Kids, Ruby, Fun!

Introduction of the Smalruby and Ruby Programming Shounendan

Kouji Takao,
The Ruby Programming Shounendan,
RubyConf 2014, 11.19.2014

Ruby Programming Shounendan

Kody : Kouji Takao

- CRuby commiter
  (Readline module)
- A leader of the
  Ruby Programming
  Shounendan

Shounen = Boys & Girls
Dan = Organization

Kody : Kouji Takao

- Engineer of NaCl
  - Network Applied Communication Laboratory

- Contact

  kouji@smalruby.jp

  @takaokouji_en

  Facebook

Made possible by

NaCl

http://en.wikipedia.org/wiki/File:Japan_location_map_with_side_map_of_the_Ryukyu_Islands.svg : Maximilian Dörrbecker (Chumwa) CC-BY-SA 3.0CC by SA

http://en.wikipedia.org/wiki/File:Japan_location_map_with_side_map_of_the_Ryukyu_Islands.svg : Maximilian Dörrbecker (Chumwa) CC-BY-SA 3.0CC by SA

6 years ago,

Started to Teach Ruby for youth

Motivations

Ruby City MATSUE Project

TEACH MY SON RUBY

Ruby City MATSUE Project

- By Matsue-city
- Promote IT Business
- Increase Rubyists
- Find Ruby teachers

Matsue Mayer
Masataka Matsura
Image from http://www.matsuura-m.jp/

TEACH MY SON RUBY

- Love Ruby
- Love IT Engineering
- Make materials for teaching Ruby to youth

Find Ruby teachers + Make materials for teaching Ruby to youth

Started to Teach Ruby for youth

Since then

1% / year

in Matsue-city

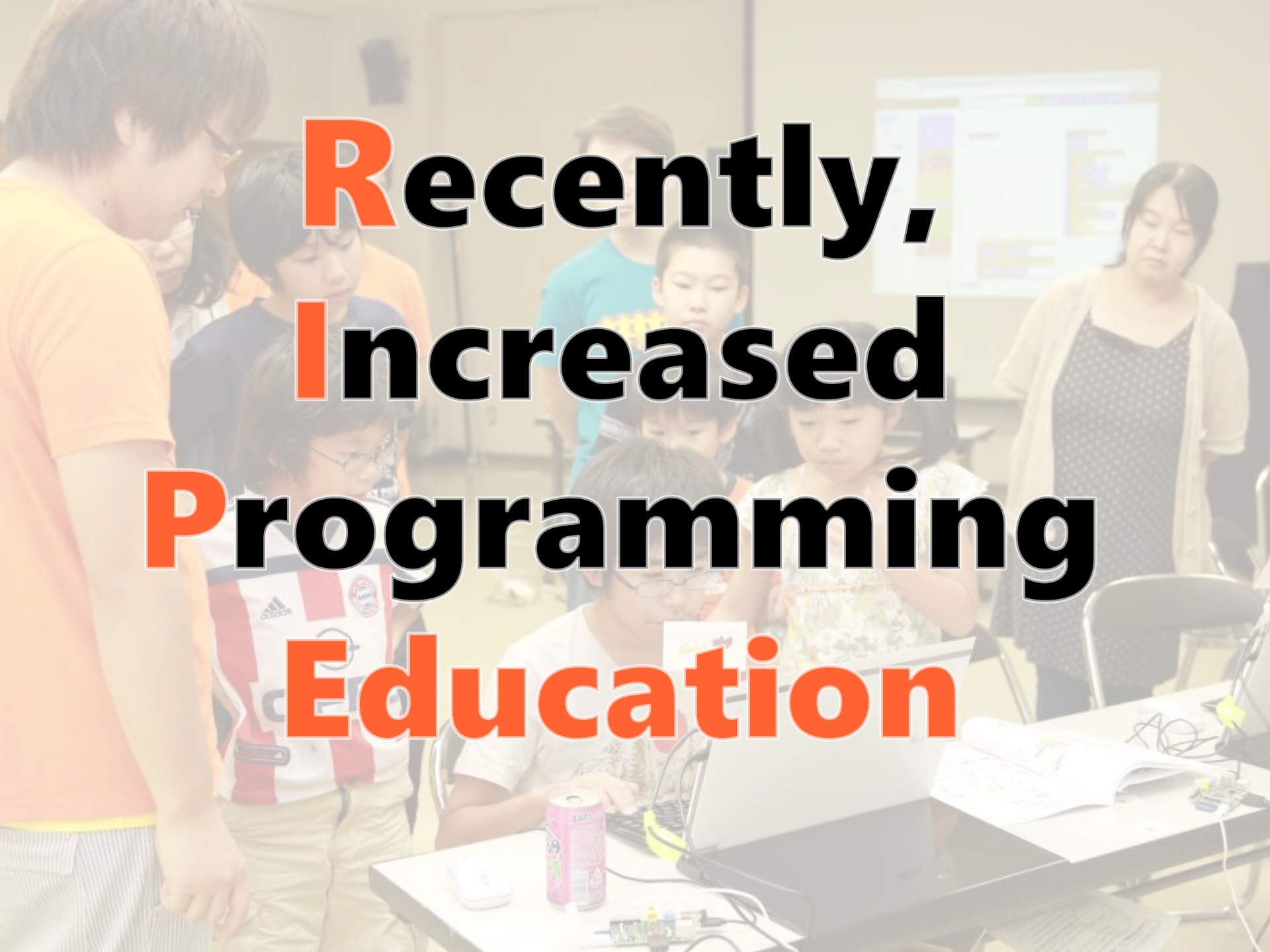
Ruby is

A Dogrammer's Best Friend

AND KIDS?

Problems

- Typing
- English
- Ruby Syntax


Recently,
Increased
Programming
Education

20,000 Teachers

"Should be a compulsory subject!"

By President Obama

Compulsory education

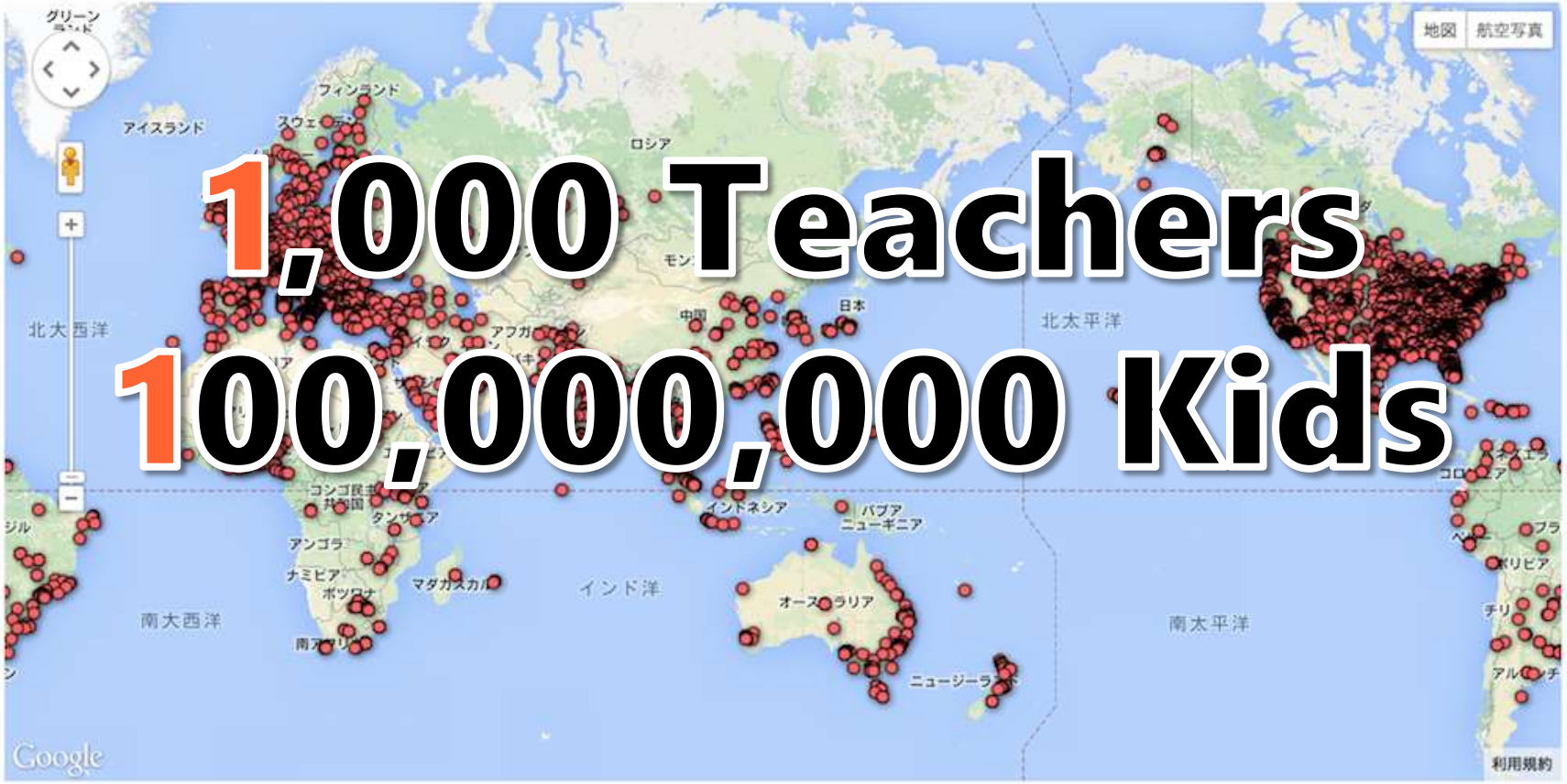
for ages 5-16

Concept of algorithms Building and Debugging

It is Practical!

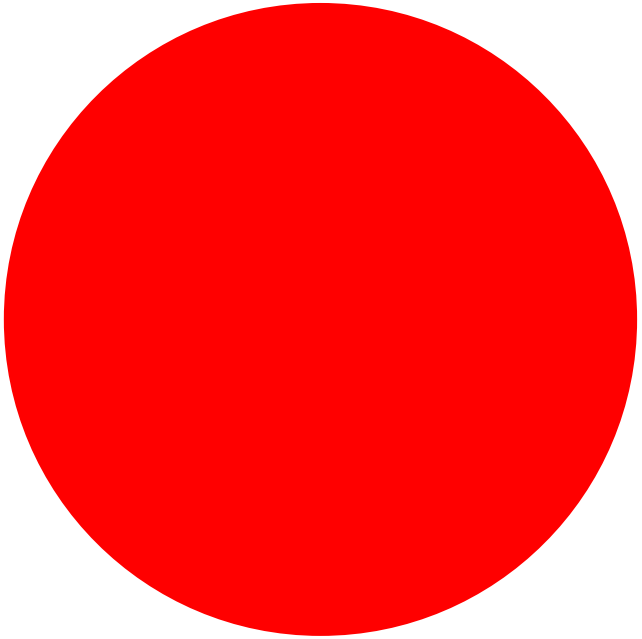
HOUR OF CODE by Code.org

27,230 events around the world



http://hourofcode.com/

Japan

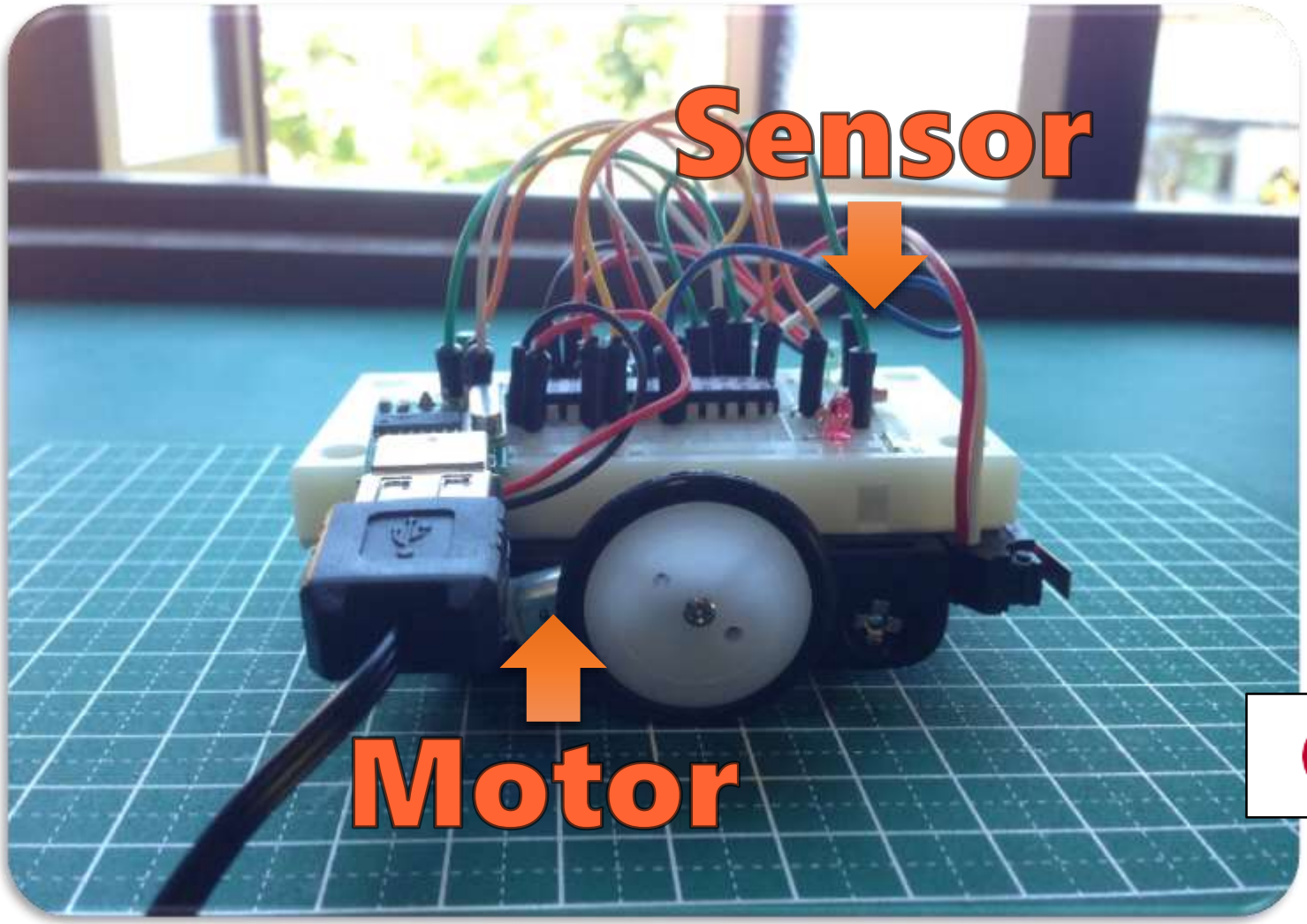


Government

Compulsory Education

Junior high school / Since 2012

Measurement and Control



1 Computer / 1 Student

～2020

Ex) Distributed tablets to all 6-12 ages in Saga-city

about 4,000 students

Company

PEG

- Joint project of CANVAS and Google
- CANVAS hold many workshops for children
- Distributed 5,000 Raspberry Pi

http://pegpeg.jp/

TENTO

Individualized instruction

http://www.tento-net.com/

Life is Tech!

Boot camping

http://life-is-tech.com/

Programming education as a Service

= PaaS ;-)

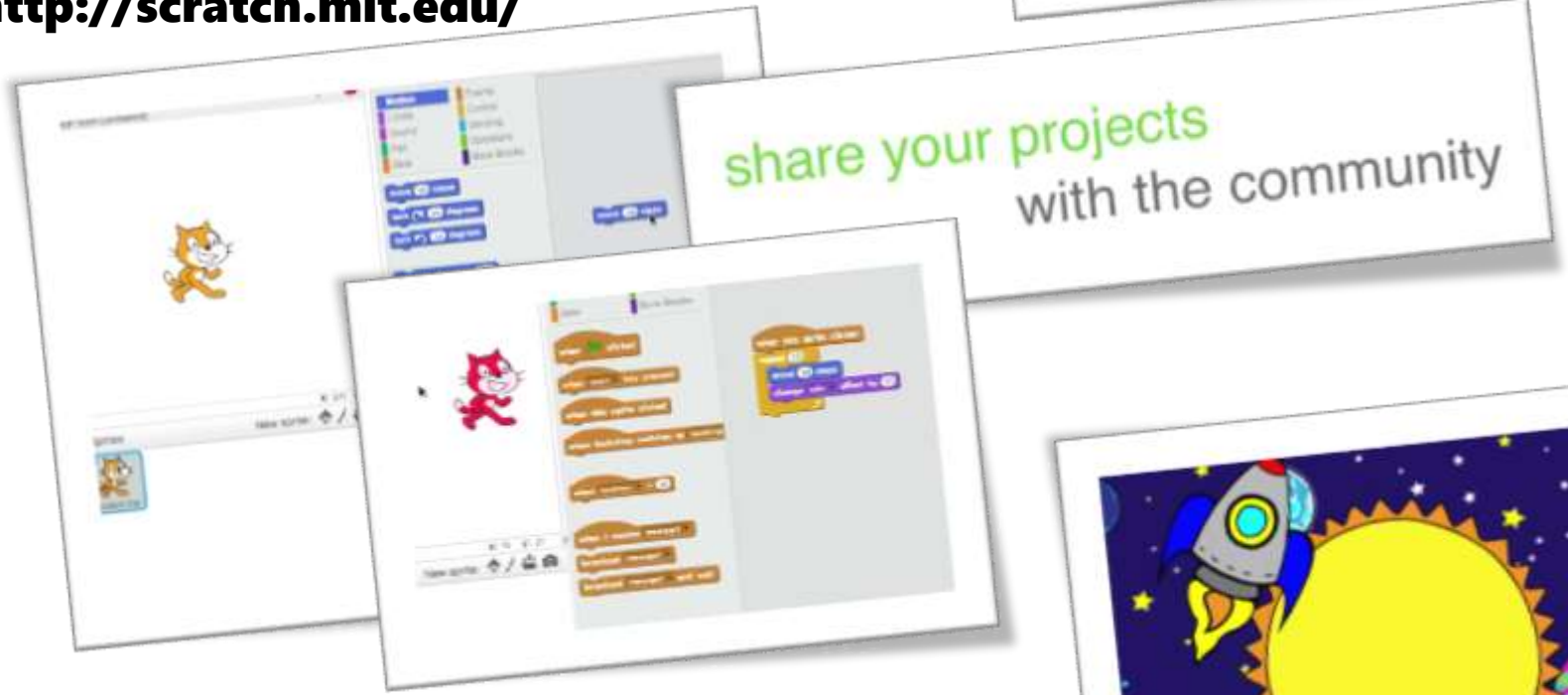
Why many kids programming workshops are held?

Great tools and materials!

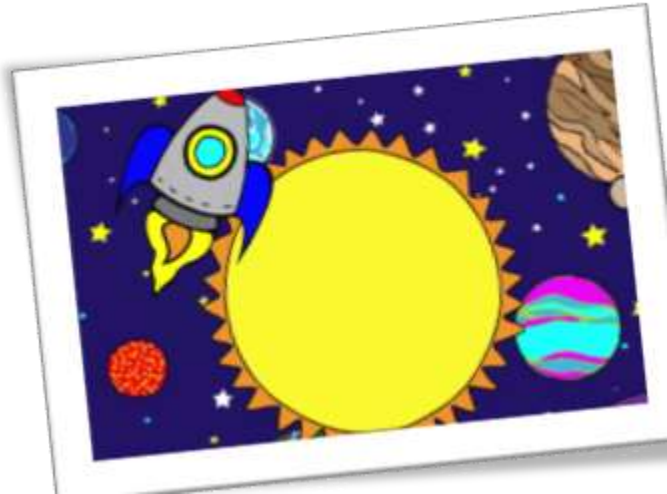
SCRATCH

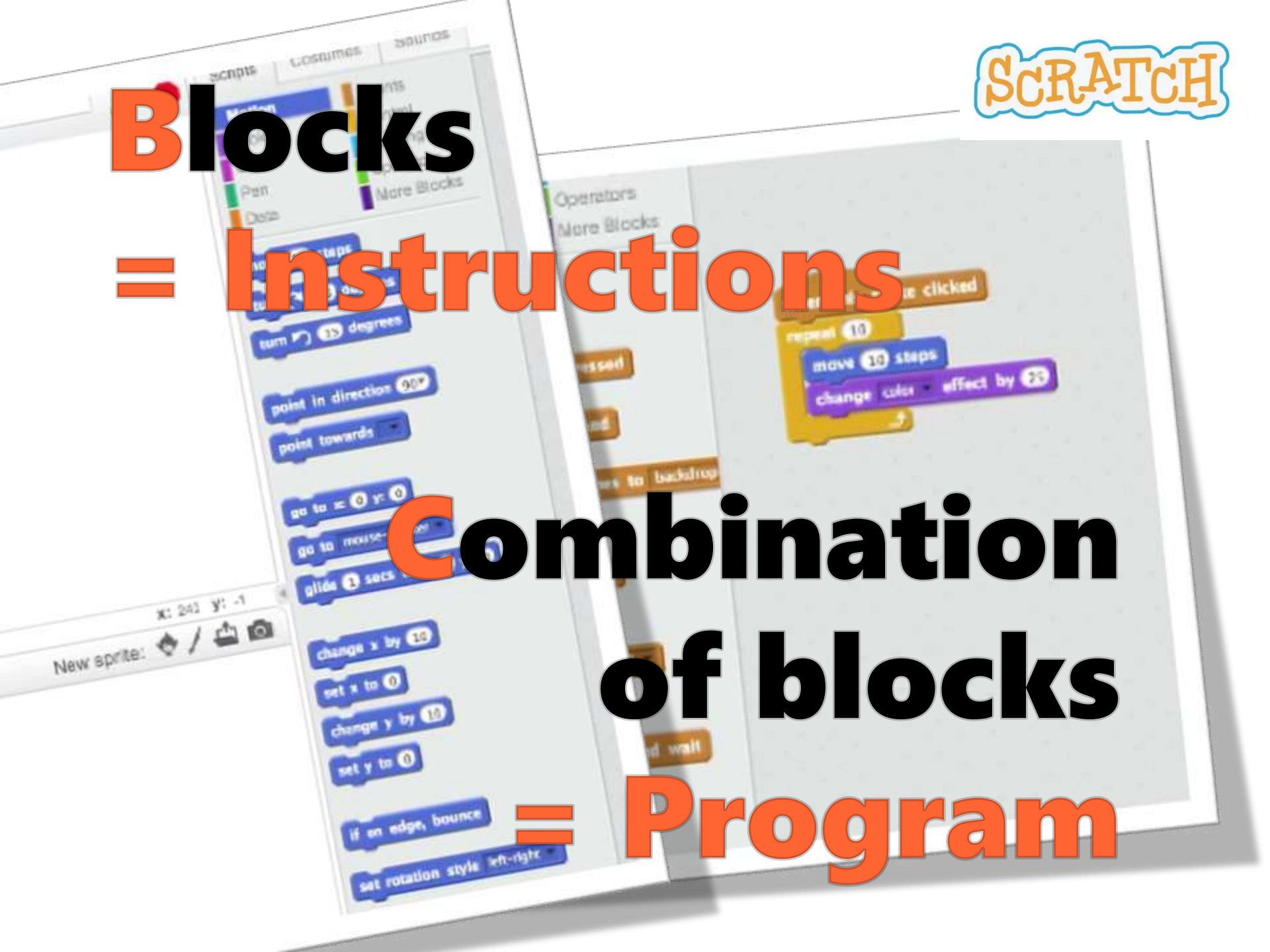
by MIT Media Lab

http://scratch.mit.edu/



http://vimeo.com/65583694




Blocks
= Instructions
Combination
of blocks
= Program
SCRATCH
Scripts
Costumes
Sounds
Motion
Pen
Data
More Blocks
Operators
More Blocks
turn 15 degrees
point in direction 90
point towards
go to x: 0 y: 0
glide 1 secs
change x by 10
set x to 0
change y by 10
set y to 0
if on edge, bounce
set rotation style left-right
repeat 10
move 10 steps
change color effect by 25
x: 242 y: -1
New sprite:

Internationalization

English ⇔ Japanese

Easy to run

SCRATCH

Problems

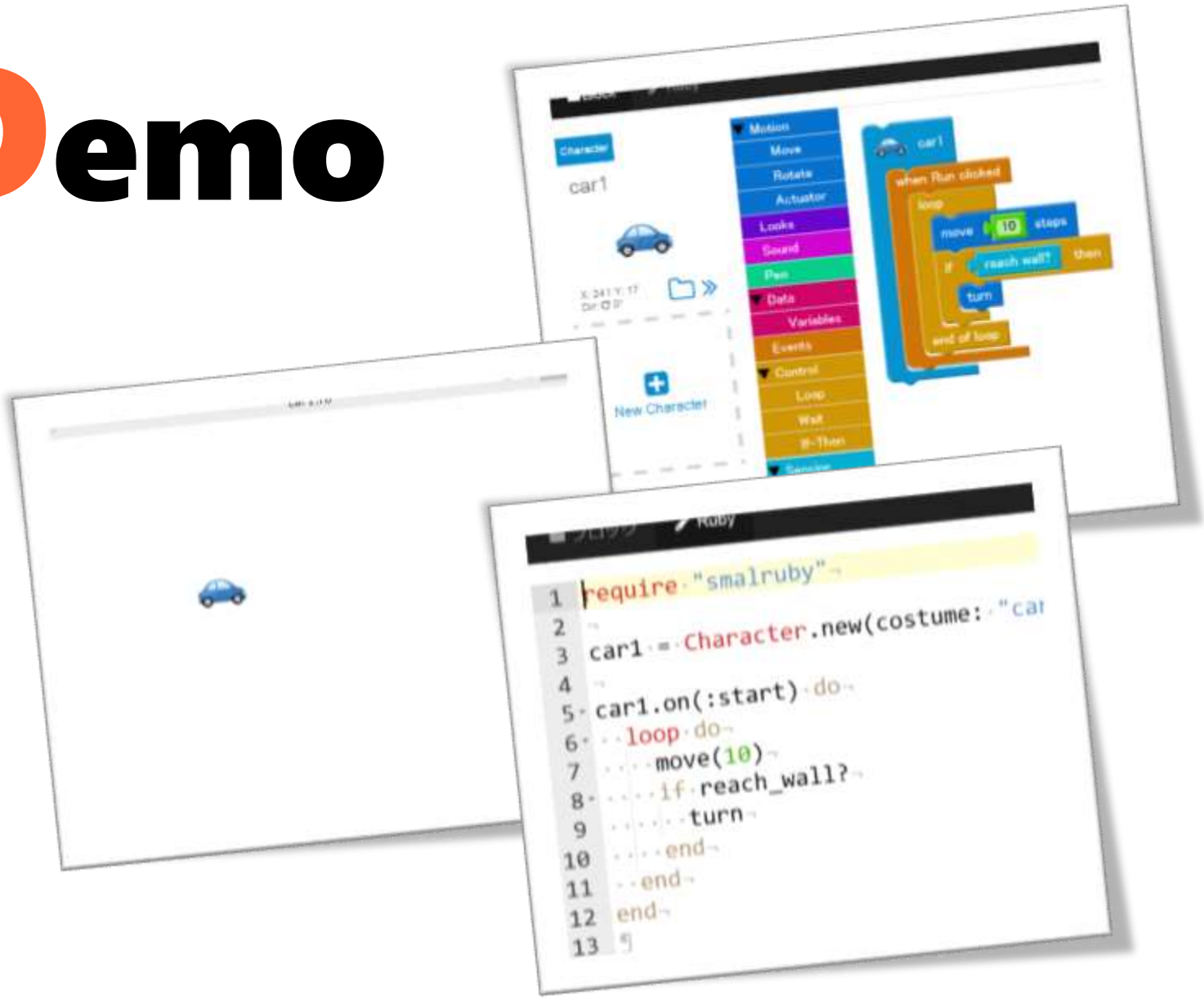
- Typing
  ➡Blocks
- English
  ➡ Internationalization
- Ruby syntax
  ➡ Combination of blocks

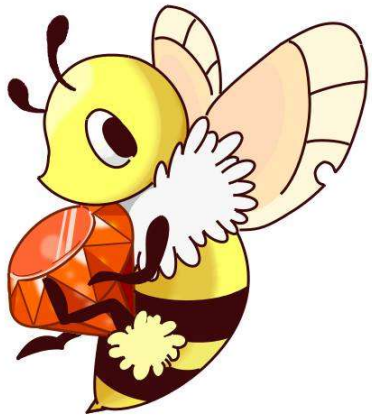
Ruby + Scratch

Smalruby

(smɔ´ːrúːbi)

Demo


car1
New Character
Motion
Move
Rotate
Actuator
Looks
Sound
Pen
Data
Variables
Events
Control
Loop
Wait
If-Then
when Run clicked
loop
move 10 steps
if reach wall? then
turn
end of loop
require "smalruby"
car1 = Character.new(costume: "car
car1.on(:start) do
loop do
move(10)
if reach_wall?
turn
end
end
end

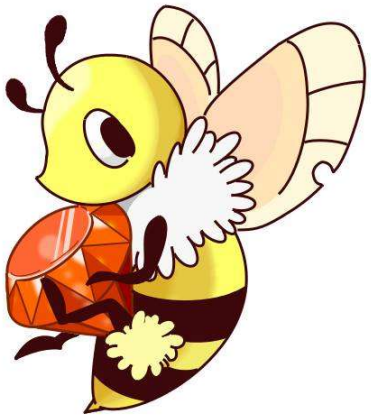


Smalruby

(smɔ ´ːrúːbi)

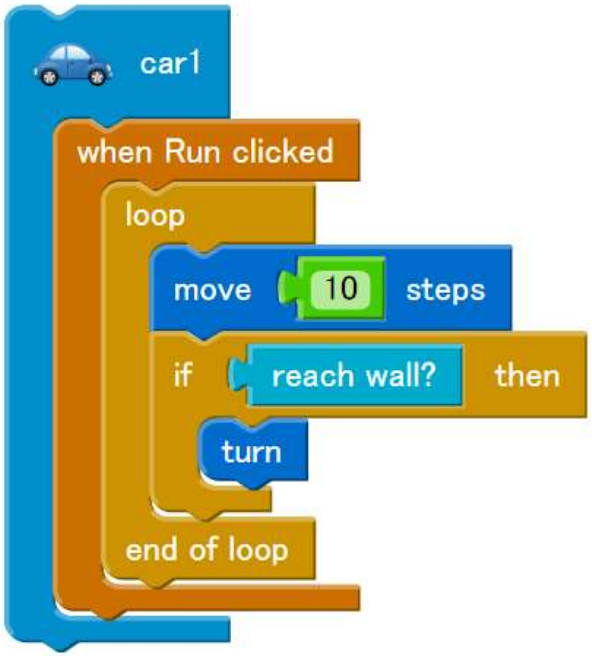
GitHub:
smalruby/smalruby-editor

Scratch Features



- Instruction Blocks
- Characters and Stages
- Easy to Run

Instruction Block

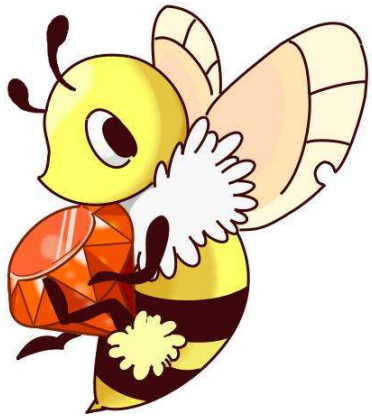



```
3  car1 = Character.new
4
5  car1.on(:start) do
6    loop do
7      move(10)
8      if reach_wall?
9        turn
10     end
11   end
12 end
```

Ruby

Ruby

```
move(10)
```



Instruction Block

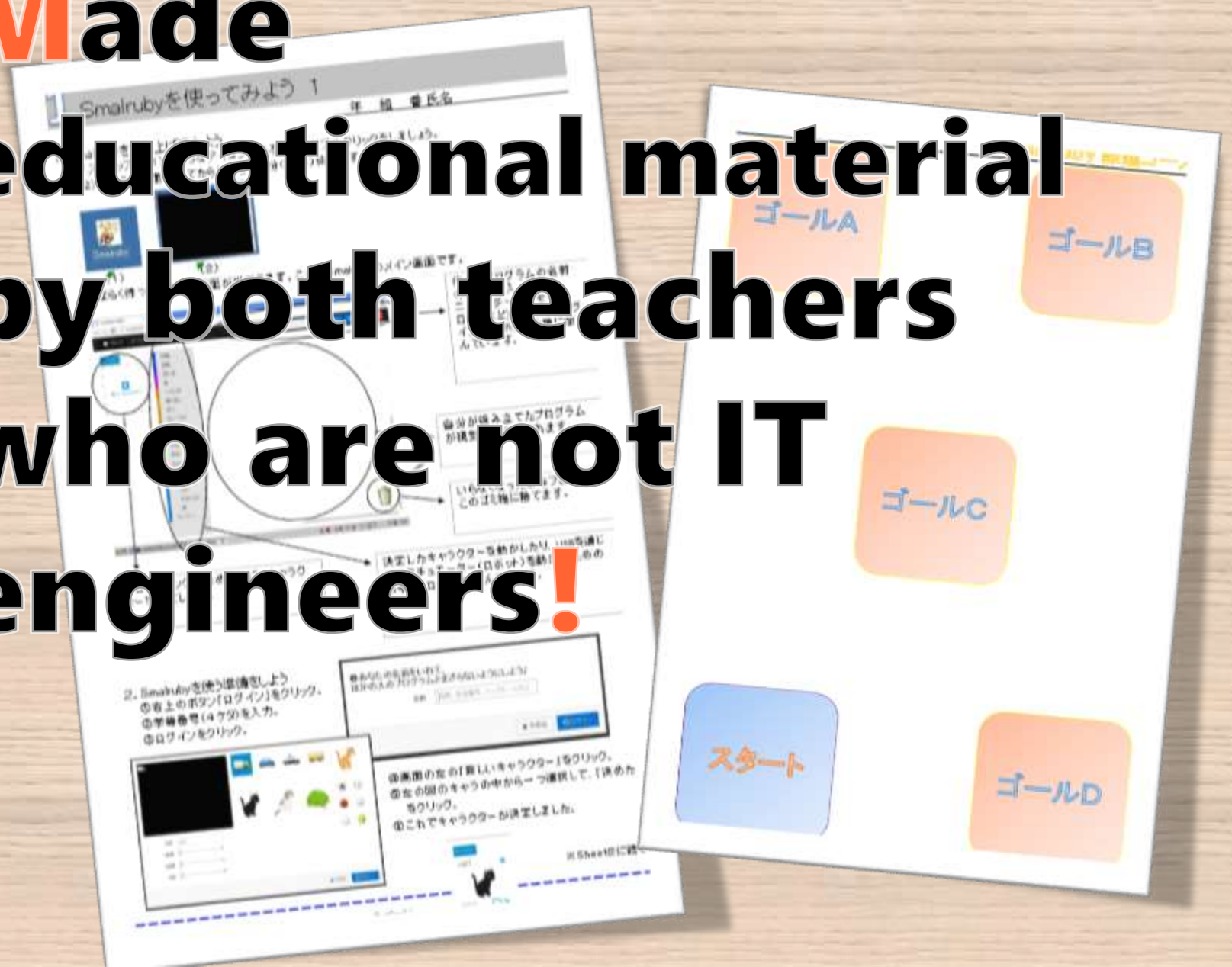
KIDS WANTED TO
CODE DIRECTLY!

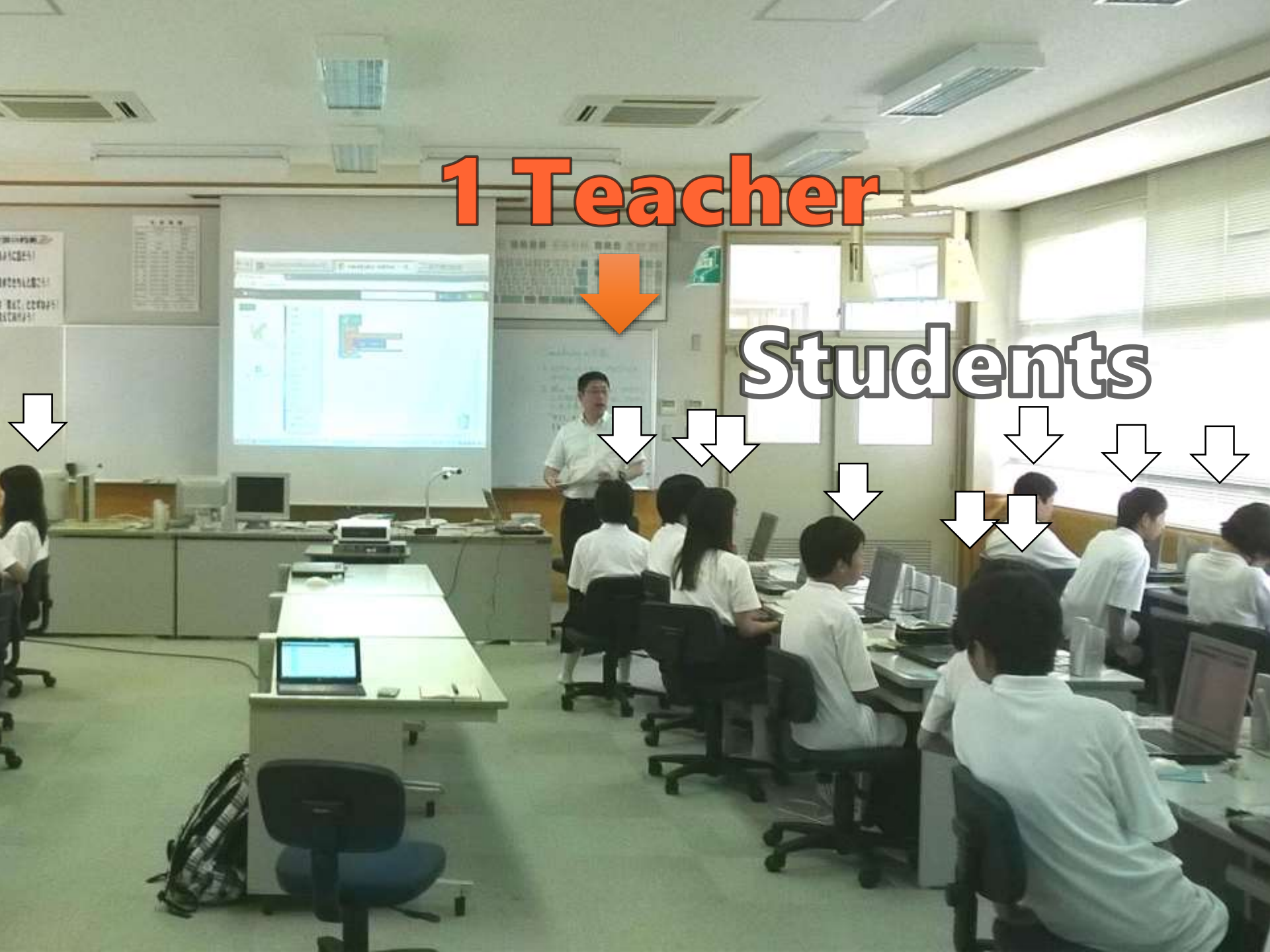
Vim Icon : http://www.vim.org/index.php
Emacs icon : http://ochiailab.blogspot.jp/2013/04/powerlineelemacs.html
Sublime Text icon : http://blog.livedoor.jp/nonprofessional/archives/1004031653.html

Now

Photo from http://business.nikkeibp.co.jp/article/report/20141001/271963/

Made educational material by both teachers who are not IT engineers!




1 Teacher
Students

MATSUE CITY

Ruby classes in whole municipal Junior high school

By 09.04.2014/local news paper(Sanin Chuo Shinpo)

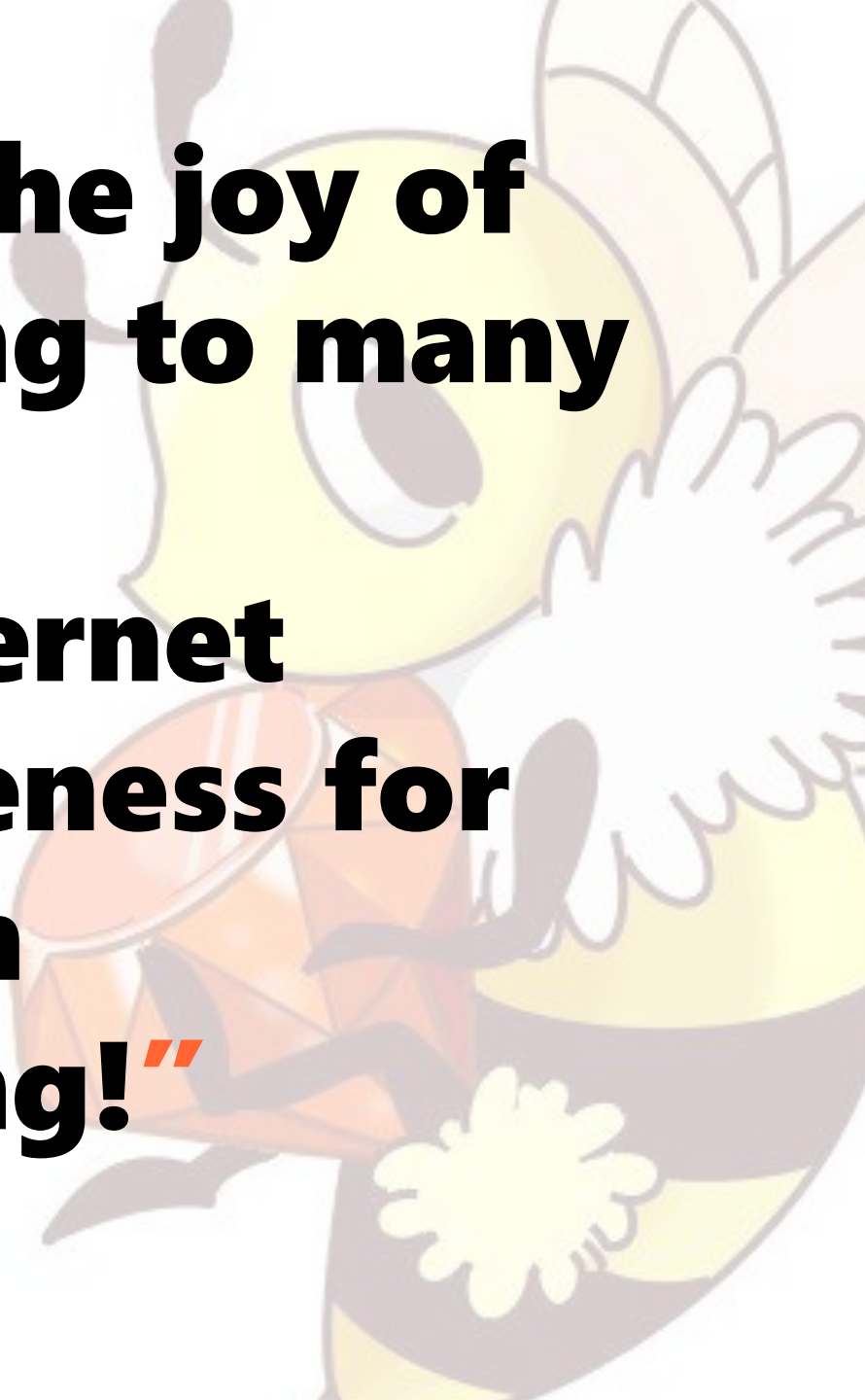
91%

Junior high school students will Learn Ruby

The Ruby Programming Shounendan

"Promoting the joy of programming to many kids. "

"Building internet safety awareness for kids through programming!"



Ruby programming
events for kids
and parents
Introducing Ruby,
once a month

Bayern München

MASSIVE

CoderDojo Matsue

https://coderdojo.com

Free Ruby computer programming club for Kids, once a month

Ruby Programming Shounendan

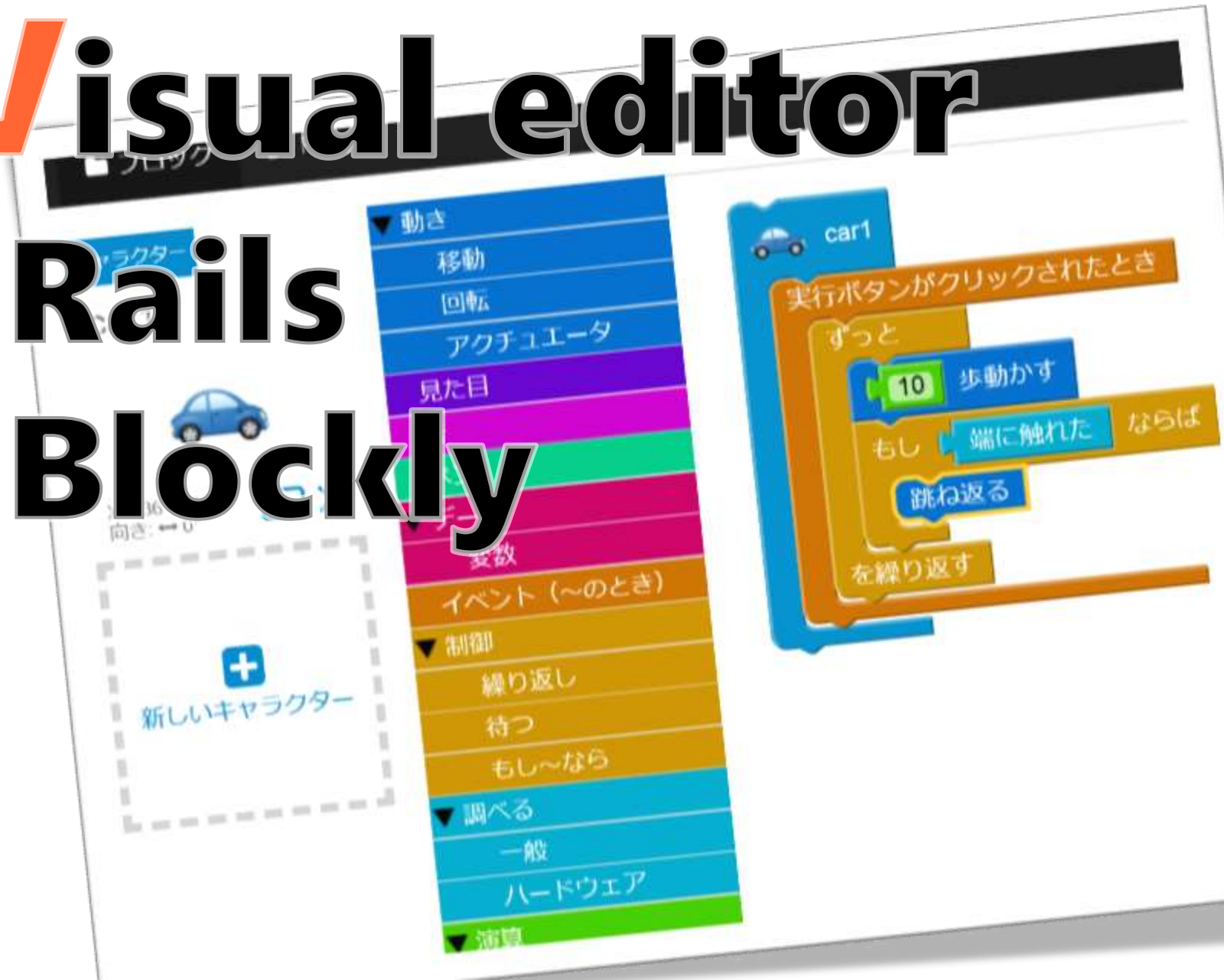
≒

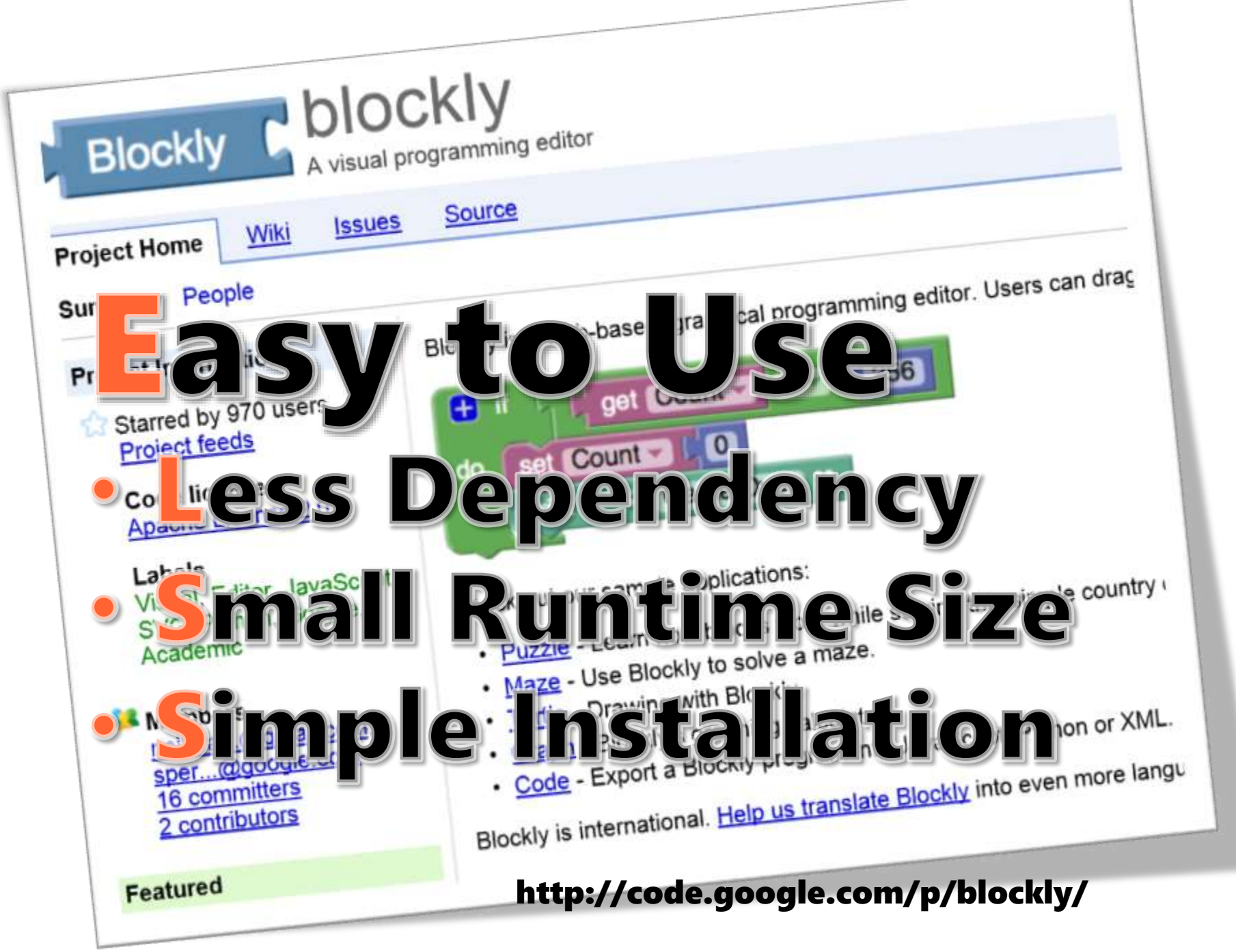
Youth Sports Club

Welcome
Developers
GitHub:
smalruby/smalruby-editor

Visual editor

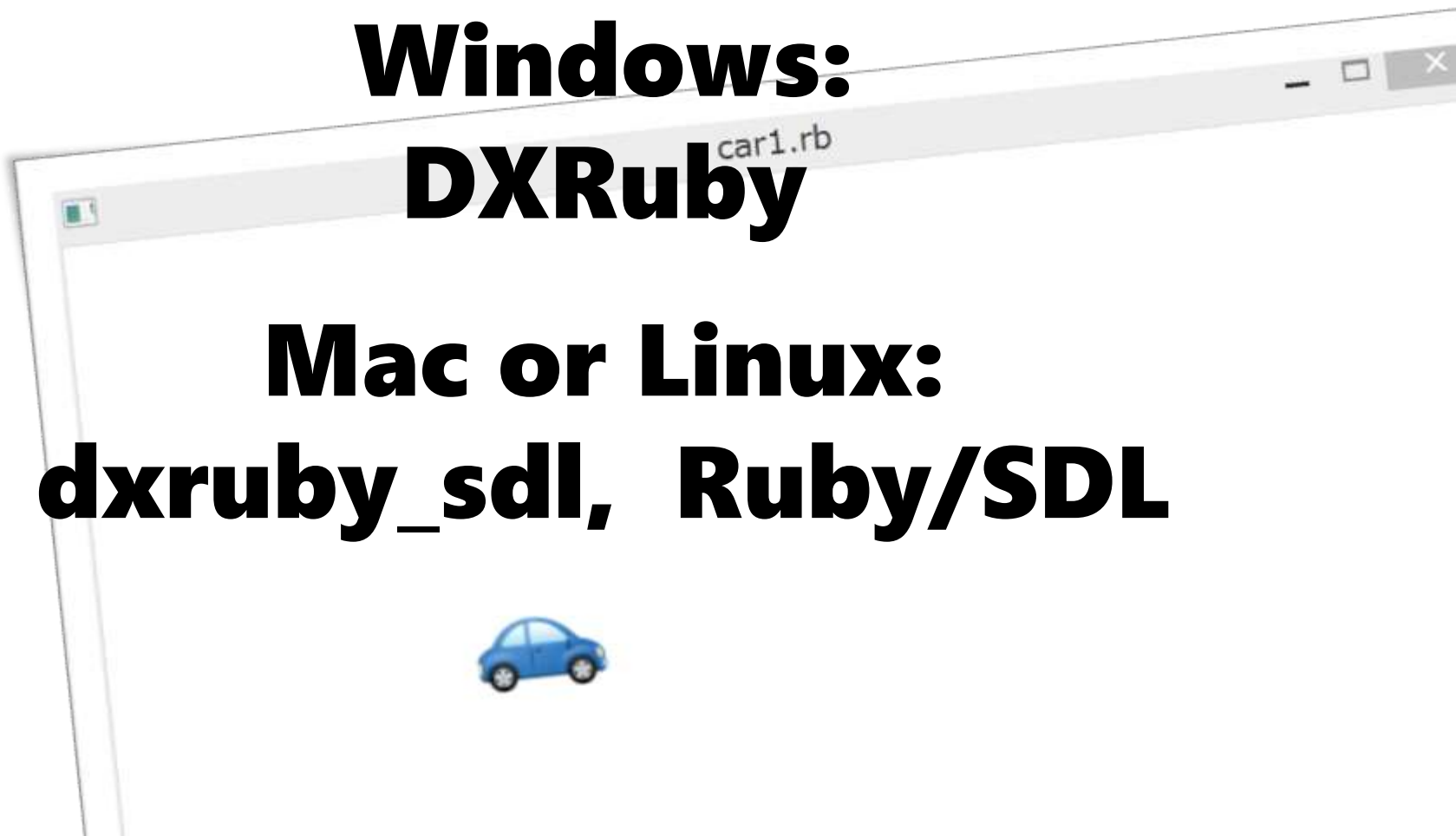
- Rails
- Blockly




Blockly
blockly
A visual programming editor
Project Home
Wiki
Issues
Source
People
Starred by 970 users
Project feeds
Labels
Academic
16 committers
2 contributors
Featured
Puzzle - Use Blockly to solve a maze.
Maze - Use Blockly to solve a maze.
Code - Export a Blockly program
Blockly is international. Help us translate Blockly into even more langu
get Count
set Count 0
Easy to Use
Less Dependency
Small Runtime Size
Simple Installation
http://code.google.com/p/blockly/

Runtime

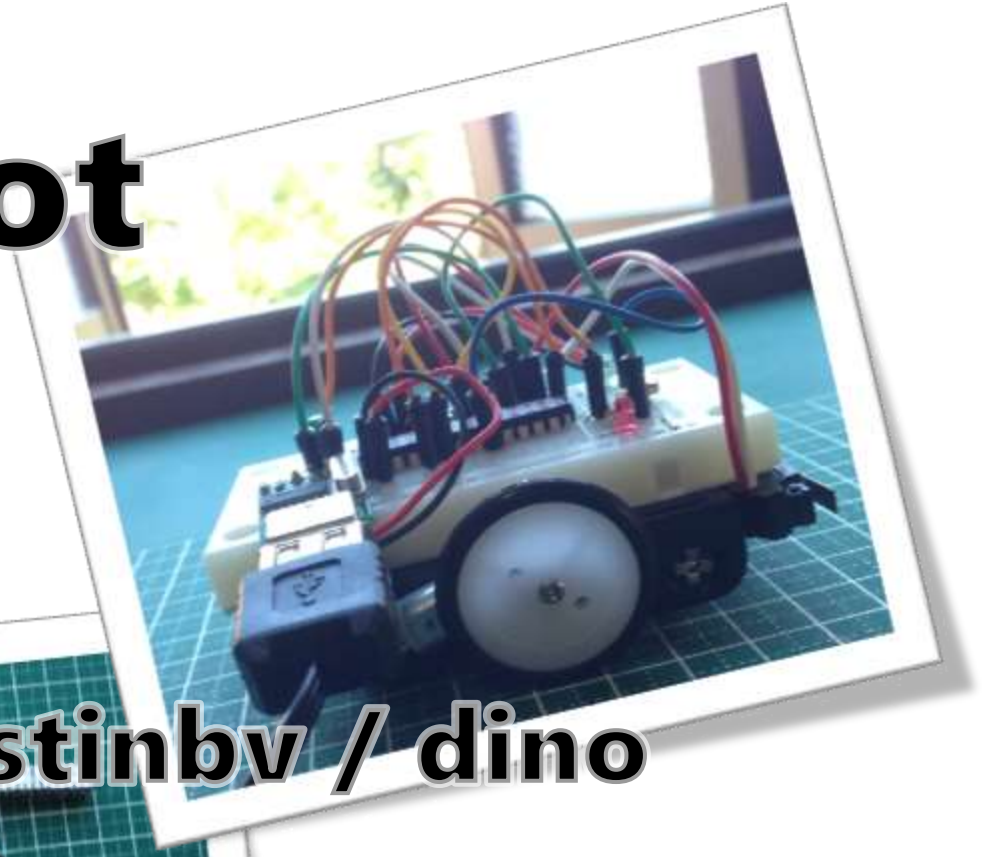
Windows:
DXRuby

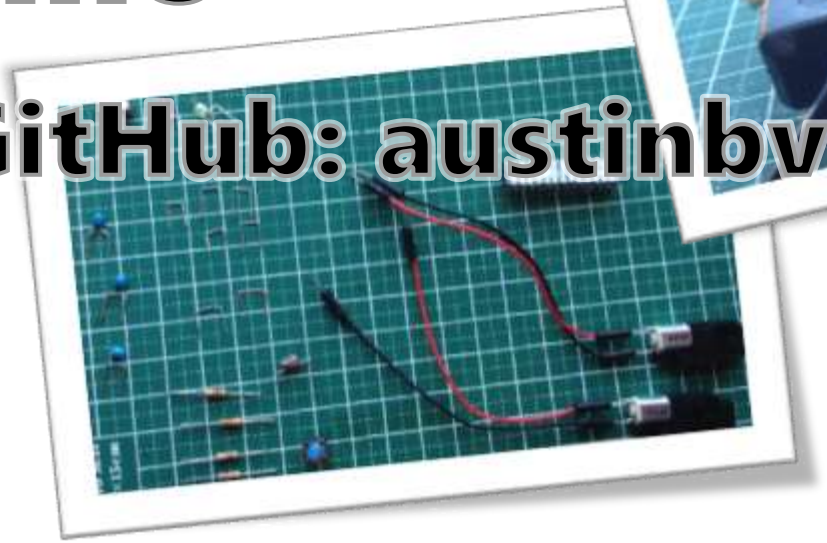


Mac or Linux:
dxruby_sdl, Ruby/SDL

Smalrubot

- Arduino
- Dino





GitHub: austinbv / dino

Define Instruction Block

```
Blockly.Blocks['motion_move'] = {
  init: function() {
    this.setColour(208)
    this.interpolateMsg('move %1 steps',
      ['STEP', ['Number'], Blockly.ALIGN_RIGHT],
      Blockly.ALIGN_RIGHT);
    this.setInputsInline(true)
    this.setPreviousStatement(true)
    this.setNextStatement(true)
  }
};
```

/app/assets/javascripts/blocks/motion.js.coffee.erb

Generate Ruby from Block

```
Blockly.Ruby['motion_move'] =
function(block) {
  var arg =
    Blockly.Ruby.valueToCode(this,
      'STEP',
      Blockly.Ruby.ORDER_NONE);
  return 'move(' + arg + ')';
};
```

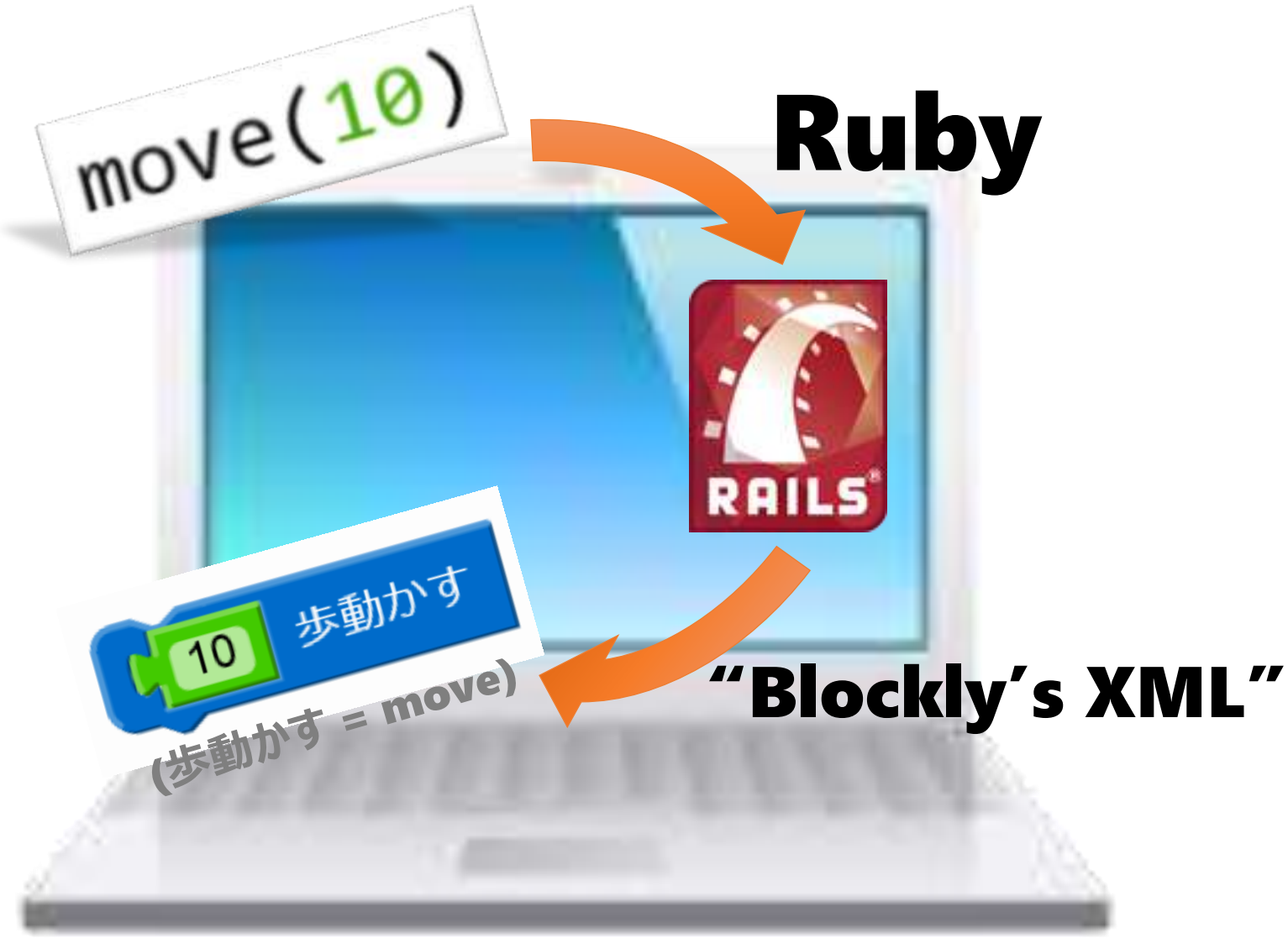
/app/assets/javascripts/blocks/motion.js.coffee.erb

Ruby

```
move(10)
```

Instruction Block

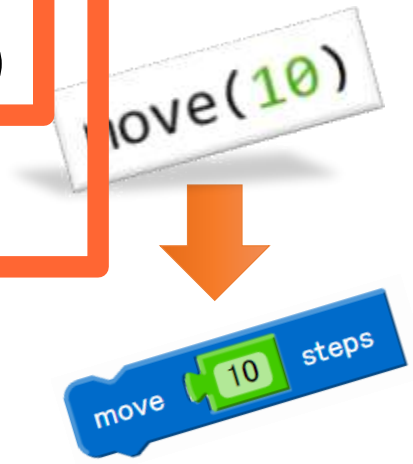
(歩動かす = move)


move(10)
Ruby
RAILS
10
歩動かす
(歩動かす = move)
“Blockly’s XML”

Translate Block from Ruby

```
class MotionMove < CharacterMethodCall
  blocknize '^¥s*' + CHAR_RE + 'move¥((.+)¥)¥s*$',
                statement: true, inline: true

  def self.process_match_data(md, context)
    md2 = regexp.match(md[type])
    add_character_method_call_block(
      context, md2[1], new, STEP: md2[2])
    true
  end
end
```



Conclusion

- Teaching Ruby Motivations
  - Ruby City MATSUE Project
  - TEACH MY SON RUBY
- Smalruby
  - For over 8 years old
- Ruby Programming Shounendan
  - Learning Ruby Organization for Boys & Girls

I believe that people should focus on creating tools to help everyone.

“Facing problems and looking for the answer that will solve them” is a very important.

I sympathize with everyone here and …

I’m glad that we are all somehow involved with OSS development.

Ruby is

A Programmer's Best Friend

AND KIDS!

THANK YOU

Smalruby (smɔ´ːrúːbi)

GitHub: smalruby/smalruby-editor
Email: contact@smalruby.jp
Twitter: @smalruby