mruby/c: IoT system for 👍 SAKE brewery 👍

HASUMI Hitoshi @hasumikin

Monstar Lab

SWEST21 ♨♨♨ 下呂温泉 水明館

Sep. 6, 2019

Me

- HASUMI Hitoshi
  @hasumikin
- Matsue city,
  a holy place of Ruby
- Sake 🍶
  Soba 🍜
  Coffee ☕

MONSTARLAB

GROUP

Global Sourcing

Strength: Planning, Design, Marketing, Project Management, Development, Testing
Languages: Japanese, English
Development Languages: Ruby, Java, PHP, HTML/CSS, JavaScript, Swift, Objective C

JAPAN

TOKYO/OSAKA/MATSUE/FUKUOKA

VIETNAM

DANANG/HANOI

Strength: Mobile App Development (iOS,Android)
Languages: Japanese, English, Vietnamese
Development Languages: PHP, Java, Ruby, iOS,Android, Swift

BANGLADESH

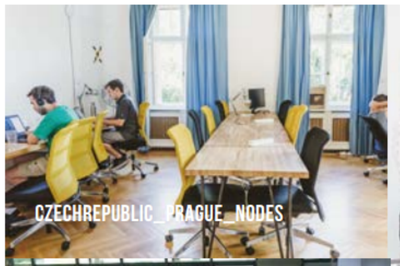
DHAKA

Strength: Web Development
Languages: English, Japanese, Bengali
Development Languages: Java, PHP, JavaScript, Swift, Objective C

CHINA

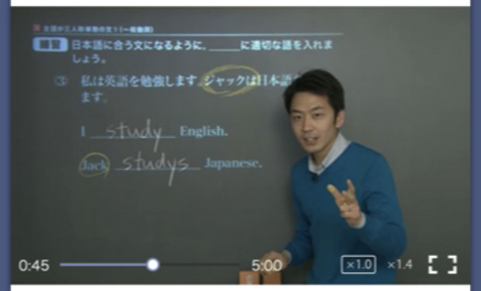
BEIJING/SHANGHAI
QINGDAO/CHENGDU

Strength: Game Development
Languages: Japanese, English,Chinese
Development Languages: Java, JavaScript, PHP, iOS, Android



ワナラナイ

中学1年生　英語　通常学習編
NEW HORIZEN（東京書店）



be動詞の文（主語が this,that の時）

学習済にする　BOXに入れる　使い方

いつ学習済みにする？

確認テスト　問題をみる　解答をみる

この授業の前後の授業

前の授業　続きの授業

映像授業　My BOX　Try IT履歴　メニュー

中学1年生　英語　通常学習編
NEW HORIZEN（東京書店）

Unit 1 あいさつをしよう

Unit 2 教室を案内しよう

be動詞の文（主語が this,that の時）

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Unit 1 あいさつをしよう

映像のことでも、学校や塾のことでも、
シェイクすることで何でも質問できます。

be動詞の疑問文（主語が this,this の時）

わからない × 0

中学1年生　英語　通常学習編
NEW HORIZEN（東京書店）

Unit 1 あいさつをしよう

be動詞の疑問文（主語が this,this の時）

わからない × 0

教科書設定

英語　NEW HORIZEN 東京書店

数学　新しい数学 東京書店

- 標準
- 新しい数学（東京書店）
- 数学の世界（東京書店）
- 中学校　数学（学校図書）
- 中学数学（教育出版）
- 未来へ広がる数学（啓林館）
- 中学校数学（数研出版）
- 中学数学（日本文教出版）

理科　新しい理科 東京書店

地理　新しい地理 東京書店

歴史　新しい歴史 東京書店

公民　新しい公民 東京書店

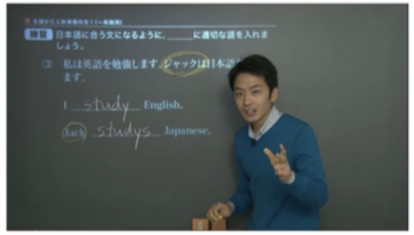
国語　新しい国語 東京書店

教科書設定の保存

英語：三単現のsがわかりません。ど…

あなたの質問　2015/04/25/金 15:00

三単現の s がわかりません。どうして s がつくのですか？三人称と二人称のちがはなんですか？



トライさん　2015/04/25/金 15:00

夜遅くの勉強お疲れ様です！頑張っていますね。
明日の12:00には回答できるようにしますね！

自動返信

トライさん　2015/04/26/土 12:10

この場合の、駅は station か a station か the station のどれが適切ですか？
正解は、the station です。 station は数えられる名詞（＝可算名詞）です。数えられる名詞は必ず a か the か -s をつけるものだと覚えておきましょう。

解決済み

授業一覧　My BOX　質問　学習状況　その他

Matsue.rb

旭日酒造

- one of the best Japanese Sake brewery
- Asahi-shuzo and I make an IoT system using mruby/c

Asahi-shuzo

mruby/c

- 旭酒造(Asahi-shuzo), Yamaguchi: 獺祭(Dassai). fruity, aromatic and sweet
- 朝日酒造(Asahi-shuzo), Niigata: 久保田(Kubota). clear, dry and sharp
- 朝日酒造(Asahi-shuzo), Fukui: ???
- 旭日酒造(Asahi-shuzo), Shimane: **十旭日(Juji-Asahi)**. tasteful, mature with years and good for お燗(warmed style)

What is mruby/c?

mruby/c

What is mruby/c?

mruby/c

- github.com/mrubyc/mrubyc
- yet another implementation of mruby
- `/c` symbolizes compact, concurrent and capability
- especially dedicated to one-chip microcontroller

mruby and mruby/c

mruby/c

mruby	mruby/c
v1.0.0 in Jan 2014	v1.0 in Jan 2017
for general embedded software	for one-chip microcontroller
RAM < 400KB	RAM < 40KB

About my IoT project

mruby/c

- IoT system for Asahi-shuzo
- delivered to actual brew work in January 2018
- devices post temperature of Sake materials in brewing, surrounding temperature and humidity to server
- data is displayed on smartphone app

About my IoT project

What is "taking temperature" ?

what is "taking temperature" ?

mruby/c

what is "taking temperature" ?

mruby/c

1st season (2017BY)

mruby/c

1st season (2017BY)

mruby/c

before mruby/c

1st season (2017BY)

1st season (2017BY) architecture

mruby/c

- sensortags ->(BLE)-> gateway
- gateway ->(WiFi)-> router
- router ->(3G)-> internet

1st season (2017BY) architecture

mruby/c

- sensortags ->(BLE)-> gateway
- gateway ->(WiFi)-> router
- router ->(3G)-> internet

Having a stack of multiple wirelesses is so hard

1st season (2017BY) architecture

1st season (2017BY) architecture

mruby/c

超えられない壁

1st season (2017BY) architecture

mruby/c

- a thick wall
  - BLE couldn't through the wall
- water everywhere
- power suppply issue
  - number of instrument should be minimized

BY?

mruby/c

BY?

mruby/c

- Brewing Year, from July to June
- in Asahi-shuzo a BY work starts on November and finishes on April (depends on year)

2nd season (2018BY)

mruby/c

2nd season (2018BY)

mruby/c

A NEW HOPE

2nd season (2018BY)

mruby/c

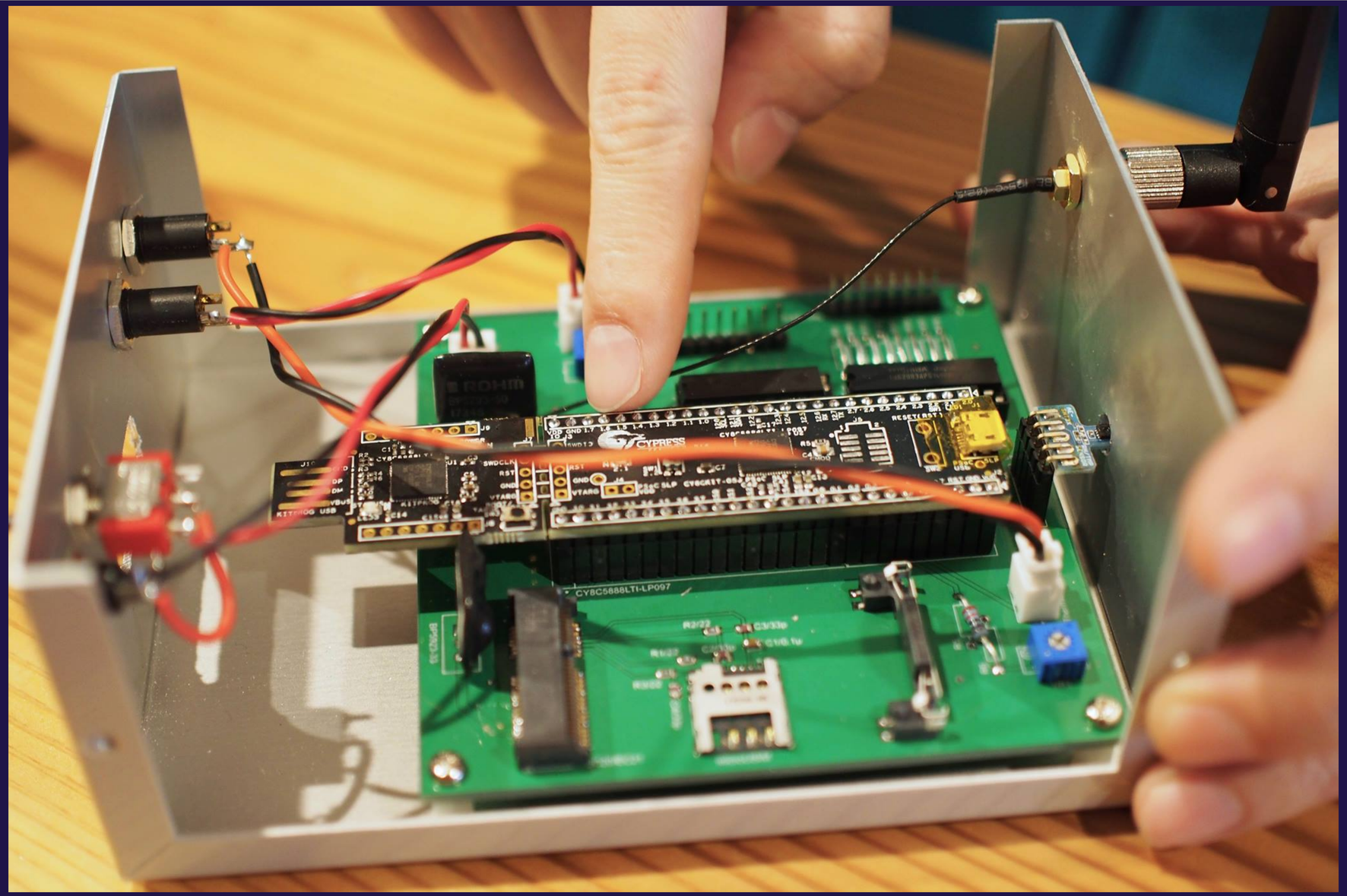
m r u b y / c

2nd season (2018BY) architecture

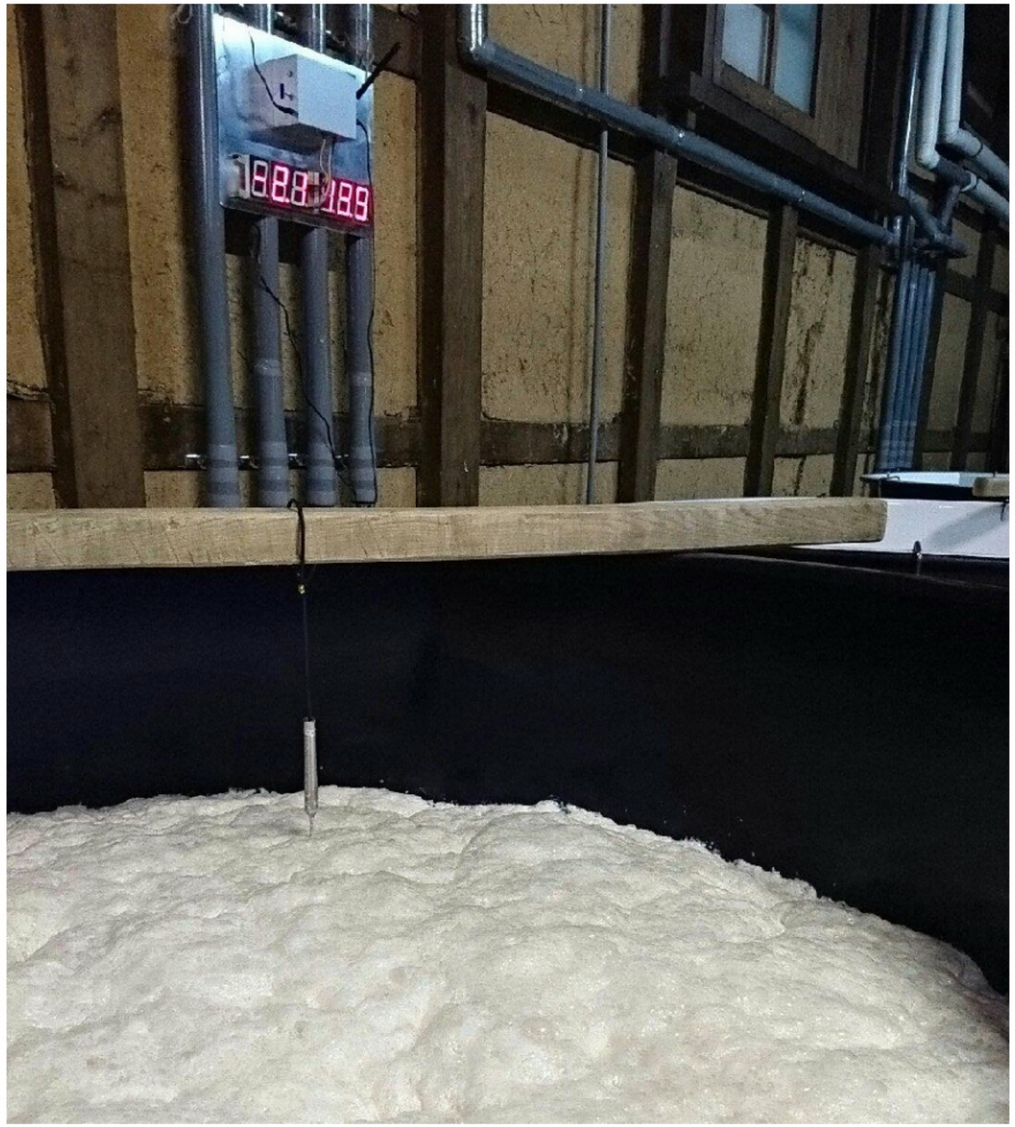
mruby/c

devices ->(3G)-> Internet

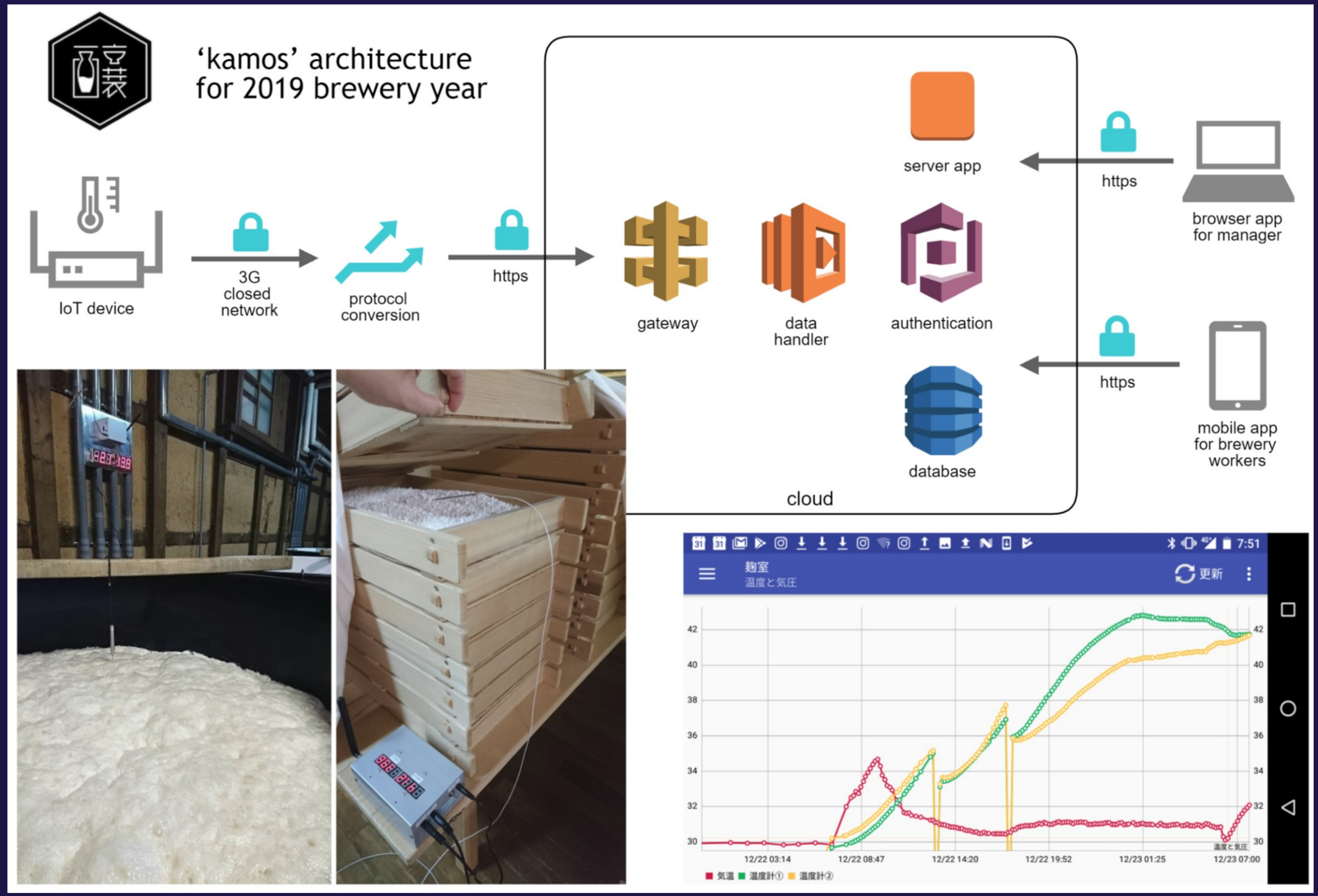
2nd season (2018BY) the device



2nd season (2018BY) architecture



2nd season (2018BY) architecture



2nd season (2018BY) mruby/c

mruby/c

- mruby/c does everything
  - sensors - I2C, ADC
    - Fixnum, Float, Math
  - 7seg LED display - transistor array
    - String, Mutex
  - 3G communication module - UART
    - String, flow control

2nd season (2018BY)

mruby/c

what were difficult about mruby/c?

- we can neither do step execution nor look into appropriate memory address of mruby/c's variables
- so many troubles in IoT
  - hard to find why the application doesn't work well

2nd season (2018BY)

mruby/c

what were difficult about mruby/c?

- mruby/c was growing
  - bugs, lack of features, docs and examples

2nd season (2018BY)

mruby/c

so, was mruby/c bad?

2nd season (2018BY)

mruby/c

so, was mruby/c bad? - NO

- IoT at work makes you hurry
  - you have to go back and forth between dark 10℃ storage cellar and humid 35℃ manufacturing room
  - you have to amend your firmware with your small laptop in 10 minutes
  - you will thank Ruby's descriptiveness and agility

mruby/c
Firmware Programming with mruby/c
HASUMI Hitoshi
Monstar Lab, Matsue office
2018/6/1
RubyKaigi2018@Sendai International Center

3rd season (2019BY)

RubyKaigi 2019

mruby/c

MONSTARLAB

Practical mruby/c firmware development with CRuby

HASUMI Hitoshi @hasumikin

RubyKaigi 2019
April 19, 2019
Fukuoka International Congress Center

mruby/c

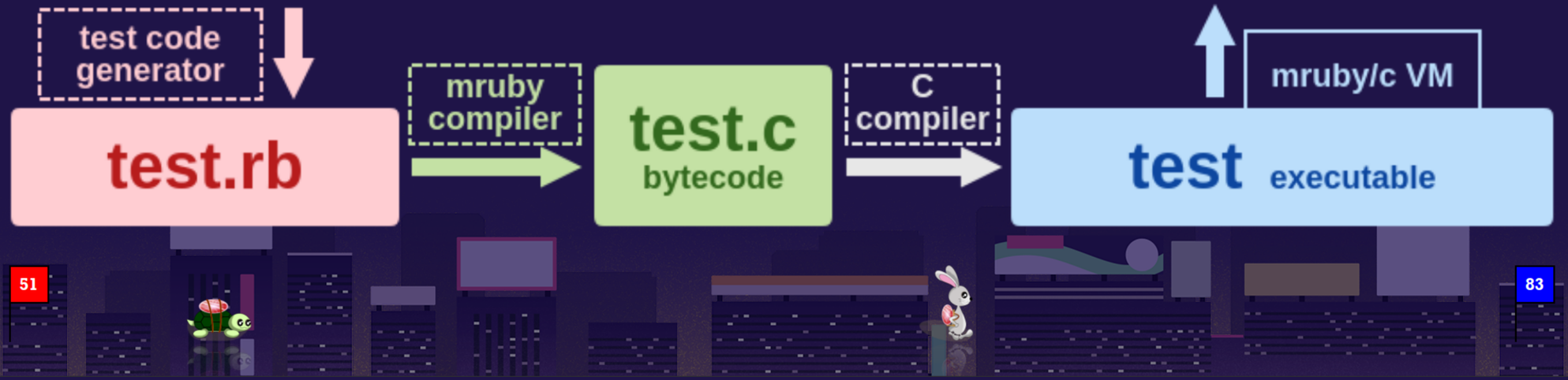
mrubyc-test.gem - internal

- the gist is creating **test.rb** by `test code generator` implemented in CRuby

```
class Sample
  def hoge
    "fuga"
  end
end
```

```
class SampleTest < MrubycTestCase
  def some_case
    obj = Sample.new
    assert_equal obj.hoge, "fuga"
  end
end
```

```
SampleTest#some_case
  assertion : assert_equal
  result    : fuga
Finished
1 examples, 0 failures
```



Technology stack of IoT (1/2)

mruby/c

- TCP/IP
- cloud service
- RDB and KVS
- server programming
- mobile programming
- security
- test

Technology stack of IoT (2/2)

mruby/c

- high school physics electricity and transistor
- microcontroller and peripherals like UART, I2C, ADC, etc.
- circuit and PCB artwork
- soldering and wiring
- 3D CAD for housing
- suppliers
- firmware programming

Summary

mruby/c

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Summary

mruby/c

- mruby/c is a Ruby for microcontroller
- mruby/c runs on Asahi-shuzo
- mruby/c can be ensured by test
- mruby/c is ready

mruby/c

Thank you!