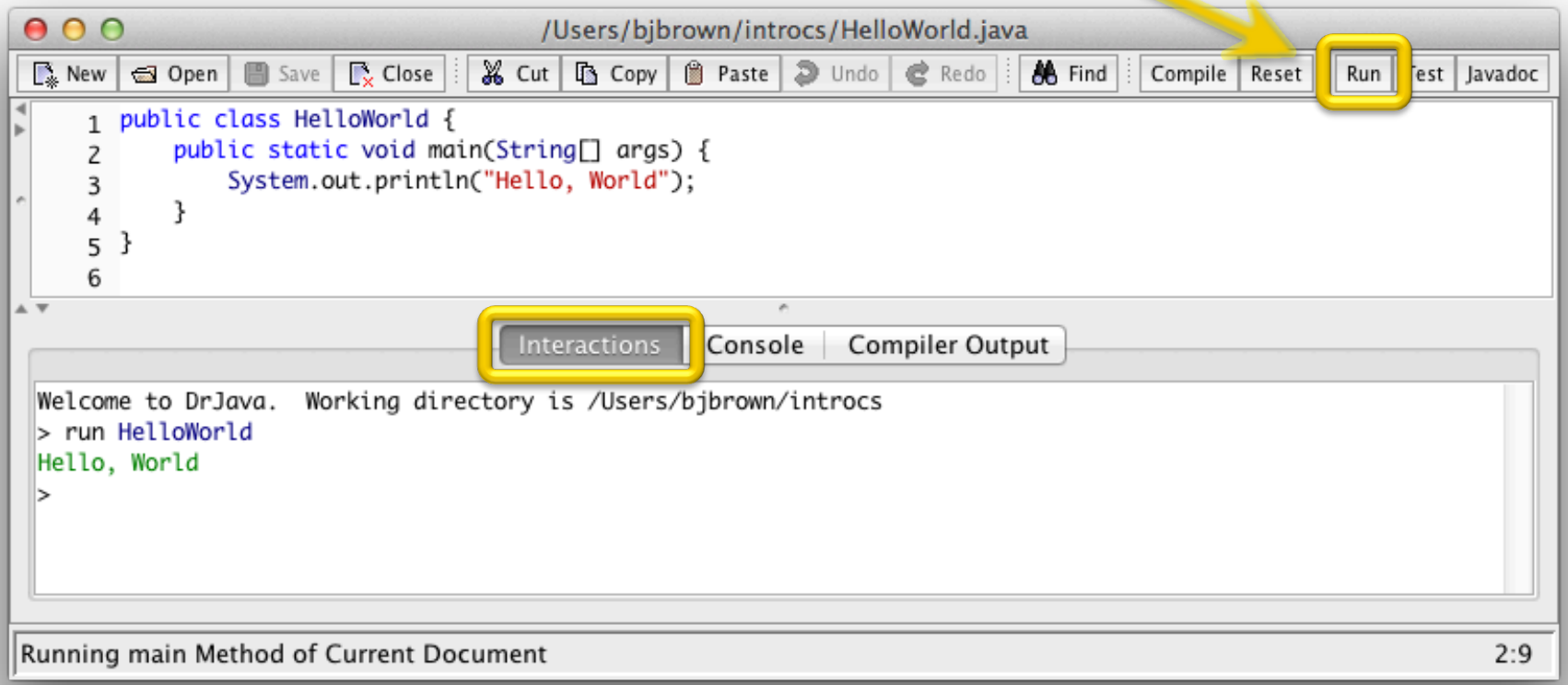
Introduction to Programming in Java

Section 1.1

Your First Program

Run the compiled program



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Introduction to Programming in Java

Section 1.1

Why Java?

Java

```
public class Hello World {
    public static void main(String[] args) {
        System.out.println("Hello, World.");
    }
}
```

C/C++

```
#include <stdio.h>

int main(int argc, char** argv) {
    printf("Hello, World.\n");
    return 0;
}
```

Matlab

```
disp('Hello, World.)
```

JavaScript

```
document.write("Hello, World.");
```

Fortran

```
PROGRAM HELLO
PRINT *, 'Hello, World.'
END
```

OCaml

```
print_endline "Hello, World."
```

Lisp

```
(princ "Hello, World.")
```

sh

```
echo Hello, World.
```

Logo

```
print [Hello, World.]
```

"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

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Protobytes by Ira Greenberg

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Shepard Fairey

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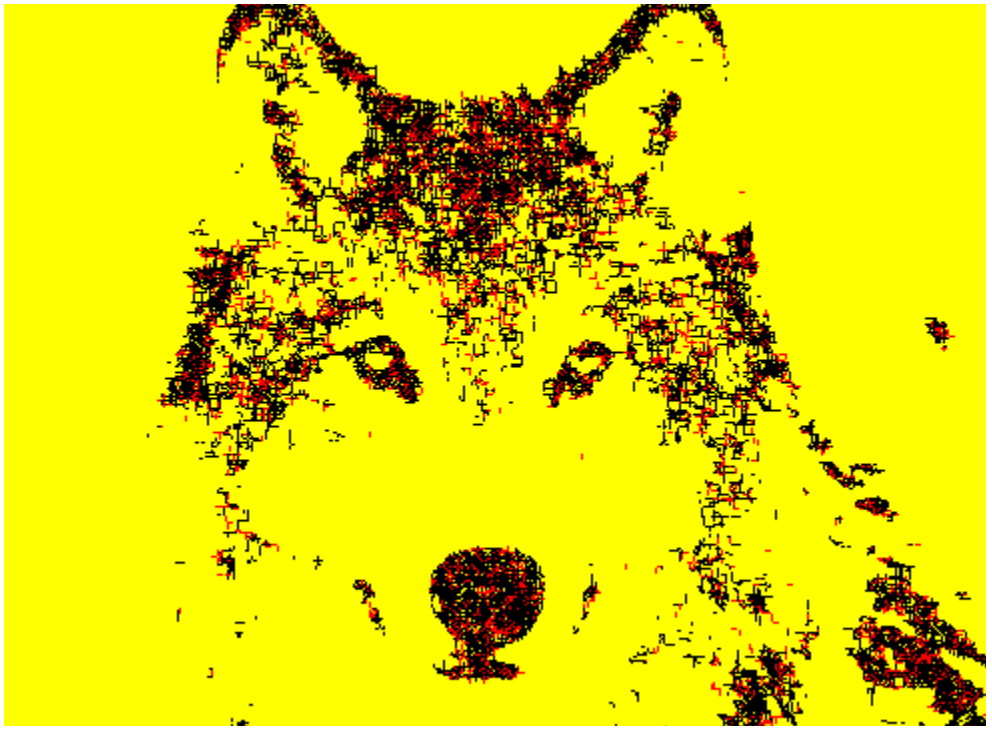
Baikal-1

Abstract Art



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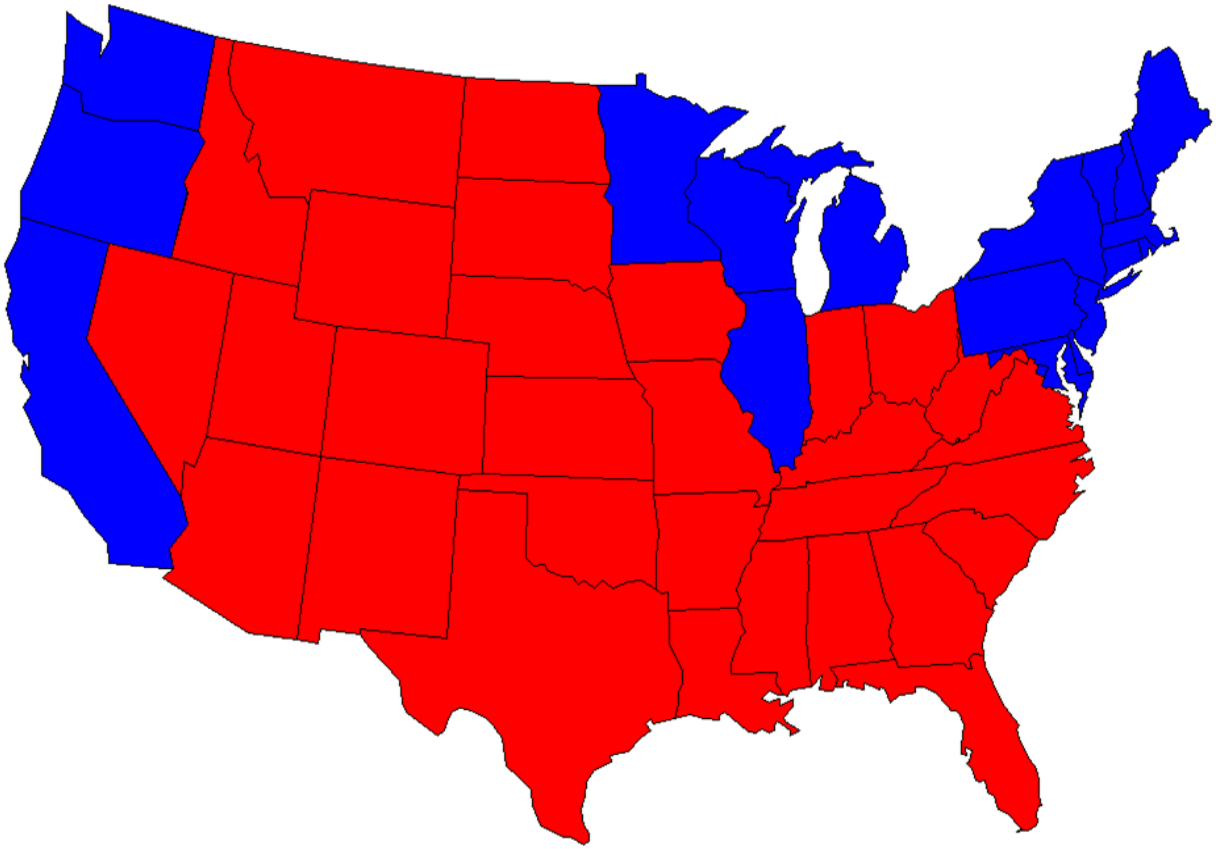
Red & Blue States



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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

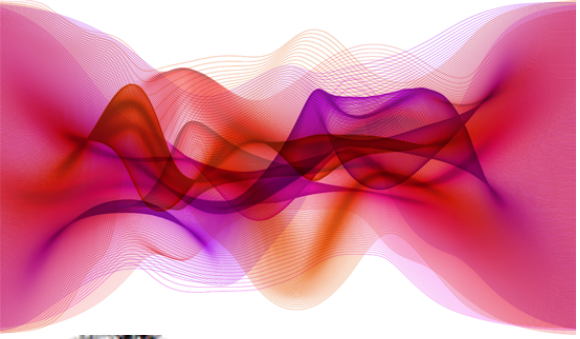
Summertime,
And the livin' is easy
Fish are jumpin'
And the cotton is high

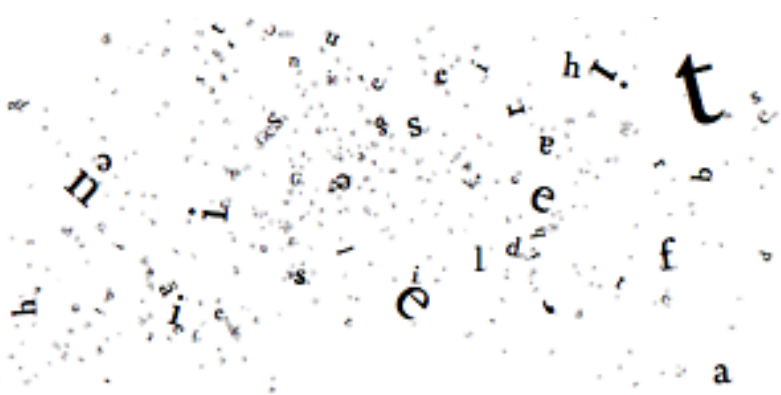
Your daddy's rich
And your mamma's good lookin'
So hush little baby
Don't you cry

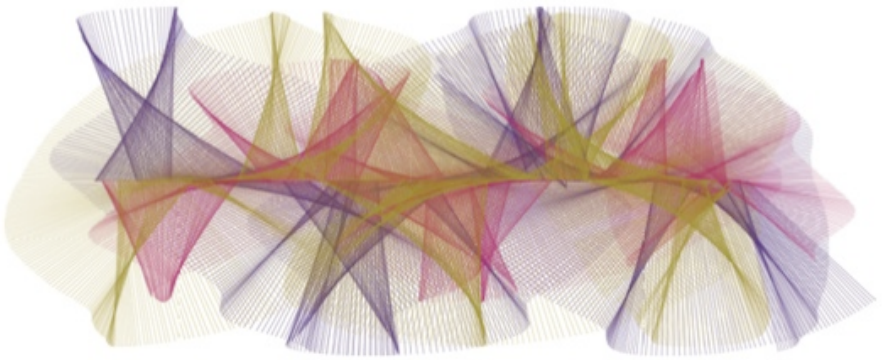
Lyrics by George Gershwin

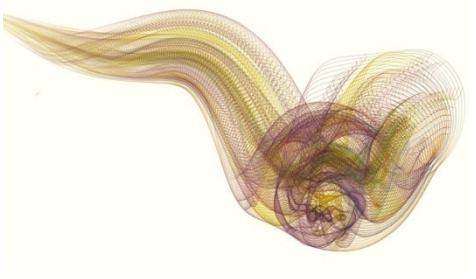
Word Cloud

Created using: wordle.net

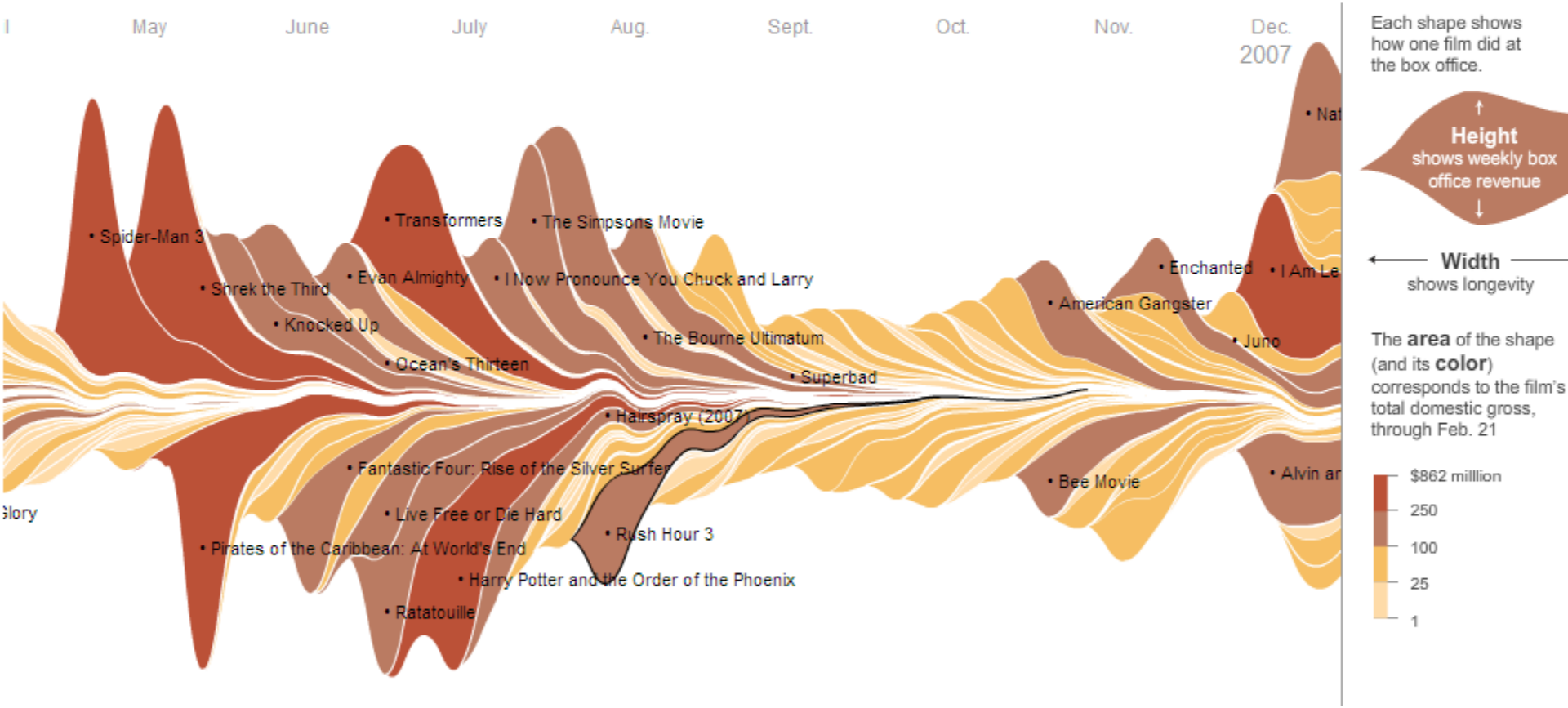








Box Office Earnings



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

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Drawing in Java Using the PennDraw Library: MyHouse.java

CIS 110

Penn Engineering

Explanatory Comment

```
10 public class My[illegible]ouse {
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"

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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
```

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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*

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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);
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Comment indicates *purpose*

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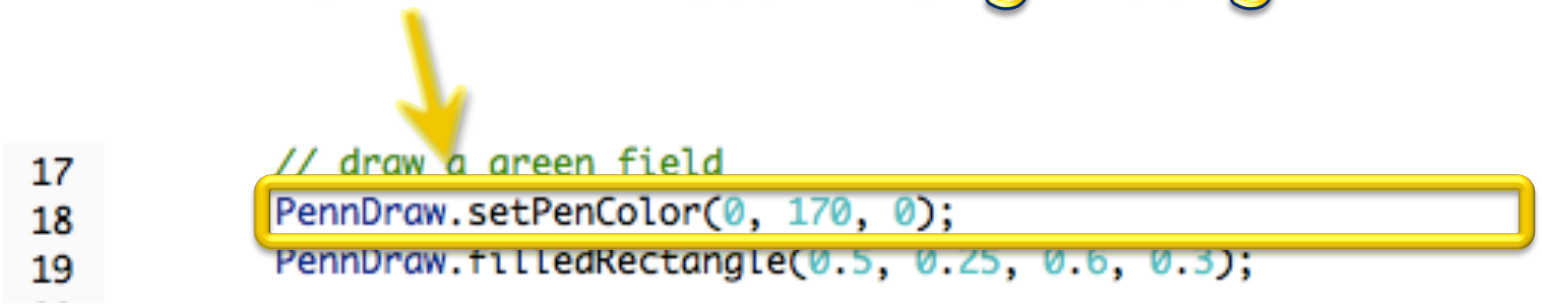
Set the color to grass green



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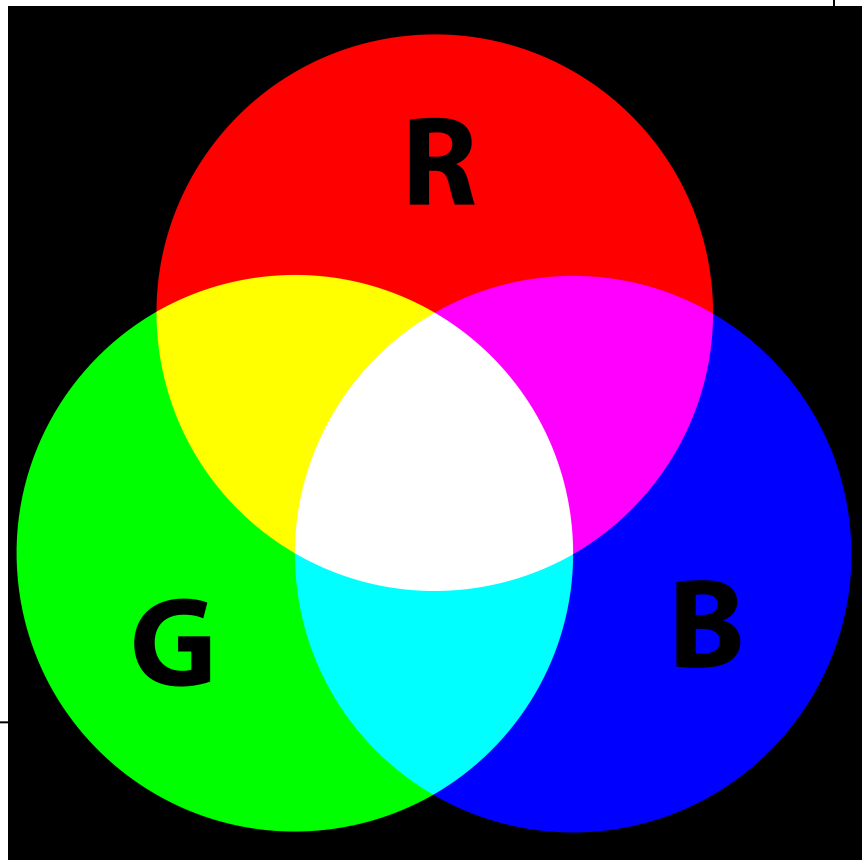
Colors

Composed of three elements:

1. Red
2. Green
3. Blue

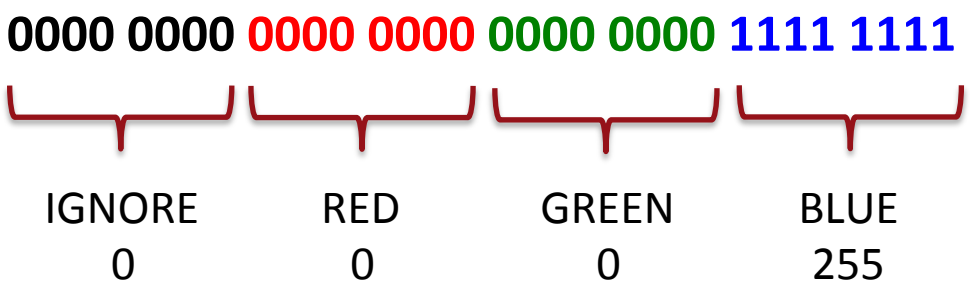
Values from 0 .. 255



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

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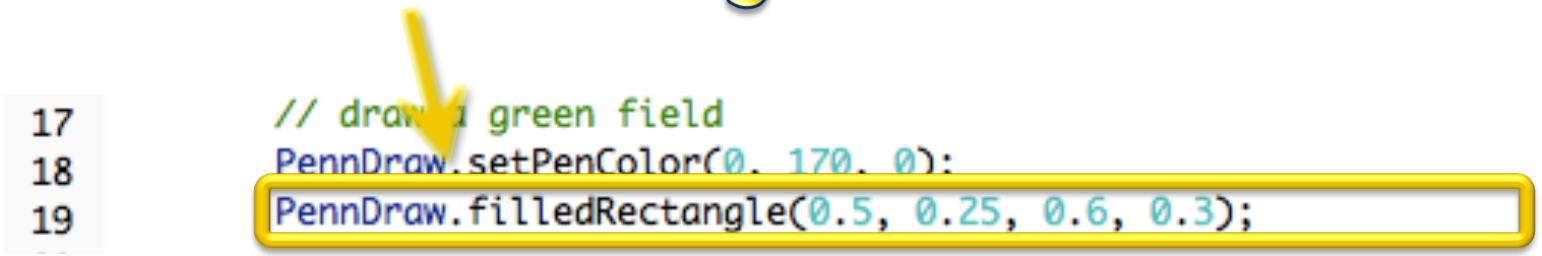
Solid rectangle



```
17  // draw a green field
18  PennDraw.setPenColor(0, 170, 0);
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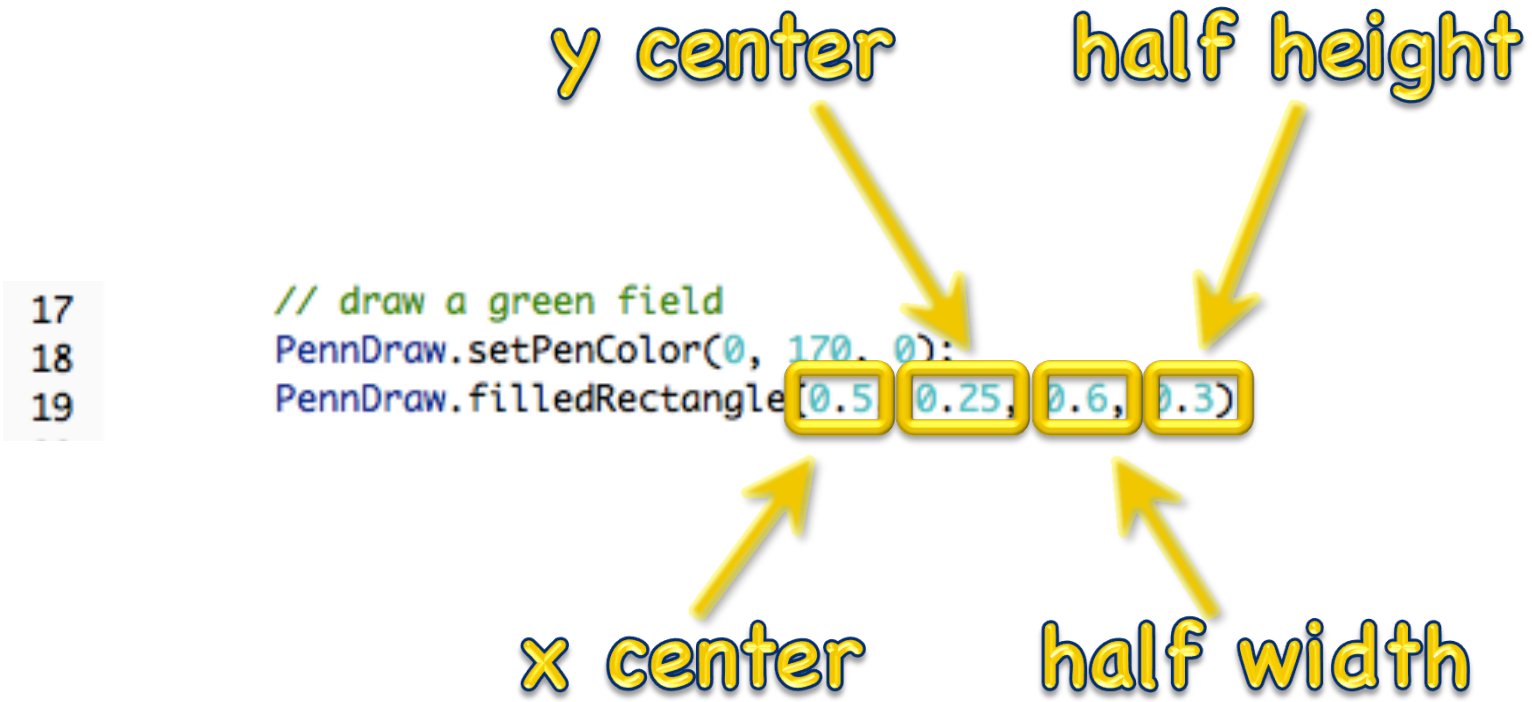
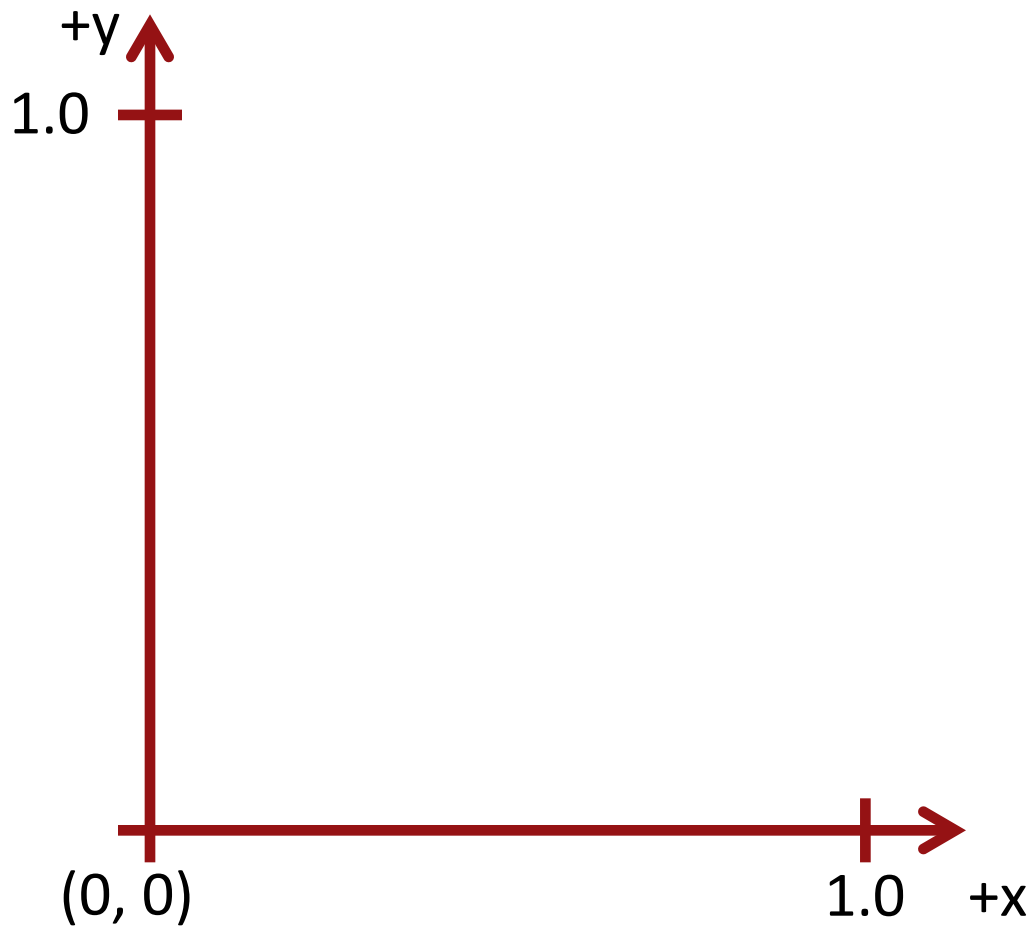
```


y center
half height
17 // draw a green field
18 PennDraw.setPenColor(0, 170, 0);
19 PennDraw.filledRectangle(0.5, 0.25, 0.6, 0.3)
x center
half width

Coordinate System



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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);
```

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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);
```

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