Getting Started in Java

CIS 110
Your First Program

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

Compilation completed.

Section 1.1
Your First Program
Your First Program

Scaffolding

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

Section 1.1
Your First Program

Print the text "Hello, World".

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

Statements end with a ;

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

Compile to translate to machine code

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

Section 1.1
Your First Program

Run the compiled program

Section 1.1
Why Java?

Java

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

C/C++

```c
#include <stdio.h>

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

Matlab

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

JavaScript

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

Fortran

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

OCaml

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

Lisp

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

sh

```sh
echo Hello, World.
```

Logo

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

Java is:

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

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

Your computer speaks this

```
.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
```
Computational Art

Examples
Protobytes by Ira Greenberg
Shepard Fairey
Abstract Art
Red & Blue States
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
Box Office Earnings

nytimes.com
February 23, 2008
Drawing in Java Using the PennDraw Library: MyHouse.java

CIS 110
```java
public class MyHouse {
    public static void main(String[] args) {
        // set the size of the window to 500 pixels by 500 pixels
        PennDraw.setCanvasSize(500, 500);
        PennDraw.clear(PennDraw.BLUE); // draw a blue sky
    }
}
```
Set Window Size

```java
public class MyHouse {
    public static void main(String[] args) {
        // set the size of the window to 500 pixels by 500 pixels
        PennDraw.setCanvasSize(500, 500);
        PennDraw.clear(PennDraw.BLUE); // draw a blue sky
    }
```
Color the entire window blue

```java
public class MyHouse {
    public static void main(String[] args) {
        // set the size of the window to 500 pixels by 500 pixels
        PennDraw.setCanvasSize(500, 500);
        PennDraw.clear(PennDraw.BLUE); // draw a blue sky
    }
}
```
Can replace BLUE with BLACK, CYAN, DARK_GRAY, GRAY, GREEN, LIGHT_GRAY, MAGENTA, ORANGE, PINK, RED, WHITE, or YELLOW

Color the entire window blue

```java
public class MyHouse {
    public static void main(String[] args) {
        // set the size of the window to 500 pixels by 500 pixels
        PennDraw.setCanvasSize(500, 500);

        PennDraw.clear(PennDraw.BLUE); // draw a blue sky
    }
}
```
Set the color to grass green

```java
// draw a green field
PennDraw.setPenColor(0, 170, 0);
PennDraw.tilledRectangle(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?

Each color is represented by 32 bits:

```
0000 0000 0000 0000 0000 0000 1111 1111
```

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

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

```java
// draw a green field
PennDraw.setPenColor(0.170, 0);
PennDraw.filledRectangle(0.5, 0.25, 0.6, 0.3);
```
// draw a green field
PennDraw.setPenColor(0, 170, 0);
PennDraw.filledRectangle([0.5, 0.25, 0.6, 0.3])
Coordinate System

(0, 0)

1.0

+y

1.0

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

```javascript
PennDraw.filledPolygon(0.255, 0.7, 0.745, 0.7, 0.49, 0.9);
```
Set line thickness (default is 0.002)

```java
PennDraw.setPenRadius(0.005); // thicken the pen for outline drawing
```
Draw a rectangle outline

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