

CSE M226: Programming Languages

Lecture 3: Introduction to Ruby and OOP

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Ruby Features Most Interesting for this course

- Ruby is a **pure object-oriented language** - all values in the language are objects.
 - In Java, as an example, some values that are not objects are null, 13, true, and 4.0.

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 - In Ruby, every expression evaluates to an object.

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 - You call a method “on” an object, e.g., **obj.m(3,4)** evaluates the variable **obj** to an object and calls its **m** method with arguments **3** and **4**.
 - Not all object-oriented languages are class-based; see, for example, JavaScript.

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 - A reasonable compromise between multiple inheritance (like in C++) and interfaces (like in Java).
 - Every Ruby class has one superclass, but it can include any number of **mixins**, which, unlike interfaces, can define methods (not just require their existence).
 - Functionality of a particular module to be added to the functionality of a class, or of a specific object

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 - If the receiver (the object on which we call the method) does not define the method, we get a dynamic error.

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 - instance variables (called fields in many object-oriented languages) to be added and removed from objects
 - methods to be added and removed from classes while a program executes.

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 - Various built-in methods make it easy to discover at run-time properties about objects.
 - As examples, every object has a method **class** that returns the object's class, and a method **methods** that returns an array of the object's methods.

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 - Blocks are almost like closures and are used throughout Ruby libraries for convenient higher-order programming.
 - Indeed, it is rare in Ruby to use an explicit loop since collection classes like Array define so many useful iterators.
 - Ruby also has fully-powerful closures for when you need them.

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 - There is no precise definition of what makes a language a scripting language.
 - It means the language is engineered toward making it easy to write short programs, providing convenient access to manipulating files and strings, and having less concern for performance.
 - Like many scripting languages, Ruby does not require that you declare variables before using them and there are often many ways to say the same thing.

Ruby Features Most Interesting for this course

- Ruby is **popular for web applications**:
 - The Ruby on Rails framework is a popular choice for developing the server side of modern web-sites