YEARLY PROJECT

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Source Code of the Slide

I. CHOOSE YOUR FIELDS

- Machine Learning
- Embedded Systems
- Web Applications
- Computer Graphics
- Operating Systems
- Distributed Systems
- Databases and Storage System
- Programming Language Theory
- ...

MACHINE LEARNING

- Video: Andrew Ng Machine Learning
- Frameworks: tensorflow, pytorch
- Computer vision: OpenCV(cv2), YOLOv3
- Not only Python (Maybe JS or Rust?)

EMBEDDED SYSTEMS

- Raspberry Pi: https://www.raspberrypi.org/
- Linux and Open Source
- The Rust Programming Language
  - Rust is blazingly fast and memory-efficient: with no runtime or garbage collector, it can power performance-critical services, run on embedded devices, and easily integrate with other languages.
  - Rust's rich type system and ownership model guarantee memory-safety and thread-safety — enabling you to eliminate many classes of bugs at compile-time.
  - Rust has great documentation, a friendly compiler with useful error messages, and top-notch tooling — an integrated package manager and build tool, smart multi-editor support with auto-completion and type inspections, an auto-formatter, and more.
  - The Embedded Rust Book | Chinese version

WEB APPLICATIONS

- Goals are important: what do people need?
- Front-end:
  - HTML, CSS, JavaScript → TypeScript
  - Framework/Library: Vue, React, Angular
  - Reactive, Functional: rxjs, elm, OCaml...
- Back-end:
  - RESTful API design, MVC
  - Frameworks: Node.js(express, nest), Java(Spring), Python(flask, django), Ruby(rails), elixir(phoenix)...
  - Databases: MySQL, PostgreSQL, MongoDB...
  - Container: Docker, Kubernetes...
- Mobile Apps:
  - Native: Java(Kotlin) for Android, Objective-C(Swift) for IOS
  - Hybrid: React Native, Flutter (go back to front-end)
- Desktop Apps: Cross-platform solution - QT, Electron...

COMPUTER GRAPHICS

- Rust implementation of “Ray Tracing in One Weekend”
- Games: Unity, UE4...

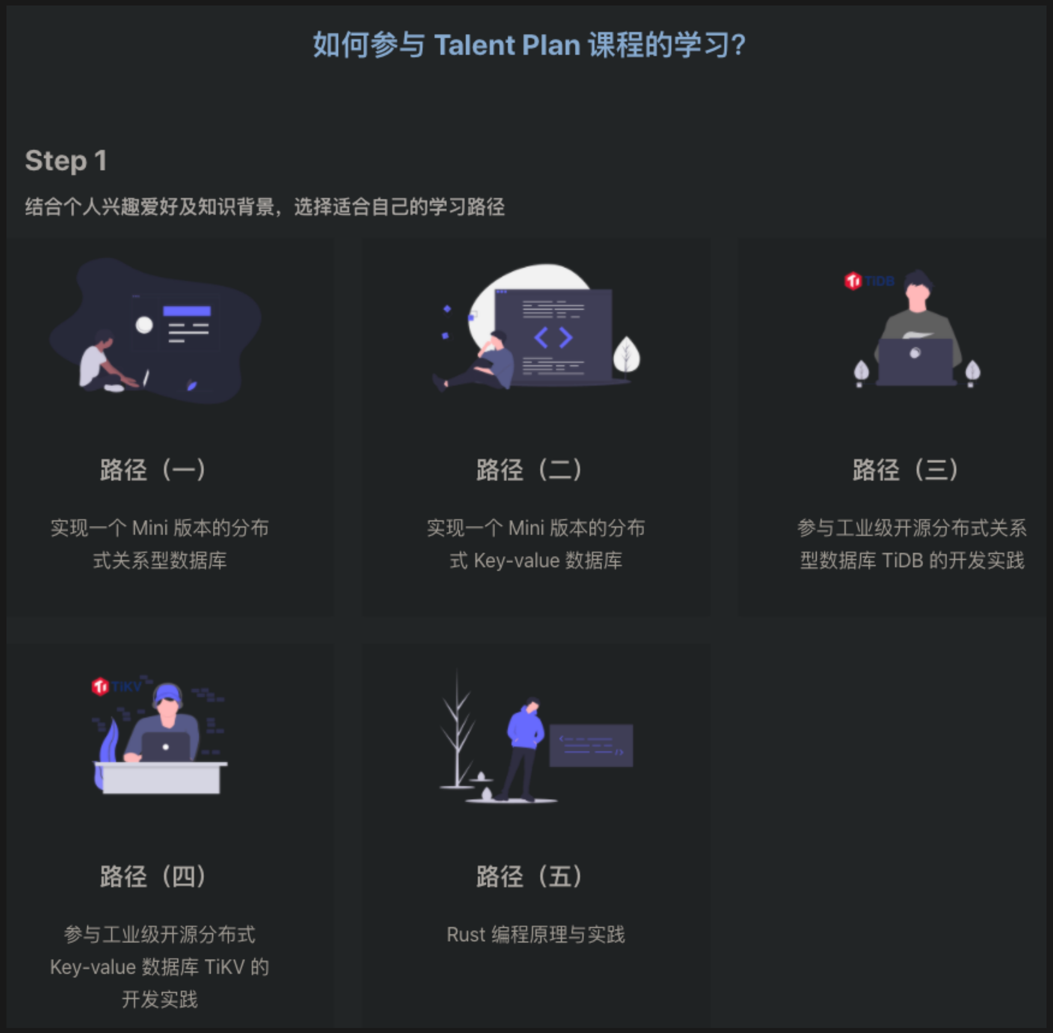
RAYTRACING

OPERATING SYSTEMS

- Tutorial for rCore OS step by step (2nd edition)
- Writing an OS in Rust - Philipp Oppermann's blog

DISTRIBUTED STORAGE SYSTEM

- MIT 6.824: Distributed Systems
- PingCAP Talent Plan: TiDB and TiKV


如何参与 Talent Plan 课程的学习?

Step 1

结合个人兴趣爱好及知识背景，选择适合自己的学习路径

路径（一）

实现一个 Mini 版本的分布式关系型数据库

路径（二）

实现一个 Mini 版本的分布式 Key-value 数据库

路径（三）

参与工业级开源分布式关系型数据库 TiDB 的开发实践

路径（四）

参与工业级开源分布式 Key-value 数据库 TiKV 的开发实践

路径（五）

Rust 编程原理与实践

PROGRAMMING LANGUAGE THEORY

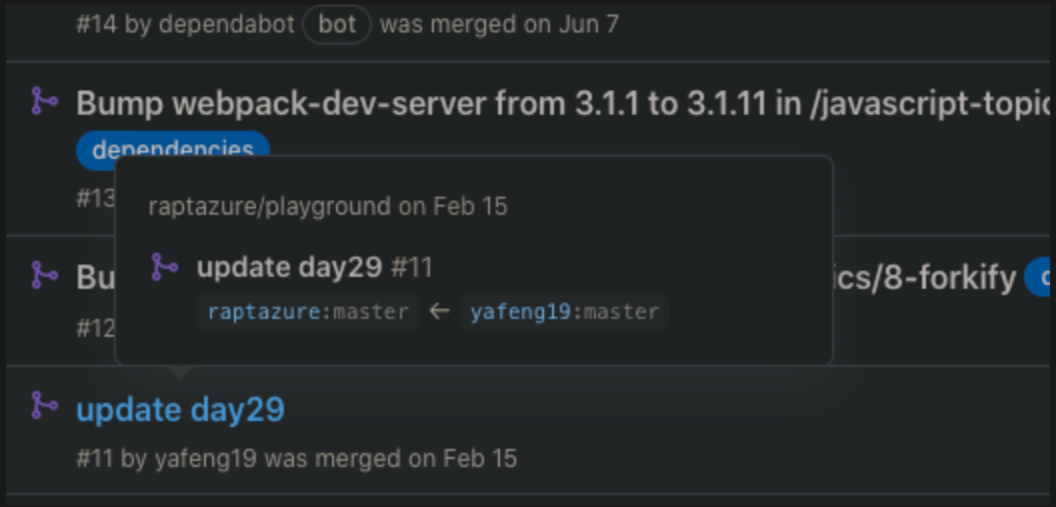
- SICP (MIT 6.001) and Computer Magic
- Functional programming: Haskell, Elixir, λ-calculus...
- Formal Proof: proof assistant → Agda, Arend...
- Type Theory: HoTT, CuTT, Dependent type → Agda, Idris...
- Implement a lisp/scheme interpreter using Haskell...
- Write a C compiler using Rust → ref: rcc
- Design your own programming language

II. ORGANIZE YOUR TEAM

- Open Source Workflow
- GitHub Project

OPEN SOURCE WORKFLOW

- Push your code to GitHub (using git)
- Pull Requests / Code Review
- Merge PR and work together
- Assistant: QQ Group



#14 by dependabot bot was merged on Jun 7

Bump webpack-dev-server from 3.1.1 to 3.1.11 in /javascript-topic

dependencies

#13

raptazure/playground on Feb 15

update day29 #11

raptazure:master ← yafeng19:master

Bu ics/8-forkify

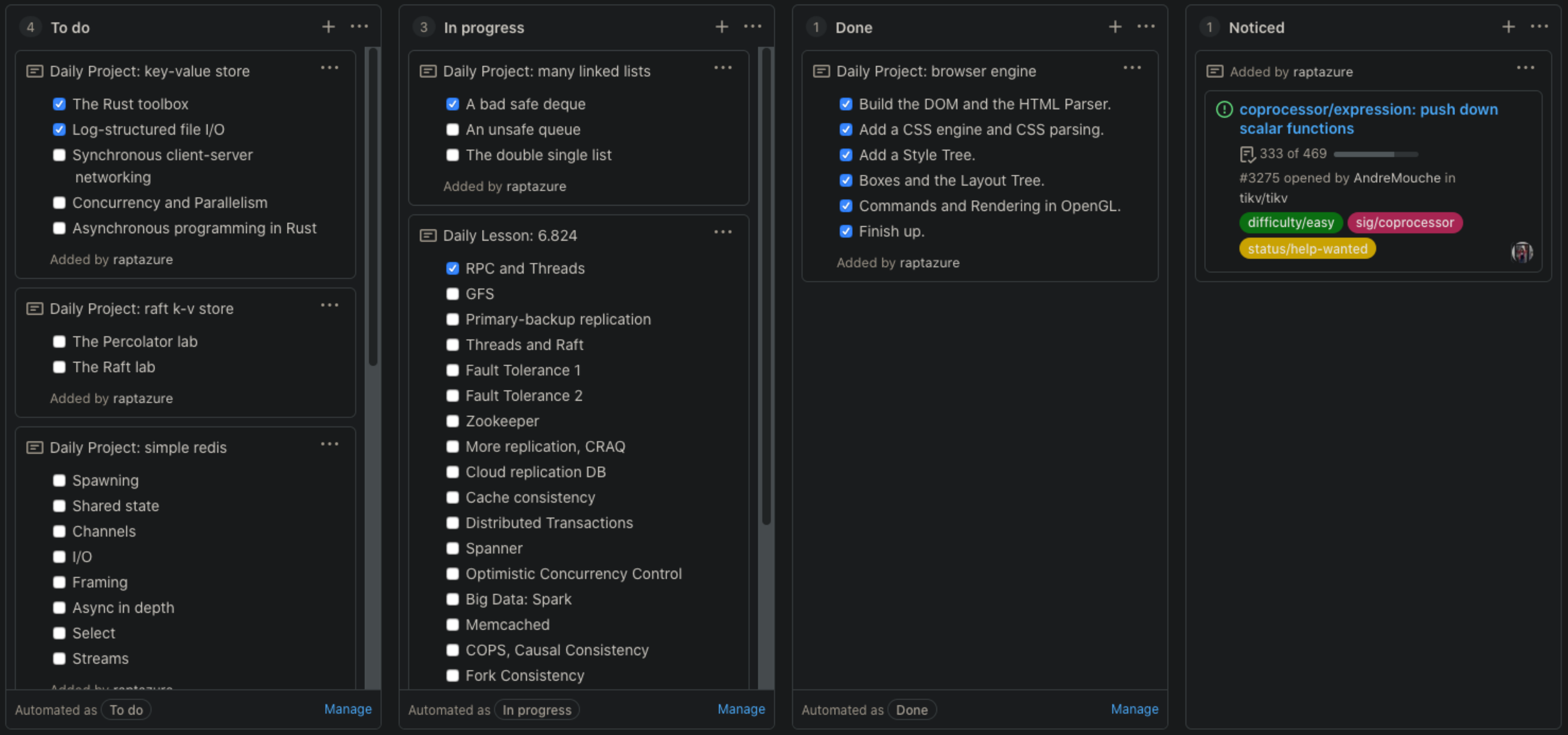
#12

update day29

#11 by yafeng19 was merged on Feb 15

GITHUB PROJECT

- Manage your progress
- Assign tasks to your team members



4 To do

Daily Project: key-value store
- ☑ The Rust toolbox
- ☑ Log-structured file I/O
- ☐ Synchronous client-server networking
- ☐ Concurrency and Parallelism
- ☐ Asynchronous programming in Rust

Added by raptazure

Daily Project: raft k-v store
- ☐ The Percolator lab
- ☐ The Raft lab

Added by raptazure

Daily Project: simple redis
- ☐ Spawning
- ☐ Shared state
- ☐ Channels
- ☐ I/O
- ☐ Framing
- ☐ Async in depth
- ☐ Select
- ☐ Streams

Automated as To do — Manage

3 In progress

Daily Project: many linked lists
- ☑ A bad safe deque
- ☐ An unsafe queue
- ☐ The double single list

Added by raptazure

Daily Lesson: 6.824
- ☑ RPC and Threads
- ☐ GFS
- ☐ Primary-backup replication
- ☐ Threads and Raft
- ☐ Fault Tolerance 1
- ☐ Fault Tolerance 2
- ☐ Zookeeper
- ☐ More replication, CRAQ
- ☐ Cloud replication DB
- ☐ Cache consistency
- ☐ Distributed Transactions
- ☐ Spanner
- ☐ Optimistic Concurrency Control
- ☐ Big Data: Spark
- ☐ Memcached
- ☐ COPS, Causal Consistency
- ☐ Fork Consistency

Automated as In progress — Manage

1 Done

Daily Project: browser engine
- ☑ Build the DOM and the HTML Parser.
- ☑ Add a CSS engine and CSS parsing.
- ☑ Add a Style Tree.
- ☑ Boxes and the Layout Tree.
- ☑ Commands and Rendering in OpenGL.
- ☑ Finish up.

Added by raptazure

Automated as Done — Manage

1 Noticed

Added by raptazure

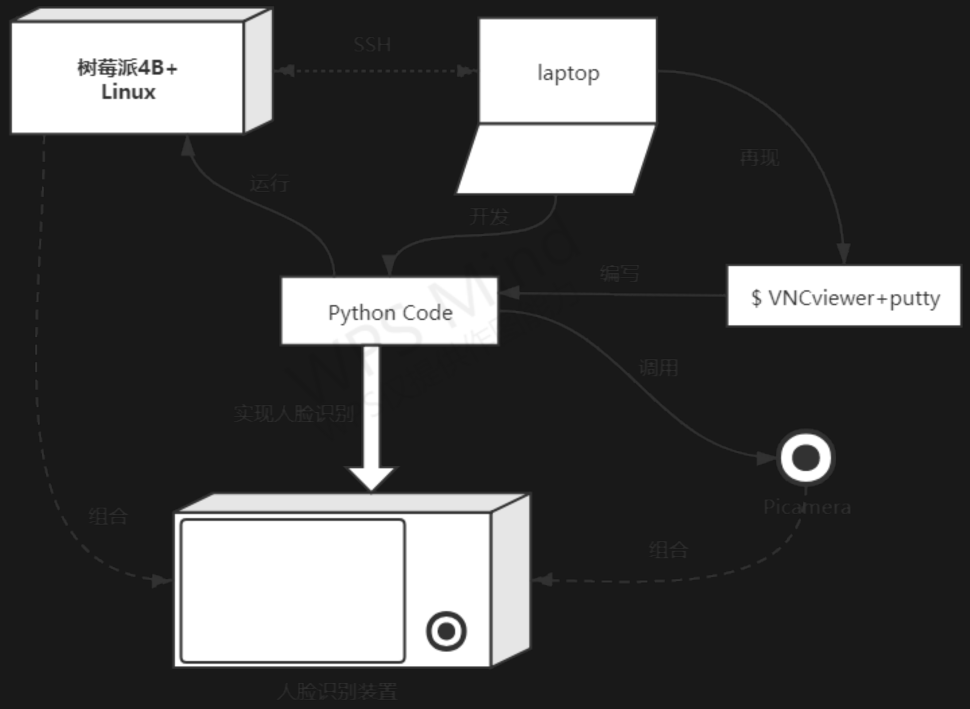
coprocessor/expression: push down scalar functions
333 of 469
#3275 opened by AndreMouche in tikv/tikv
difficulty/easy · sig/coprocessor · status/help-wanted

III. PRESENT YOUR IDEAS

- Creation and Presention

CREATION AND PRESENTION

- Everything creative: from your thoughts to the implementation...
- Show it to others: module graph & flowchart



THANK YOU!

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