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BEIJING QINGSEN
SCHOOL

AP-CSA
Data structure

YING HUANG

SEP.2022

OVERVIEW

- Getting Setup! (week 1)
- JAVA Basics (week 1)
- Variable (week 1-2)
- Conditionals (week 3)
- Loops (week 4)

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GETTING SETUP

JDK

IDEA

CREATE A NEW PROJECT !

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JAVA BASICS

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OPP vs. OOP

Procedure -oriented programming

VS.

Object-oriented programming

面向过程编程 vs. 面向对象编程

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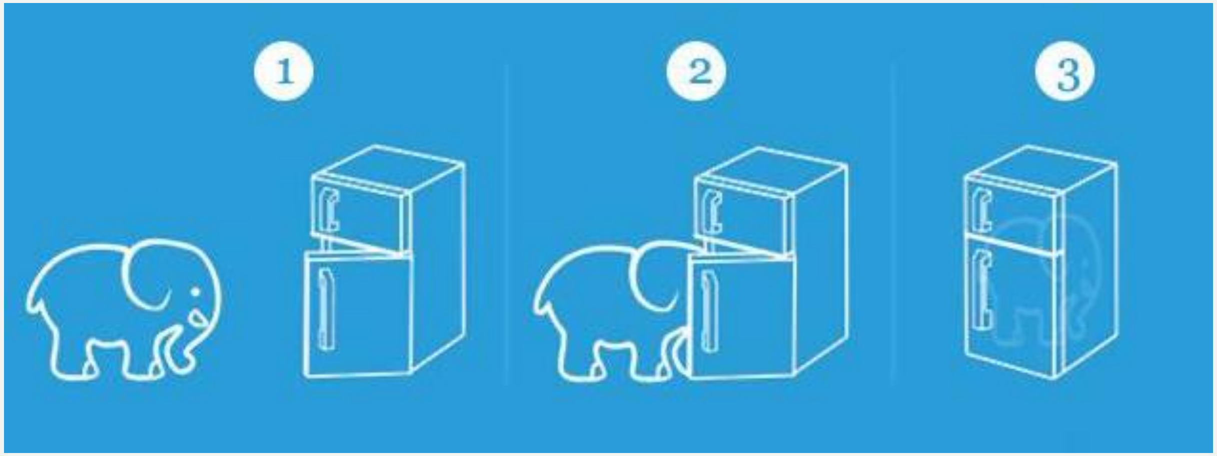
OPP

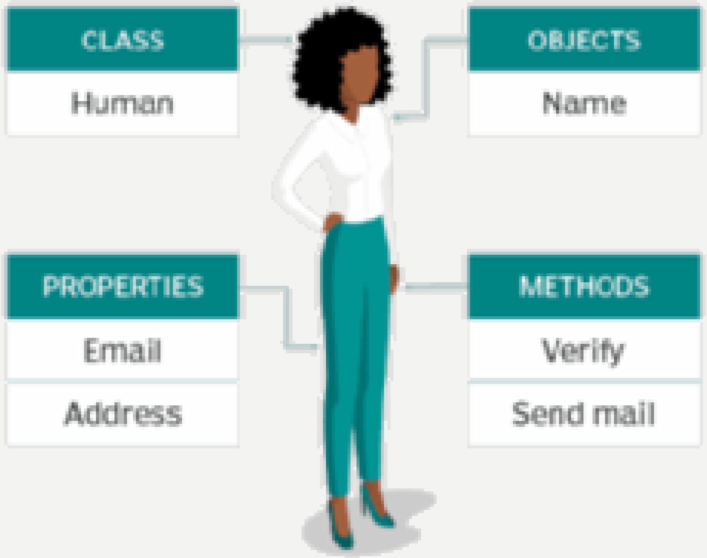
Procedure-oriented programming: Focuses on the procedures that programmers create.



OOP

Object-oriented programming:

Focuses on an objects that represent real-world things and their attributes and behaviors



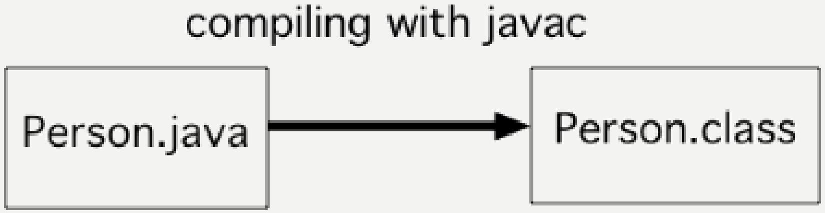
Do you think Java is OPP or OOP?

JVM	Java Virtual Machine
JRE	Java Runtime Environment
JDK	Java Development Kit Java

JAVA

Java is an **OOP programming language**, which means that we can use Java to tell a computer what to do.

Computers don't actually speak Java so we have to **compile (translate)** Java source files (.java) into class files (.class).



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JAVA TERMINOLOGY

- All Java code are organized into units called **classes**.
- **A class** defines a type and is used to define what all objects of that class know and can do.
- There are many classes that are part of the Java language.

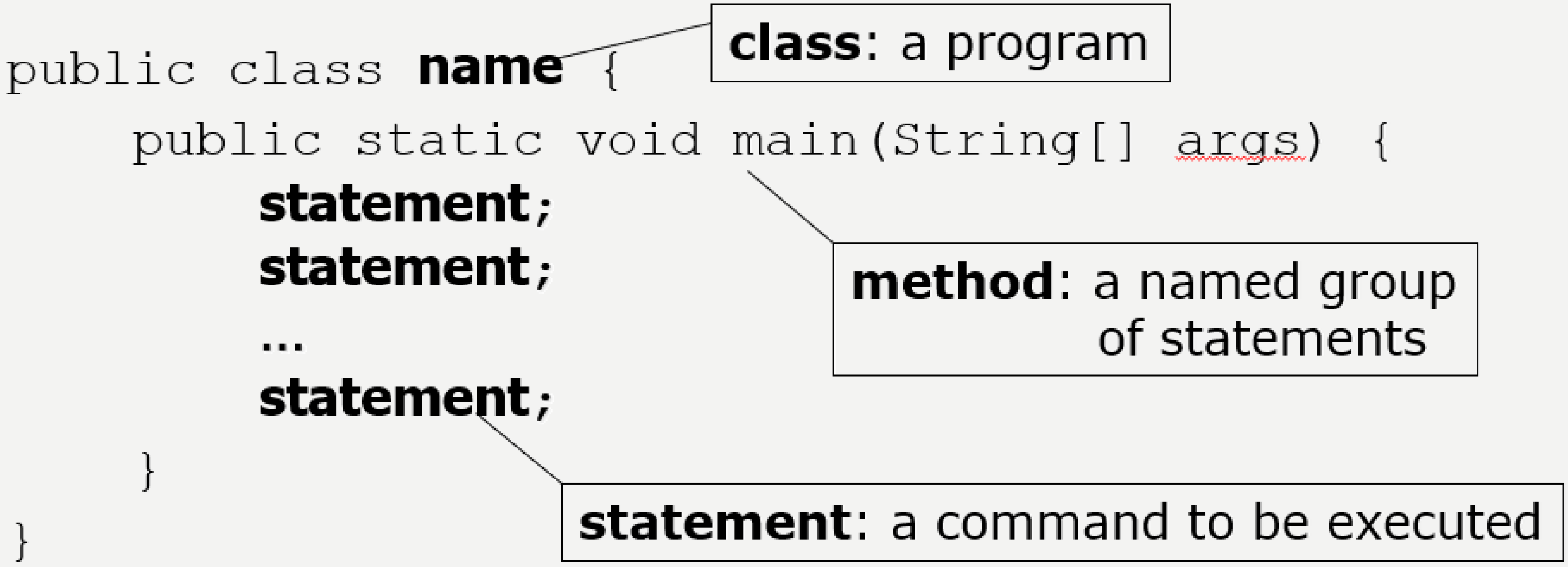
JAVA TERMINOLOGY

- **statement:** An executable piece of code that represents a complete command to the computer.

  every basic Java statement ends with a semicolon ;

- **method:** A named sequence of statements that can be executed together to perform a particular action or computation.

STRUCTURE OF A JAVA PROGRAM



```
public class name {
    public static void main(String[] args) {
        statement;
        statement;
        ...
        statement;
    }
}
```

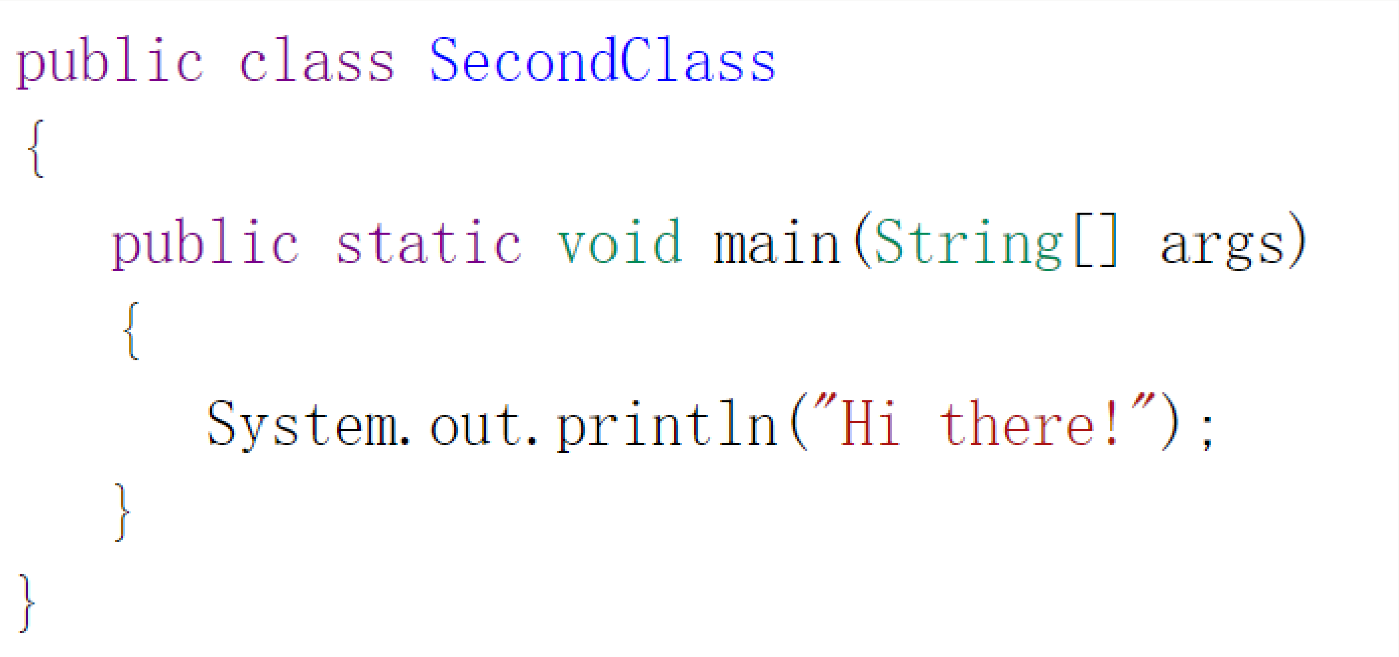
class: a program

method: a named group of statements

statement: a command to be executed

Every executable Java program consists of a **class**, called the **driver class**

EXAMPLE - JAVA



```
public class SecondClass
{
    public static void main(String[] args)
    {
        System.out.println(″Hi there!″);
    }
}
```

What is class name?
What is method?
What is statement?

PRINTING

Two ways to print a line of output on the console:

- `System.out.println()` is just the way that you ask Java to print out the value of something followed by a new line (ln).
- `System.out.print()` without the ln will print out something without advancing to the next new line.

EXERCISE 1.1

Q1 Output: (Using two print to do!)

```
Hi There!
Welcome to APCS A!
```

Q2 Output: (Using three print to do!)

```
Hi There! Welcome to APCS A!
We will learn Java!
```

EXERCISE 1. 2 FIND ERROR

```
pooblic class Errors
   public static void main(String args){
      System.out.print("Good morning! ")
      system.out.print("Good afternoon!);
      System.Print "And good evening!";


}
```

EXERCISE 1. 2 CORRECT

```
public class Errors {
   public static void main(String[] args){
      System.out.print("Good morning! ");
      System.out.print("Good afternoon!”);
      System.out.print ("And good evening!“);
     }
}
```

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COMPILER TIME ERRORS

Compiler time error: An error that is found during the compilation. These are also called syntax errors.

Such as:

Missing semicolon;

Too many or too few { } braces

Misspelled variable name or method name;

….

COMMENTS

- **Comment:** A note written in source code by the programmer to describe or clarify the code.
  - Comments are not executed when your program runs.

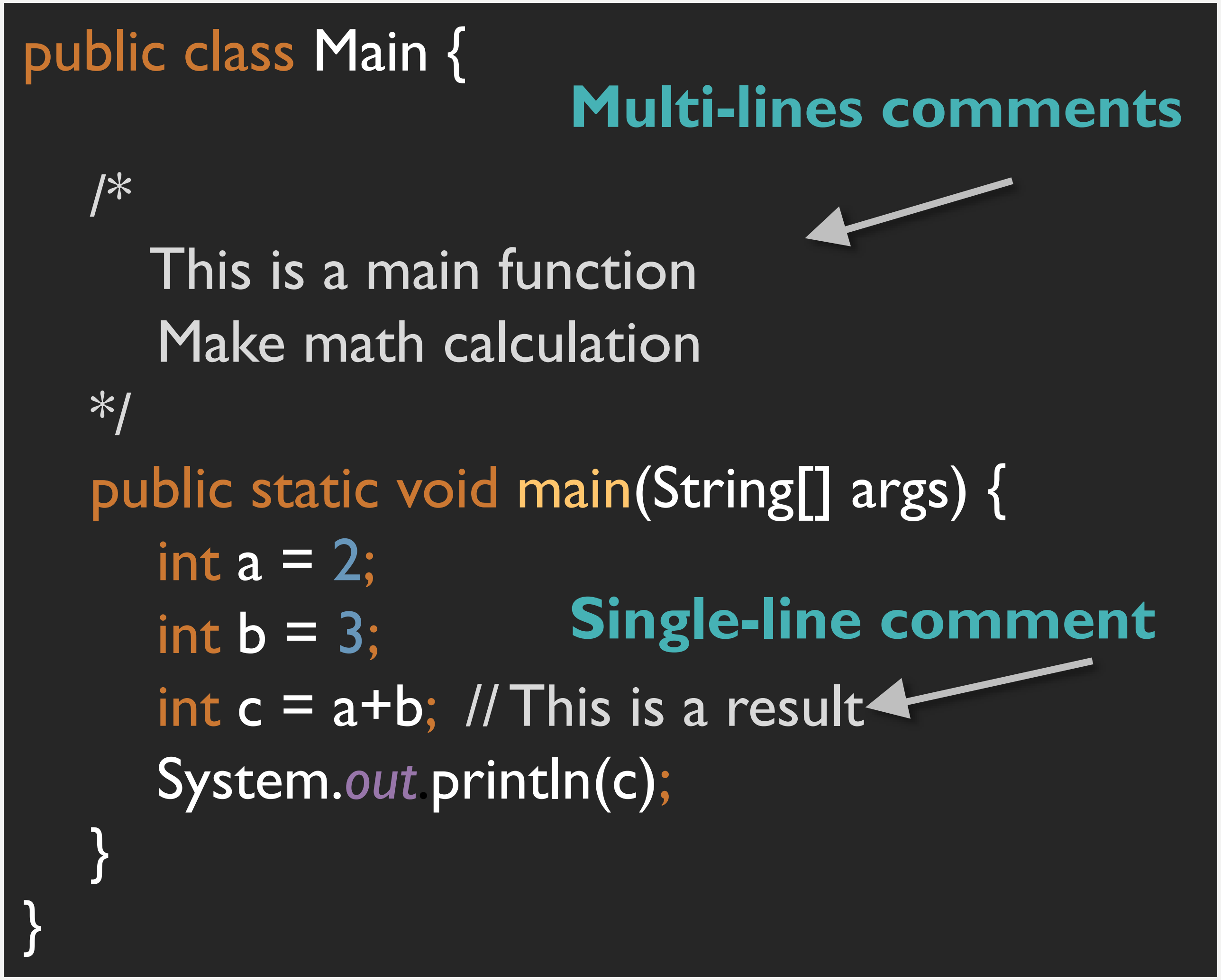
- **Syntax:**

```
//  comment text, on one line
```

or,

```
/*  comment text; may span multiple lines
*/
```

EXAMPLE OF COMMENTS



```
public class Main {

    /*
        This is a main function
        Make math calculation
    */
    public static void main(String[] args) {
        int a = 2;
        int b = 3;
        int c = a+b;  // This is a result
        System.out.println(c);
    }
}
```

Multi-lines comments

Single-line comment

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USING COMMENTS

- Where to place comments:
  - at the top of each file (a "comment header")
  - at the start of every method
  - to explain complex pieces of code

- Comments are useful for:
  - Understanding larger, more complex programs.
  - Multiple programmers working together, who must understand each other's code.

INDENT NICELY!

```
public class Welcome{ public static void
  main(String[] args){ System.out.println("Hi
  there!”);System.out.println(”Welcome to APCS
  A!");}}
```

```
public class Welcome{
   public static void main(String[] args){
      System.out.println("Hi there!");
      System.out.println(”Welcome to APCS A!");
   }
}
```