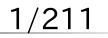
Be a language designer

Yukihiro "Matz" Matsumoto @yukihiro_matz

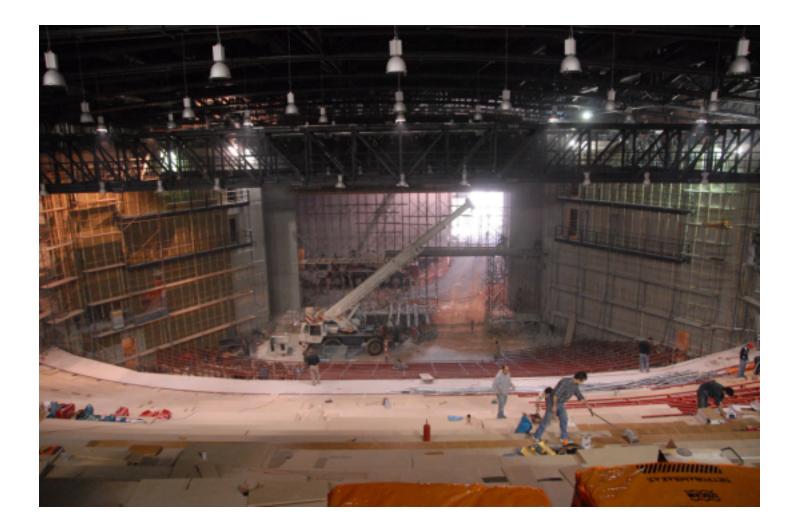


Athens





April Fool's Day





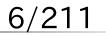
Euruko







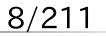




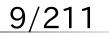






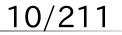




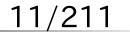


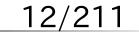


Well, most of us



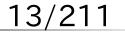
As programmers



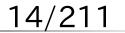


We program

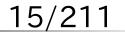




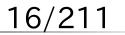




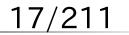






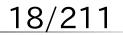






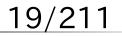


Just bits



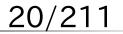


Os and 1s





10011011100001...



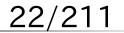


We don't understand bits

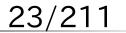


Do you?

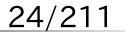






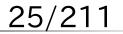




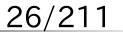


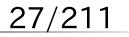


They try to understand us





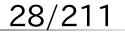




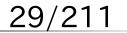
using programming languages



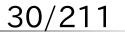
We tell computers how to work









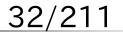






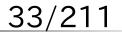


puts "Hello World"



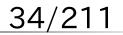


In the real world, No





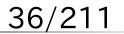
Why?



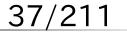












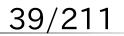


Business rules



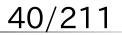


Laws



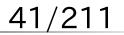


Traditions



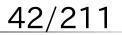


Cultures

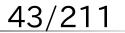




Human mind

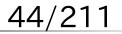




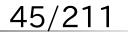




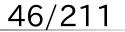
Complexity: being complex







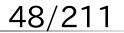




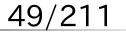






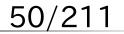




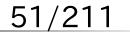




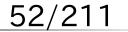
60 trillion cells in a human body





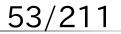




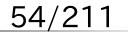




your ±7 item slots

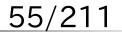






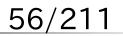


Framework?





Library?





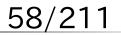
DSL?





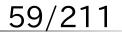


Language?



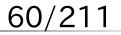


Language!

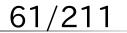




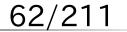
Not only because I push Ruby







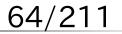


















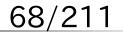




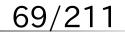
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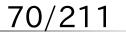
Example: Recursion



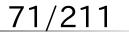




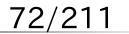




How do we battle against complexity using programming languages?

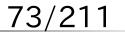






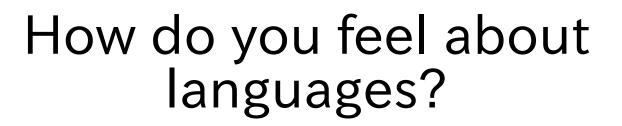


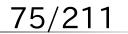
It's a matter of mind





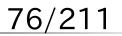








Given

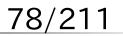




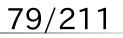
Designing a language



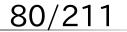
Freedom



Freedom gives you power

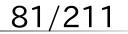






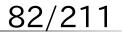


Understanding of your mind



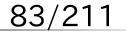


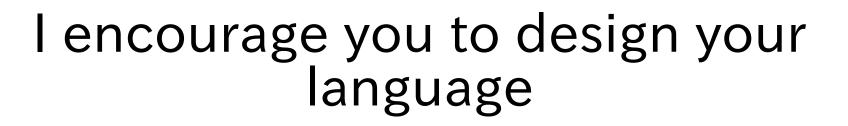
Understanding of human nature

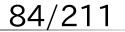




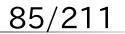
Understanding of programming

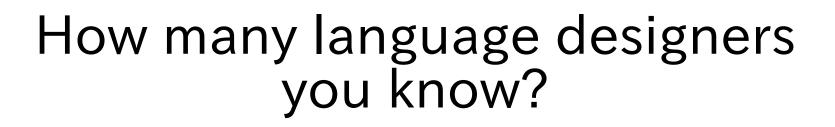


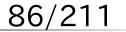






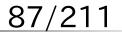






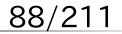


me (Ruby)



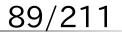


Guido (Python)



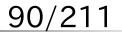


Larry (Perl)





Rasmus (PHP)



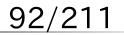


?



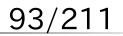


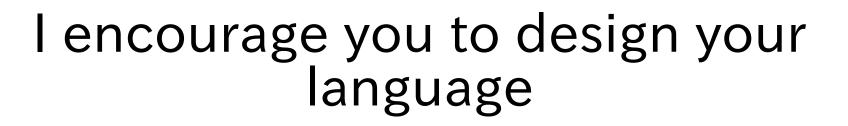
Join them?

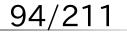




I am serious



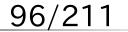




Language geeks

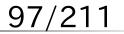








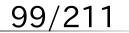
"language"





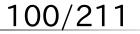








In that sense, API is a language





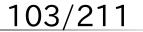
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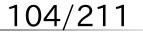
User interface is a language



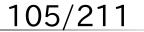




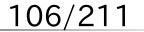




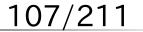




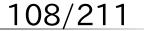


















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Model

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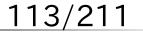


Syntax

- Vocabularies
- Model

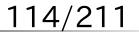
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Model: that something formed by the combination of syntax and vocabularies

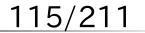




Model: the designer's intention







Example

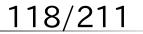
Ruby the object-oriented programming language

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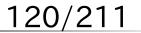




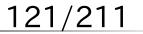










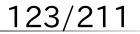




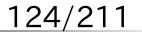
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Ruby provides blocks to combine

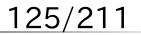




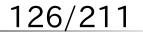




Blocks

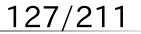




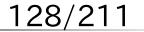




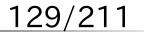
But it only takes one





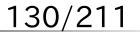








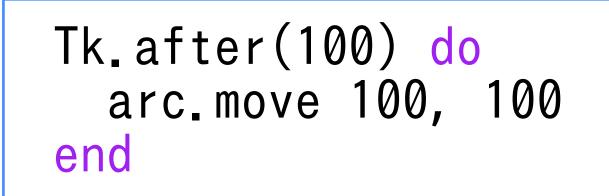
It can be used as callbacks

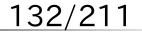




Like Tk event handler

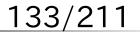
131/211



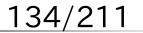




It can be used as scopes



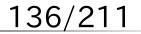




describe Bowling, "#score" do it "returns 0 for all gutter game" do bowling = Bowling.new 20.times { bowling.hit(0) } bowling.score.should eq(0) end end

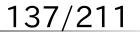


It can be used as rules





Like Rakefiles

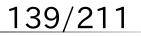


task :default => [:test]
task :test do
 ruby "test/unittest.rb"
end

138/211

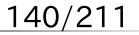


Classes, objects and blocks

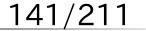




You can build your own blocks

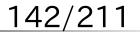


Programming is a process of designing your own DSL -- Dave Thomas



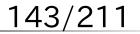


Ruby is a kit to build your DSL



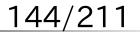


This is a model

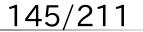




This is an illusion

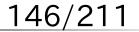






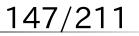


Rails = Ruby + Something



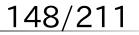


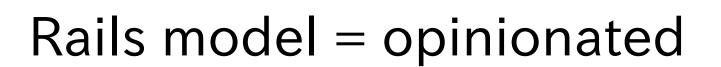
Rails syntax = Ruby syntax

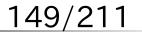




Rails vocabularies = Ruby + Web

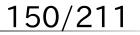




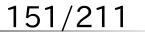




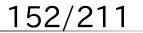
MVC the Rails way





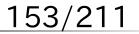






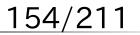


This is a model

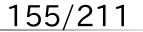




This is an illusion

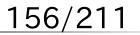




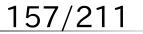




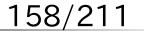
Patterns





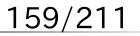


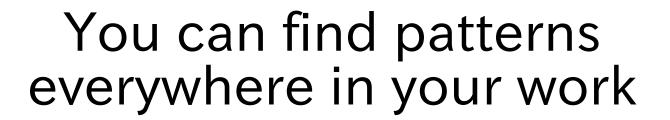


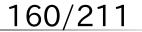




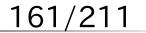
Your work reflects the real world





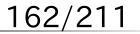






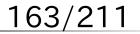


Try to be concise



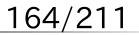


Abstraction

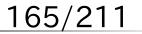




Hide detail





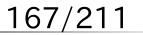




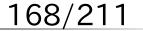
Maximize your ± 7 item slots











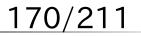


You can learn it from patterns



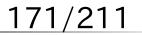


Your enemy



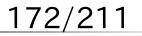


Perfection

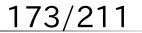




Real world is full of exceptions

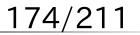






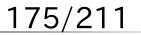


Don't try to do everything at once

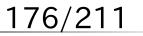




It leads to leaky abstraction

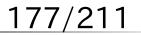








80:20 rule

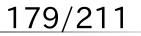




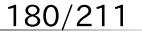




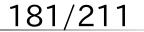
Limitation is you friend



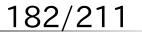






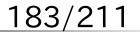








Then enhance it



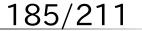


Be a designer



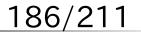






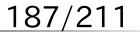


Designer is a decision maker





Decision is freedom

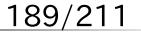




Freedom is power

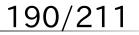




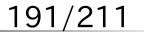




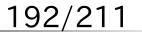
Motivation gives you more power



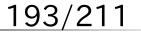




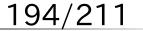


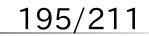








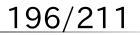




DSL

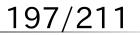


Frameworks



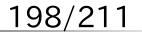


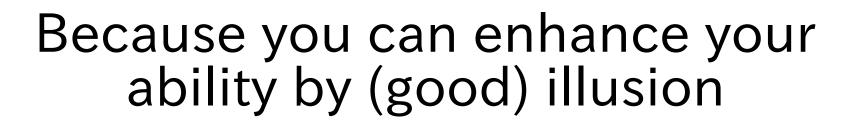
Patterns

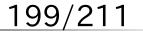




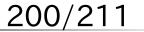
Be an illusionist

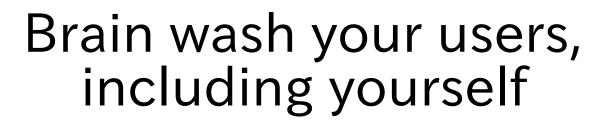


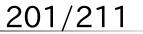






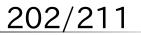






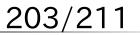


Just like I did



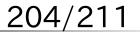


Thank you



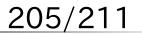


Ruby2.0?



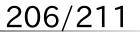
FAA







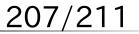
Ruby2.1?





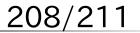


Christmas!



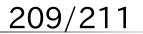


mruby?



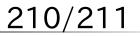








Any questions?





Thank you

