Object Oriented Caesar Cipher

Introduction

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Object Oriented Programming

- Java: Object Oriented Language
  - What does that mean?

Object Oriented Programming

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- Encapsulate code and data

```
Object = Code + Data
```

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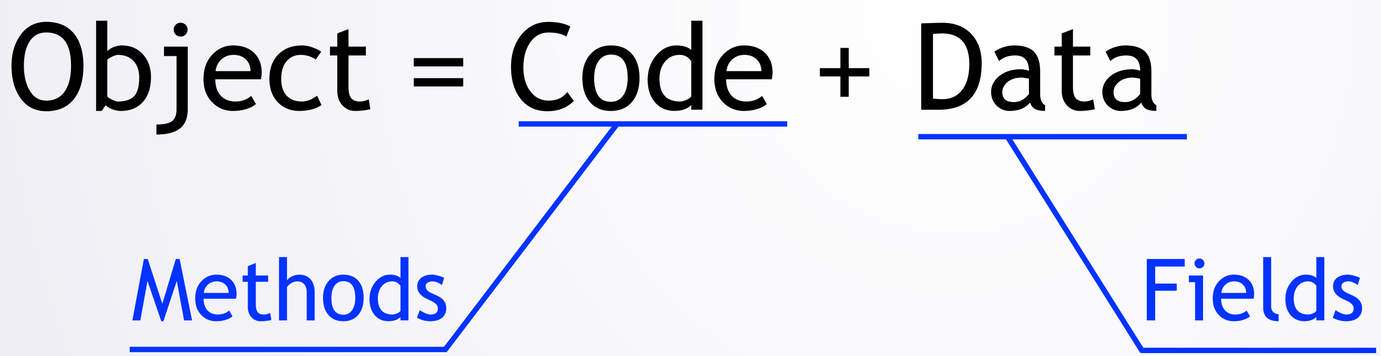


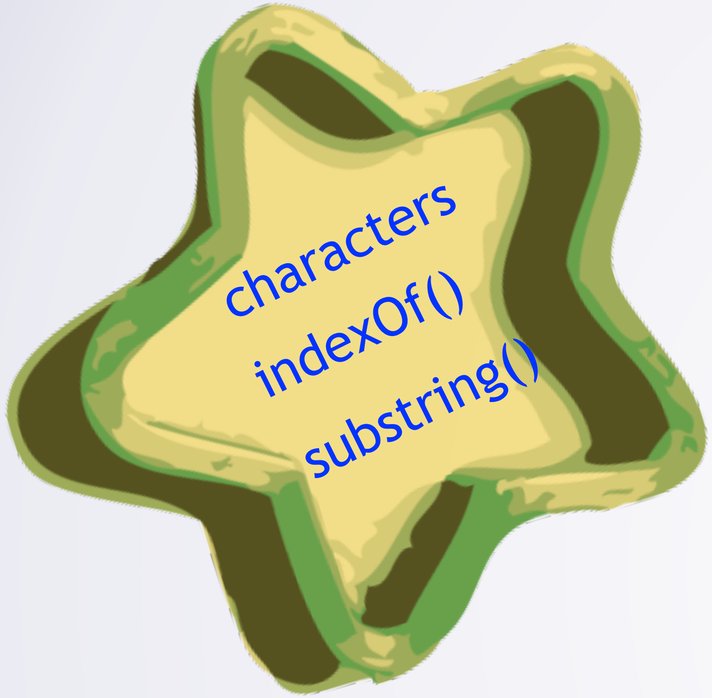
Familiar: String, ImageResource, ...

- Familiar example: String
  - Data: sequence of characters
  - Code: indexOf, substring,…

```
CTACGATGCCTGATGA
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
```

method	value
s.length()	15
s.indexOf("program")	4
s.indexOf("q")	7
s.indexOf("f")	-1
s.indexOf("q",8)	14
s.startsWith("duke")	true
s.endsWith("king")	false
s.substring(4,7)	"pro"
s.toUpperCase()	DUKEPROGRAMMING

Class = Type, Object = Instance



- Classes are types:
  - Define what is in objects of that type
- Objects are instances of class
  - Can make many (use: `new`)

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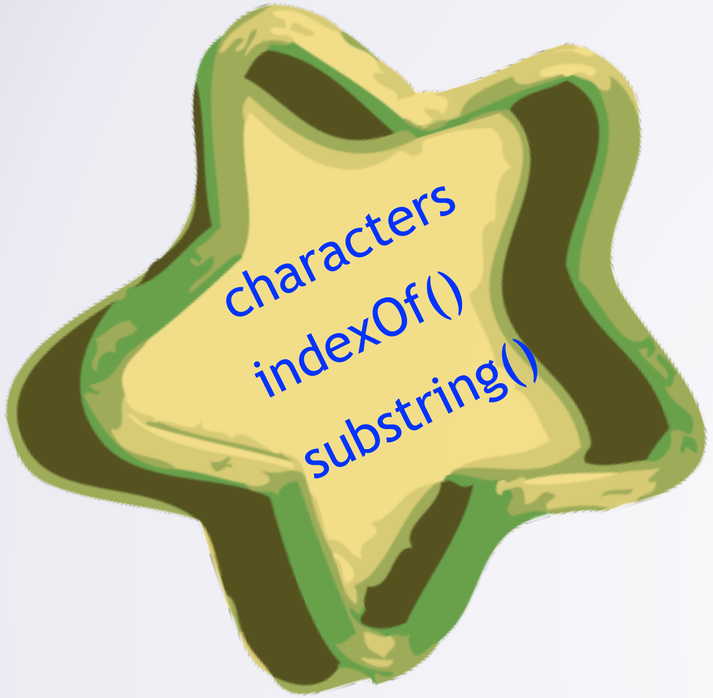


```
characters = H e l l o
int indexOf(String str) {...}
String substring(int beginIndex) {…}
```

```
characters = W o r l d
int indexOf(String str) {...}
String substring(int beginIndex) {…}
```

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Why OO?

- Why objects and classes?
  - Facilitate large programs
- Some basics here: **fields**, **constructors**, **visibility**
- Java Programming: Principles of Software Design