Overview of Java Object-Oriented Programming Language Concepts

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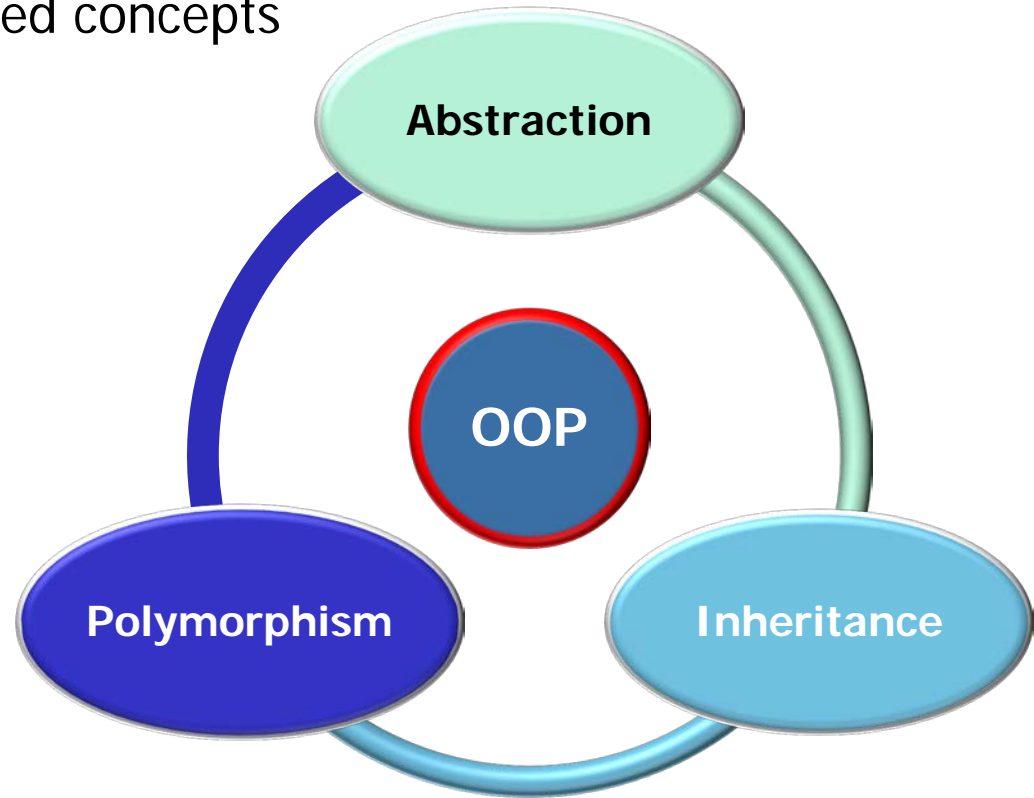**Nashville, Tennessee, USA**

Learning Objectives of this Lesson

- Understand the key object-oriented concepts supported in Java

See en.wikipedia.org/wiki/Java_(programming_language)

Overview of Key Object-Oriented Concepts Supported by Java

Key Object-Oriented Concepts Supported by Java

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Key Object-Oriented Concepts Supported by Java

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  - Thus, Java apps were organized in terms of *structural* elements

See en.wikipedia.org/wiki/Object-oriented_programming

Key Object-Oriented Concepts Supported by Java

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  - Thus, Java apps were organized in terms of *structural* elements
  - e.g., classes, interfaces, & packages
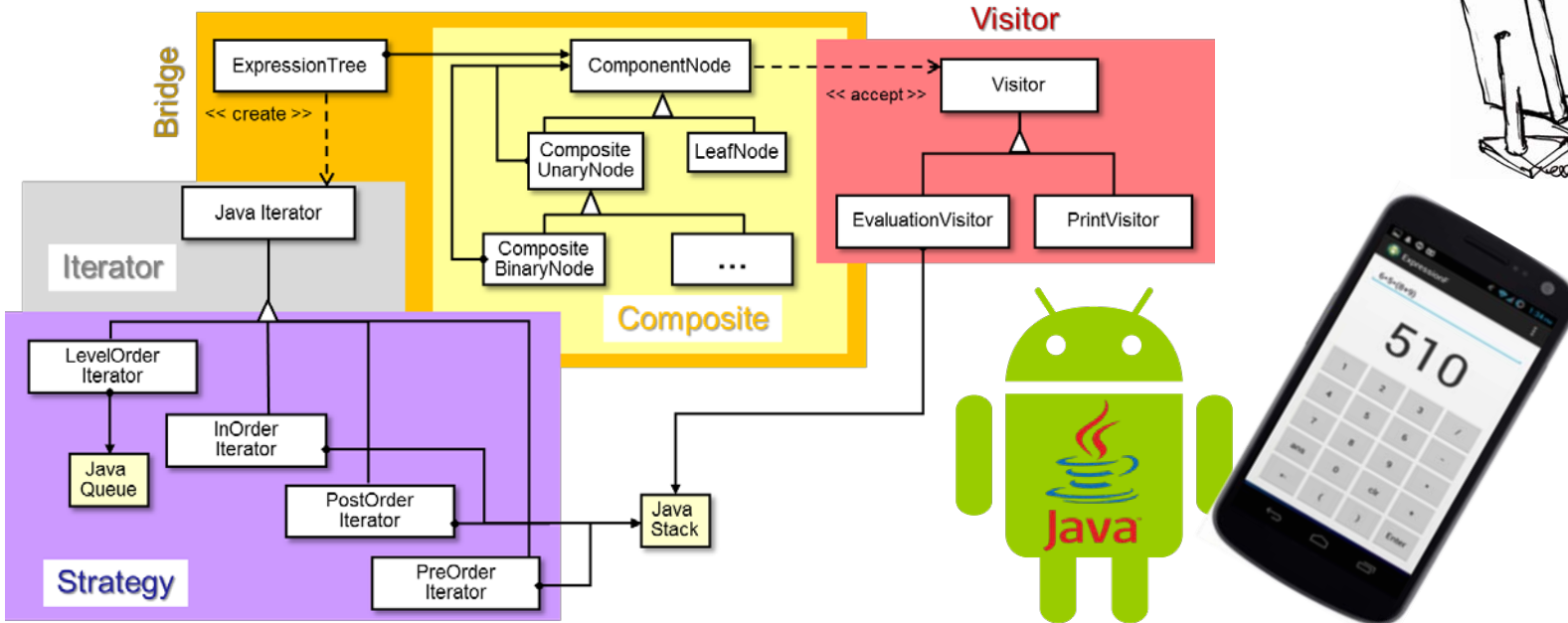
See en.wikipedia.org/wiki/Software_design_pattern

Key Object-Oriented Concepts Supported by Java

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Key Object-Oriented Concepts Supported by Java

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  - An object in Java resides in a memory location of a computer


```
          SimpleSet<T>

Object[] mElementData
int mSize
int mEnd
...

boolean add(E element)
boolean contains(Object o)
int size()
...
```

See github.com/douglascraigschmidt/CS891/blob/master/ex/ImageCounter/src/main/java/utils/SimpleSet.java

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  - It consists of

    - *State* – represented via data fields

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See docs.oracle.com/javase/tutorial/java/javaOO/variables.html

Key Object-Oriented Concepts Supported by Java

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  - An object in Java resides in a memory location of a computer
  - It consists of
    - *State* – represented via data fields
    - *Behavior* – represented via methods

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Key Object-Oriented Concepts Supported by Java

- Objects often correspond to real-world entities

anAccount : Account
Money mCurrentBalance boolean mOverdraftProtection ...
void deposit(Money amount) void withdrawl(Money amount) Money checkCurrentBalance() ...

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Key Object-Oriented Concepts Supported by Java

- Many non-object-oriented programming languages organize apps in terms of *functional* elements

See en.wikipedia.org/wiki/Procedural_programming

Key Object-Oriented Concepts Supported by Java

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  - e.g., actions & logic
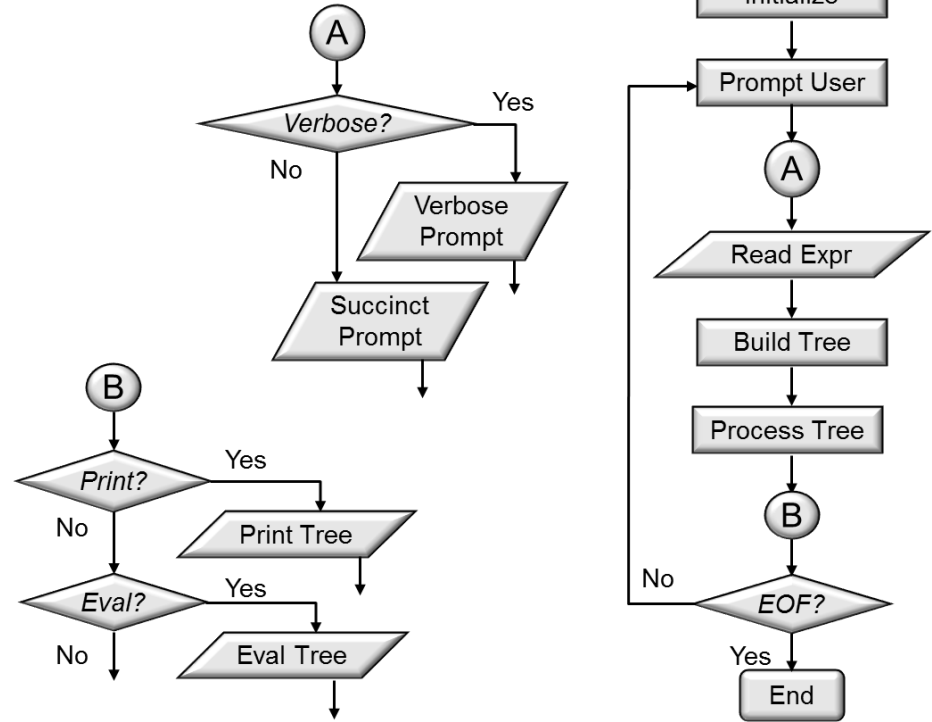
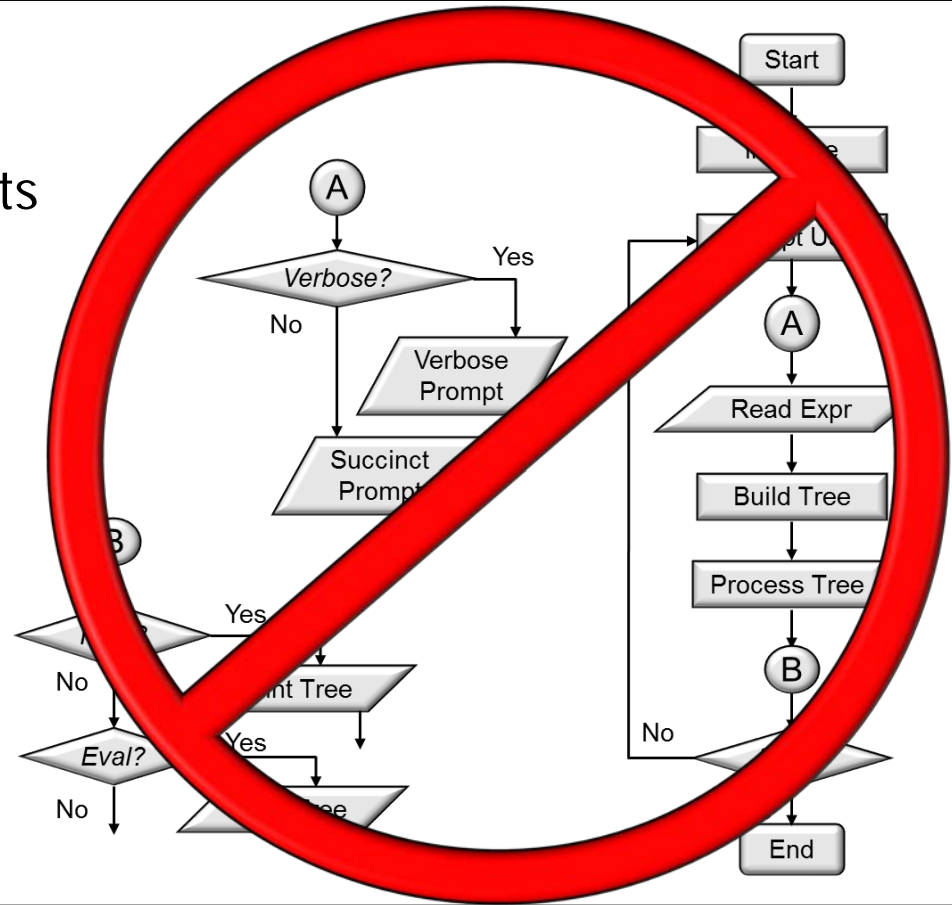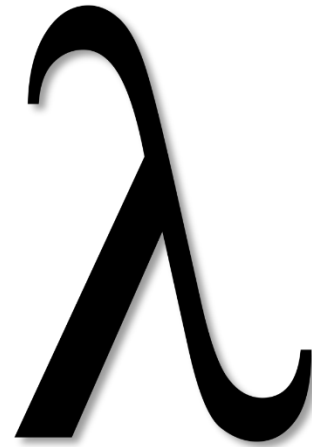# Key Object-Oriented Concepts Supported by Java

- Object-oriented Java programs also perform actions & contain logic

Account

`Money mCurrentBalance`
`boolean mOverdraftProtection`
`...`

`void deposit(Money amount)`
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- Object-oriented Java programs also perform actions & contain logic
  - However, these functional elements don't constitute main focus in the object-oriented parts of Java
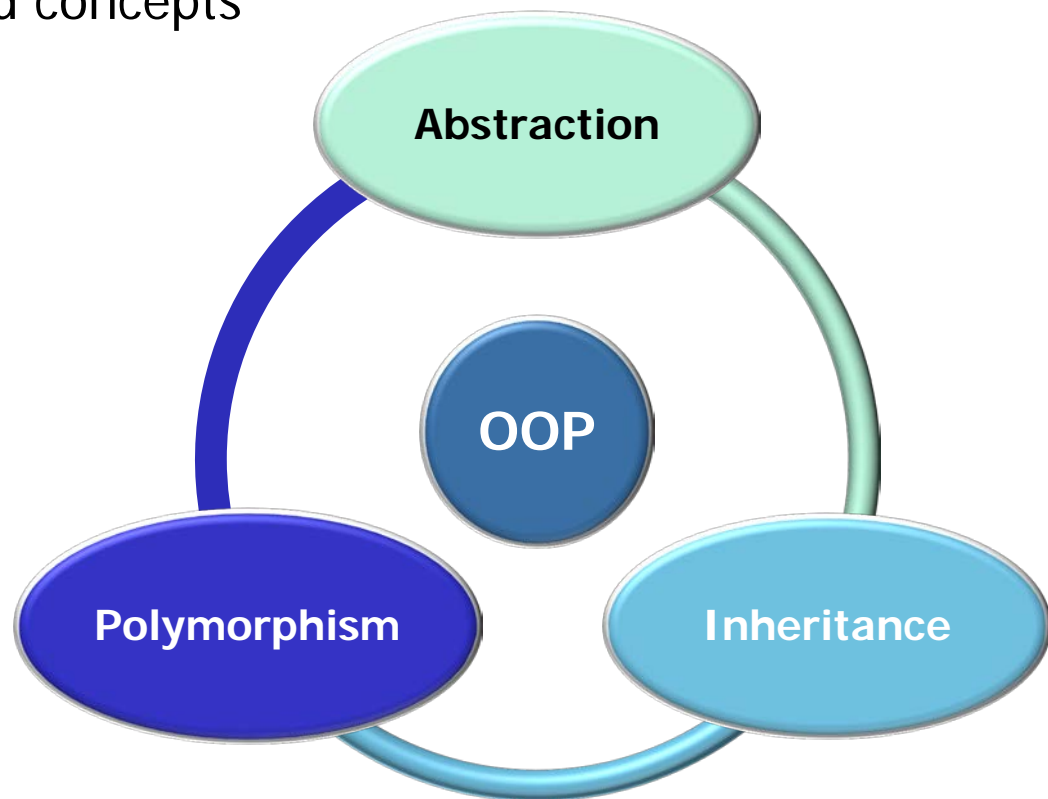

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Key Object-Oriented Concepts Supported by Java

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Java 8 *does* focus heavily on functional programming

Key Object-Oriented Concepts Supported by Java

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  - Data & control abstractions
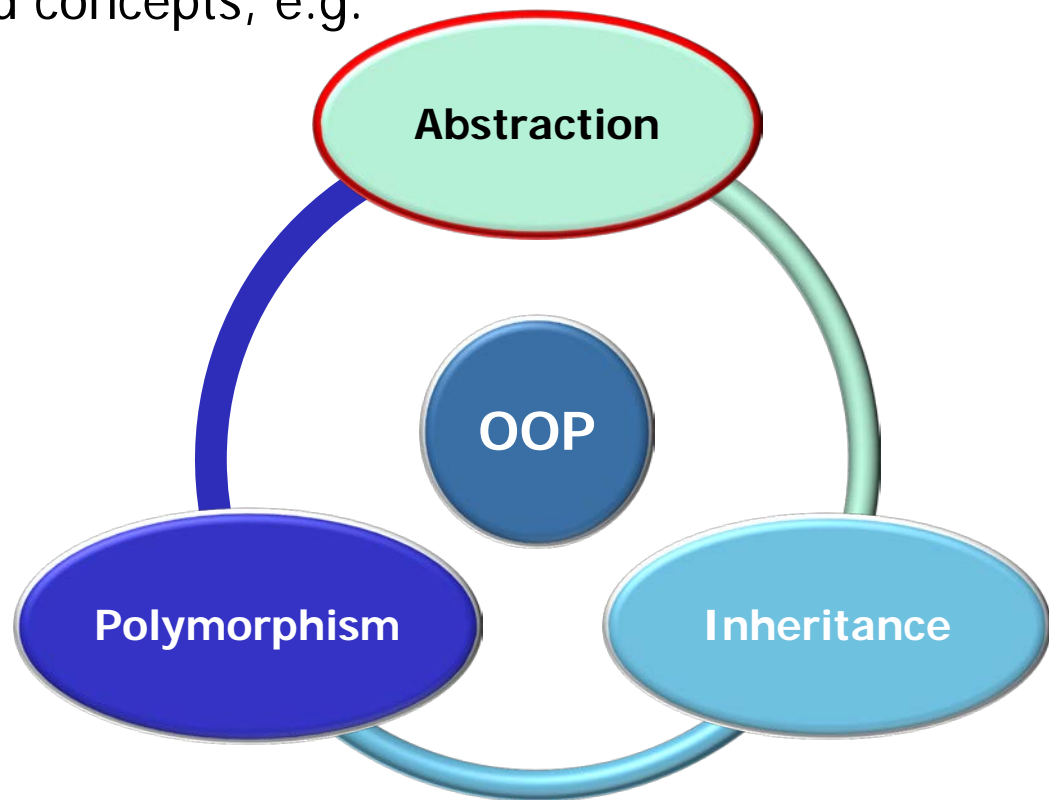
See en.wikipedia.org/wiki/Abstraction_(computer_science)
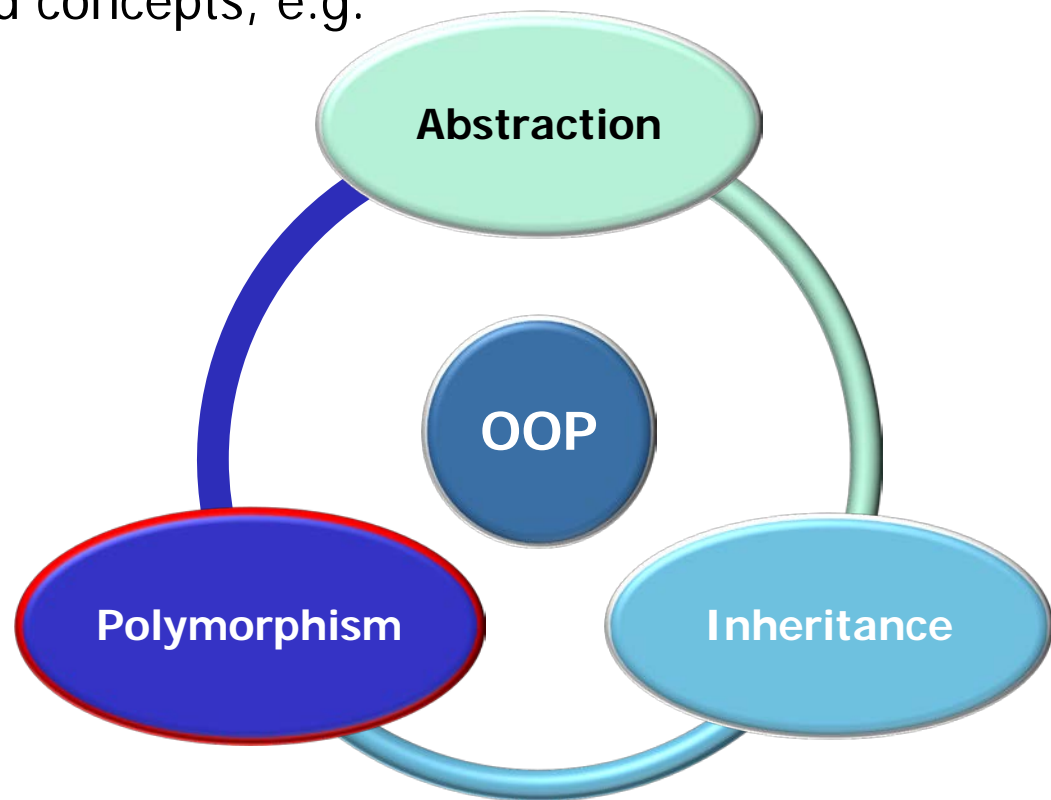
Key Object-Oriented Concepts Supported by Java

- Java supports key object-oriented concepts, e.g.
  - Data & control abstractions
  - Inheritance
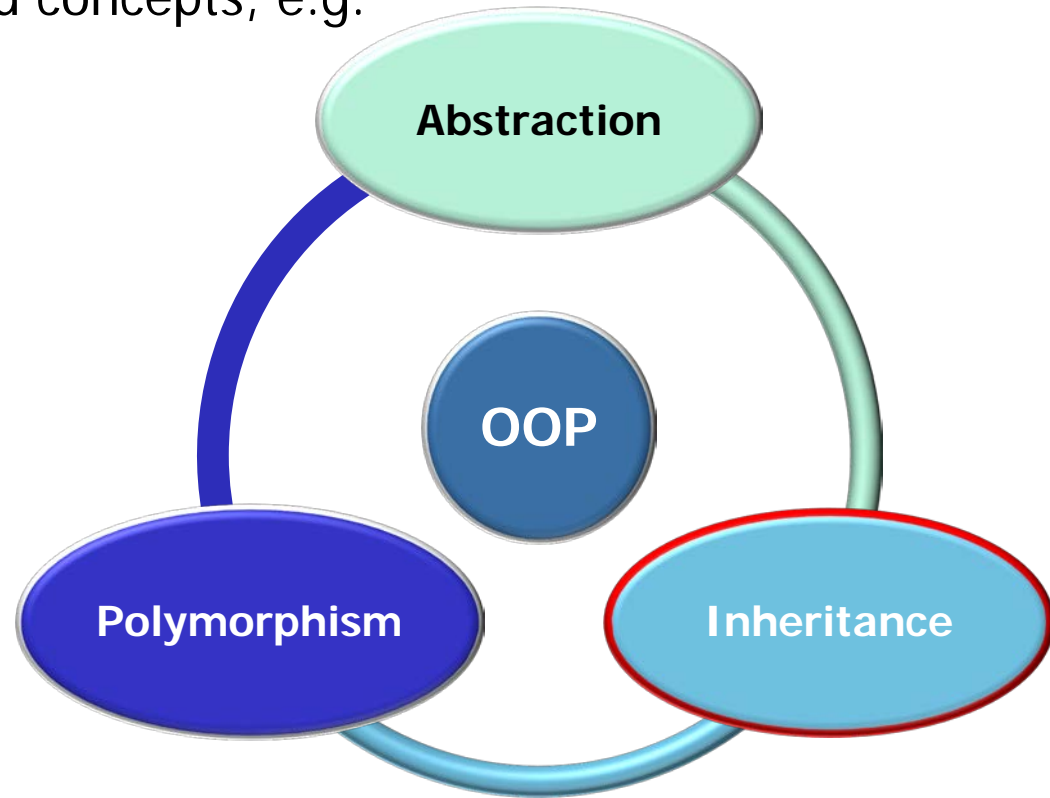
See en.wikipedia.org/wiki/Inheritance_(object-oriented_programming)

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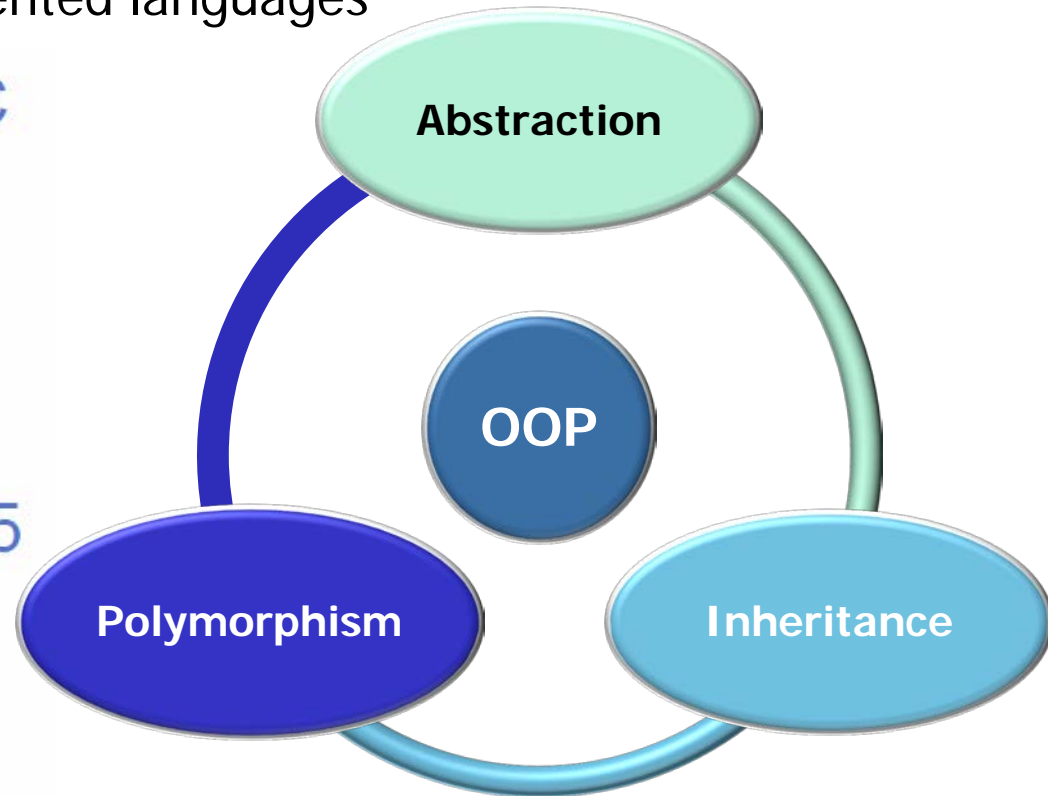 - Inheritance
  - Polymorphism

See en.wikipedia.org/wiki/Polymorphism_(computer_science)

- There are many other object-oriented languages

See en.wikipedia.org/wiki/List_of_object-oriented_programming_languages
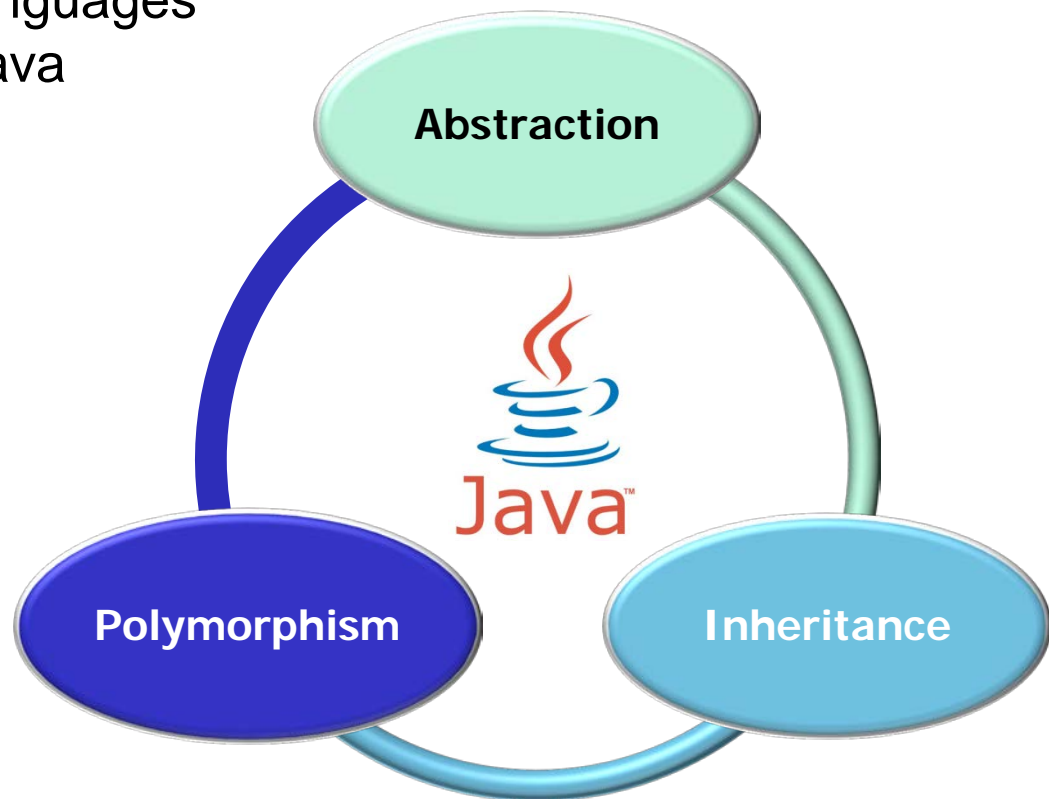
Key Object-Oriented Concepts Supported by Java

- These are (arguably) the most popular today
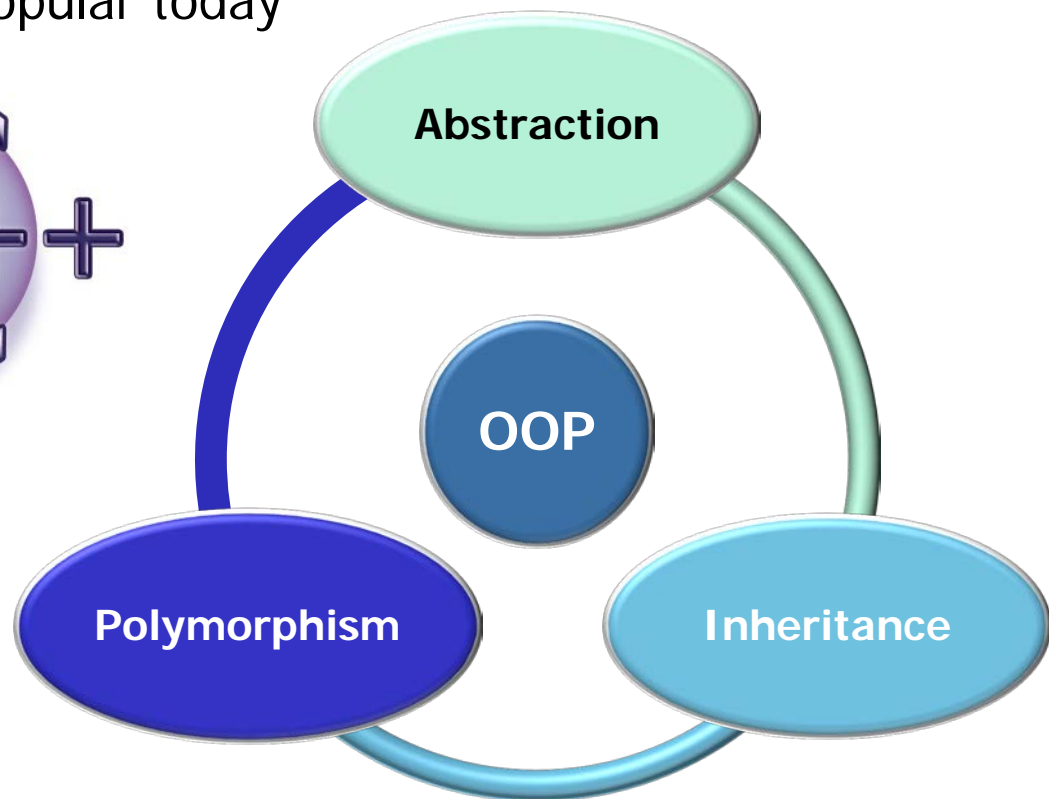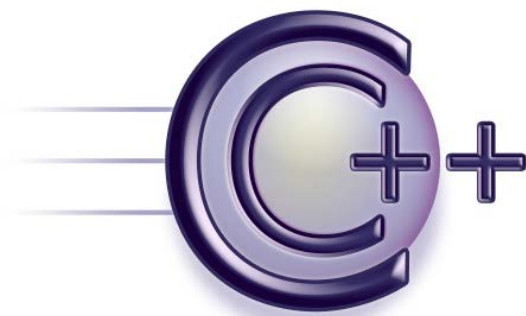
See en.wikipedia.org/wiki/List_of_object-oriented_programming_languages

Key Object-Oriented Concepts Supported by Java

- Learning other object-oriented languages is much easier once you know Java

Key Object-Oriented Concepts Supported by Java

- If you already know Java well you'll be bored by some parts of this material!

Key Object-Oriented Concepts Supported by Java

- If you already know Java well you'll be bored by some parts of this material!
  - We will therefore move through this material fairly quickly

Please ask any questions about this material since other lessons depend on it..

End of Overview of Java Object-Oriented Programming Language Concepts