

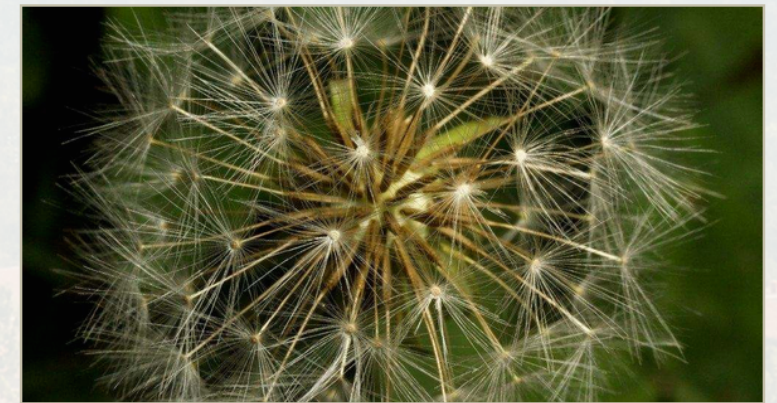


Introduction to Computer Networking

REGISTER FOR NETWORKING

EXPLORE COURSE *

This



DIRECT ACCESS COURSEWARE

Jason Bau

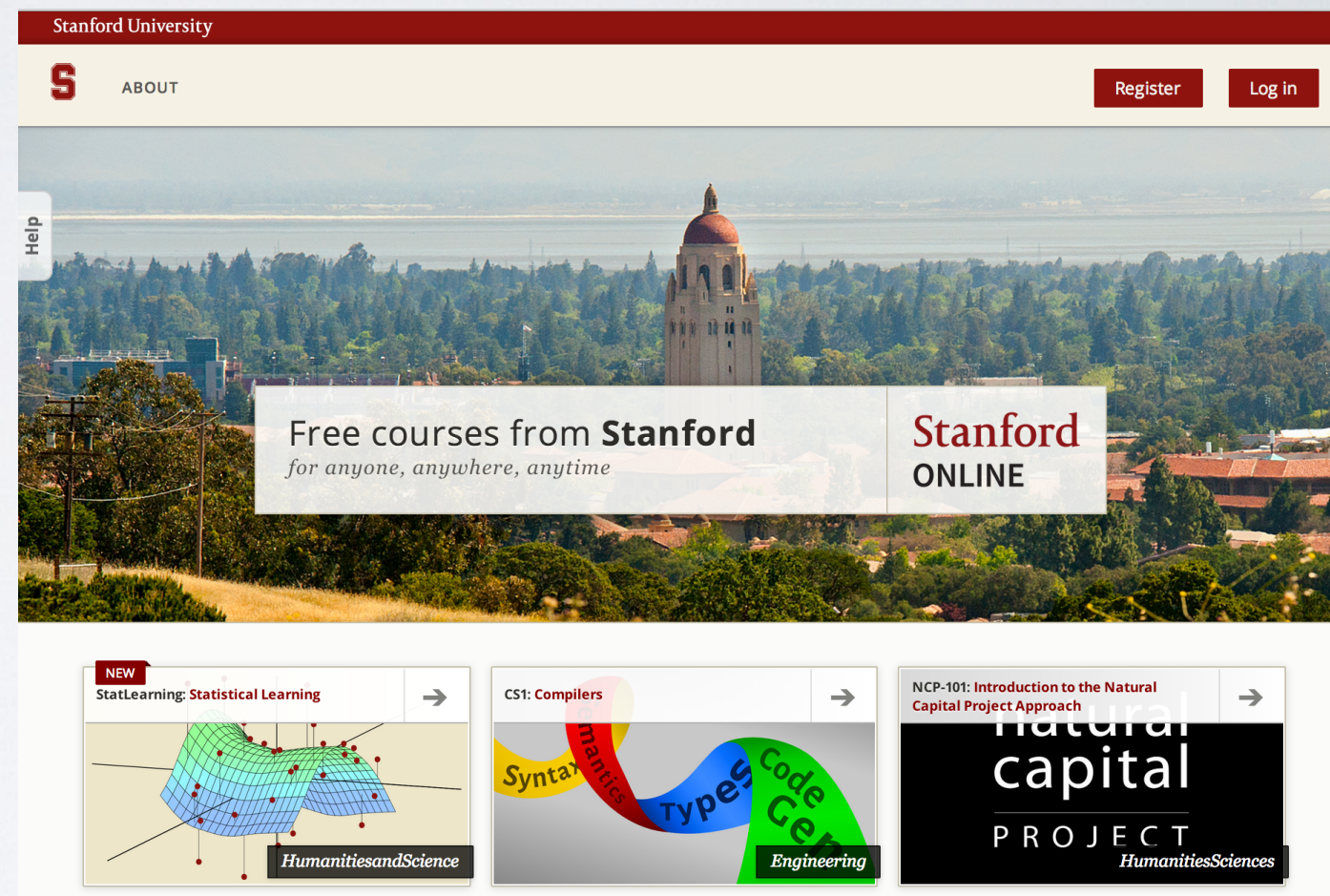
Open edX Engineering Manager

Vice Provost for Online Learning, Stanford University

STANFORD OPEN EDX

class.stanford.edu

- One of first instances
- One of largest instances (415K users, > 100 courses)
- ~10 person eng team
- github.com/Stanford-Online

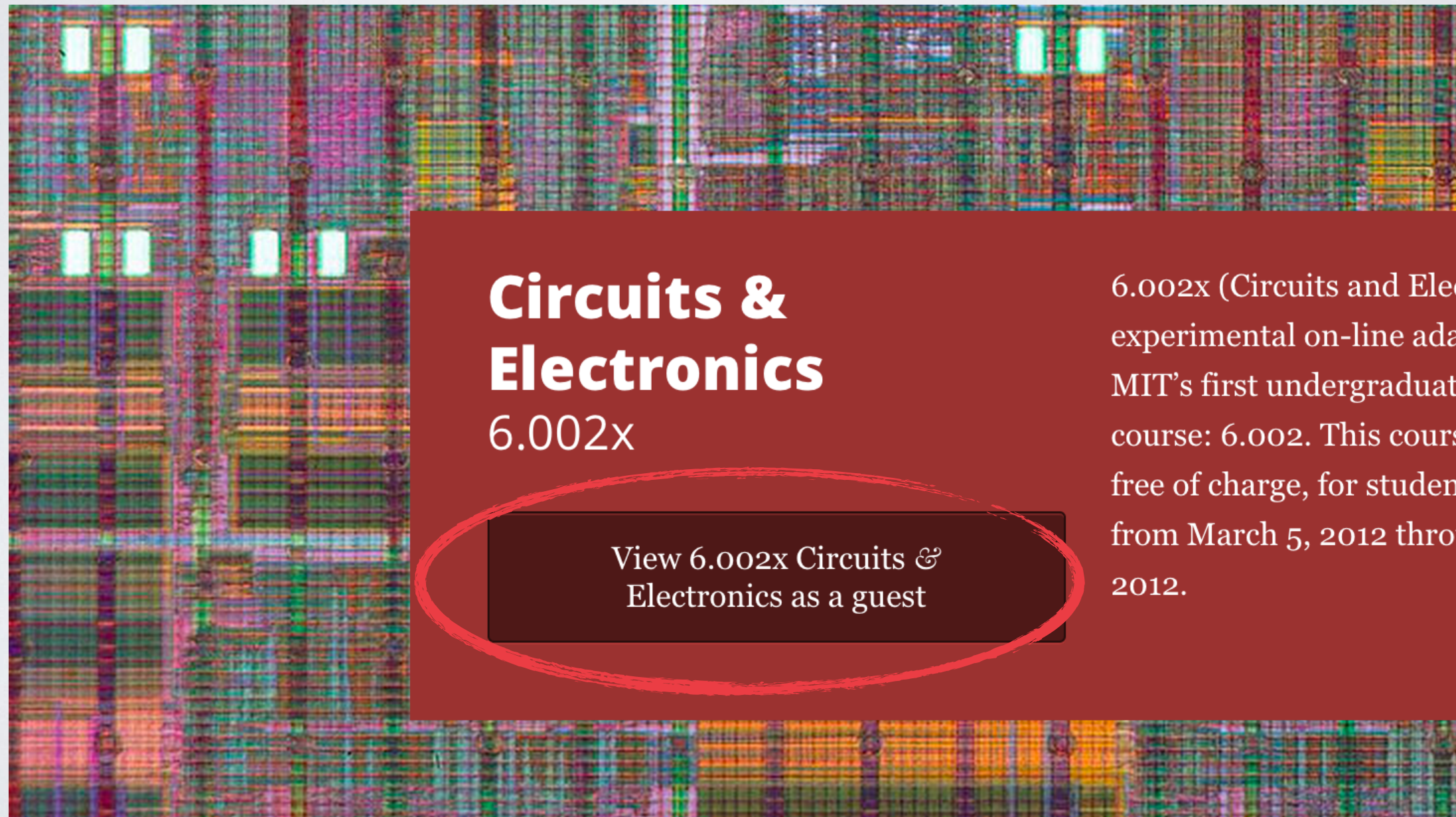


DIRECT ACCESS OUTLINE

- What and why?
- How?
- Data
- How to do it better

MAKE CONTENT ACCESS EASY!

no need to register



Circuits & Electronics
6.002x


[View 6.002x Circuits & Electronics as a guest](#)

6.002x (Circuits and Electronics) is an experimental on-line adaptive course, MIT's first undergraduate course: 6.002. This course is free of charge, for students from March 5, 2012 through 2012.

MAKE CONTENT ACCESS EASY!

no need to register


You've done your first addition within 1000 problem! [Sign up to save your progress](#) [\(close\)](#)

KHANACADEMY Subject: [3rd grade \(U.S.\)](#) ▾ About Donate **Log in**  [Unclaimed points](#) ▾

◀ **ADDITION AND SUBTRACTION**

Adding with regrouping within 1000


- ▶ Adding: base ten warmup
- ▶ Adding: three digit numbers
- ▶ Adding: why carrying works

⋮ Addition within 1000 Get the first 1 correct, or 3 in a row 

No login required

$$\begin{array}{r} 880 \\ + 40 \\ \hline \end{array}$$

Answer [Acceptable formats](#)

 [Awesome! Show points...](#)

We went without this on Open edX until we got loud pushback

- “We consider open access to our class material a critical part of the equation”
- “Someone who wants to view our course materials shouldn't have to have an edX login”
- “Is there a timeframe for making our content openly and freely available?”
- “. . . make the material easily available to our colleagues at other schools”

MAKE CONTENT ACCESS EASY!

deep linking without login gate / redirect

- Professor: Course syllabus page
- Professor: Email to colleague: Hey, feel free to use my lesson
- My Examples
 - https://6002x.mitx.mit.edu/courseware/6.002_Spring_2012/Week_1/Circuit_Analysis_Toolchest/ (also directly opens!)
 - https://www.khanacademy.org/math/cc-third-grade-math/cc-3rd-add-sub-topic/cc-3rd-adding-carrying/e/addition_4 (directly opens!)

HOPEFUL EXTENSIONS

- Embedding

- Search crawlers

- Google “networking class”, top result at class.stanford.edu

- Google “network security lecture video” ...

INTRODUCTION TO NETWORK SECURITY

An example: Eavesdropping

The diagram shows a network topology. On the left, a person labeled 'Alice' is connected to a laptop. A dashed line with a double-headed arrow labeled 'HTTP' connects Alice's laptop to a server labeled 'Amazon.com'. The path between them goes through a cloud representing the network, which contains a play button icon. An 'Attacker' character is positioned below the network cloud, with a red arrow pointing to the play button icon, indicating interception. The video player interface below the diagram shows a progress bar at 0:00 / 8:16, a speed control set to 1.0x, and a red 'Embed lesson' button circled in orange. To the right of the 'Embed lesson' button is a text input field containing the code '<iframe width="960" hε'. The video player also includes a 'Download video' button and a Creative Commons license icon.

CS144, Stanford University

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When we read about computer networks in the newspaper, it's often because they have been attacked or compromised. Almost every week we read about hackers breaking in and walking off with millions of credit card numbers and other private data, perhaps following a phishing attack or by exploiting some other vulnerability to access a supposedly private

SO LET'S DO THIS

simple principle

django distinguishes between `User` (profile info, row in db)
and `AnonymousUser` (pre-login)

just allow `AnonymousUser` everywhere in the code

probably the right way

EXCEPT...

registered “user” (with identity) is widespread assumption
edx-platform and xblocks

- LMS Access Control / Authorization

```
lms/djangoapps/courseware/access.py
```

- Enrollment

```
common/djangoapps/student/models.py: CourseEnrollment
```

- Just to render course content

```
lms/djangoapps/courseware/module_render.py
```

```
def get_module(user, request, ... )
```

STILL MORE “USER” NOTION

- needed for xblocks / xmodules to function is LMS:

```
mysql> desc courseware_studentmodule;
```

Field	Type	Null	Key	Default	Extra
id	int(11)	NO	PRI	NULL	auto_increment
module_type	varchar(32)	NO	MUL	NULL	
module_id	varchar(255)	NO	MUL	NULL	
student_id	int(11)	NO	MUL	NULL	

- xblock scopes:

```
class Scope(ScopeBase):  
    user_state = ScopeBase(UserScope.ONE, BlockScope.USAGE, u'user_state')  
    preferences = ScopeBase(UserScope.ONE, BlockScope.TYPE, u'preferences')  
    user_info = ScopeBase(UserScope.ONE, BlockScope.ALL, u'user_info')  
    user_state_summary = ScopeBase(UserScope.ALL, BlockScope.USAGE, ...
```

- tracking log emission

SOMETIMES WE WANT REGISTERED USERS

POST TYPE: Questions raise issues that need answers. Discussions share ideas and start conversations.

TOPIC AREA: Add your post to a relevant topic to help others find it.

Add a clear and descriptive title

B *I* | | |

Enter your question or comment...

Discussions

PREVIEW

follow this post

post anonymously

Add Post

Cancel

1 | Your Response

✓ COMPLETE

2 | Assess Peers

IN PROGRESS (0 OF 1)

Read and assess the following response from one of your peers.

ASSESSMENT # 1 OF 1

Peer Assessments

Andy Test

▼ DETERMINE IF THERE IS A UNIFYING THEME OR MAIN IDEA.

- | | | |
|----------------------------|---|----------|
| <input type="radio"/> Poor | Difficult for the reader to discern the main idea. Too brief or too repetitive to establish or maintain a focus. | 0 POINTS |
| <input type="radio"/> Fair | Presents a unifying theme or main idea, but may include minor tangents. Stays somewhat focused on topic and task. | 3 POINTS |
| <input type="radio"/> Good | Presents a unifying theme or main idea without going off on tangents. Stays completely focused on topic and task. | 5 POINTS |

THIS FEATURE NEEDS:

Hack

- Compatibility:

How to not break all the places that expect `User`

Let's just create dummy `Users` on demand, no reg required

- Policy:

Define what course content to show visitors

Let's just hardcode reasonable defaults

V 0.9

commit 3a4a1e948531716a3e06eca5d94fd140834f264d
Author: Jason Bau <jbau@stanford.edu>
Date: Thu Nov 21 01:52:26 2013 -0800

initial commit of sneak peek support for courses

- * some more tests
- * make preview work with shib classes
- * Styled unauth access button and banner.
 - renamed "preview" button to "Explore Course" and styled.
 - moved banner from main navigation to course navigation.
 - moved span tag inside link to make clickable area larger

Conflicts:

common/djangoapps/student/tests/factories.py
common/djangoapps/student/views.py
lms/djangoapps/courseware/tests/test_access.py

commit 1e5d7bd3ae718d2c9d5ec376f851e61621f1fe
Author: Giulio Gratta <giulio@giulio-gratta.com>
Date: Tue Dec 10 11:27:41 2013 -0800

adding unauthenticated use footer

commit b84f71f9705998db7cc58b414caaa9adcc8c50ee
Author: Giulio Gratta <giulio@giulio-gratta.com>
Date: Mon Jan 6 12:49:53 2014 -0800

Changes to Unauthenticated Access of courses

- Changed wording of footer in courseware
- Added footer to about page referenced to "Explore Course" button to make the course content "Click-Wrapped"

commit e2cc47317de8dfb9659b09a539d544c4efe8b9b0
Author: Jason Bau <jbau@stanford.edu>
Date: Wed Jan 22 09:31:01 2014 -0800

fixes visibility of can_load for sneakpeek

commit 3f2c4c73b2aa005a540a7a3e8e8d350e50b66d29
Author: Jason Bau <jbau@stanford.edu>
Date: Sun Mar 30 10:41:45 2014 -0700

changes to make sneakpeek work with new tabs

commit 232b7304df726ee1a4d5753d871841eeced017
Author: Jason Bau <jbau@stanford.edu>
Date: Wed Apr 2 17:28:11 2014 -0700

middleware to allow sneakpeek courses to deeplink

commit 1de7ab07a5167733140292ab6695362ecf59a
Author: Jason Bau <jbau@stanford.edu>
Date: Mon Jun 23 22:34:41 2014 -0700

middleware for LMS logging out all sneakpeek users

commit 05f7fa4750ef424f646461e966dec6d9cedc79
Author: Jason Bau <jbau@stanford.edu>
Date: Mon Jun 23 23:37:56 2014 -0700

Make sneakpeek OpaqueKeys compliant

Conflicts:

common/djangoapps/student/views.py
lms/djangoapps/courseware/views.py

commit 3d08be33a40a4a948e56d3a21bf2c85b1e12b55e
Author: stv <stv@stanford.edu>
Date: Tue Jun 24 18:19:09 2014 -0700

Disable sneakpeek middleware during tests

commit c38f84fb2f0ba91caa25c8ef9523c27f76f03fa3
Author: Jason Bau <jbau@stanford.edu>
Date: Mon Jul 7 21:04:11 2014 -0400

Fix broken import in deeplink_middleware app

9 git commits (starting 1/12/13) + parts of others

SCREENSHOT

Stanford University

Databases: DB5 SQL

Register Log in

Non-registered mode. [Register](#) to save your course progress.

Courseware Course Info Readings Software Guide

Help

Getting Started

SQL

Introduction to SQL

Basic SELECT Statement

Table Variables and Set Operators

Subqueries in WHERE Clause

Subqueries in FROM and SELECT

The JOIN Family of Operators

Aggregation

NULL Values

Data Modification Statements

SQL Movie-Rating Query Exercises

Exercise

VIDEO

SQL: Intro

Data Definition Language (DDL)
Create table ...
drop table ...

Data Manipulation Language (DML)

Other Commands
indexes, constraints, views, triggers, transactions, authorization, ...

This video provides an introduction to the SQL query language.

SQL, like the relational model, has been around for decades and supports a many billion dollar market.

The first thing you might be wondering is how you pronounce it.

COMPATIBILITY

non-registered User (not AnonymousUser)
it's still a User, so it works everywhere User does

```
class UserProfile(models.Model):
    # New field to keep track of direct access users
    nonregistered = models.BooleanField(default=False)

    # Use in place of user.is_authenticated()
    @classmethod
    def has_registered(cls, user):
        return (hasattr(user, 'profile') and
                not user.profile.nonregistered)

    @classmethod
    def create_nonregistered_user(cls):
        anon_username = cls.get_anon_username() # anon__30_random_chars
        anon_email = "{}+{}@{}".format(anon_username, "example.com")
        anon_user = User(username=anon_username, email=anon_email)
        anon_user.save()
        profile = UserProfile(user=anon_user, nonregistered=True).save()
        return anon_user
```

POLICY — COURSES

courses choose whether to offer direct access via db setting — direct course id match to URL

Django administration

Home > Courseware > Course preferences

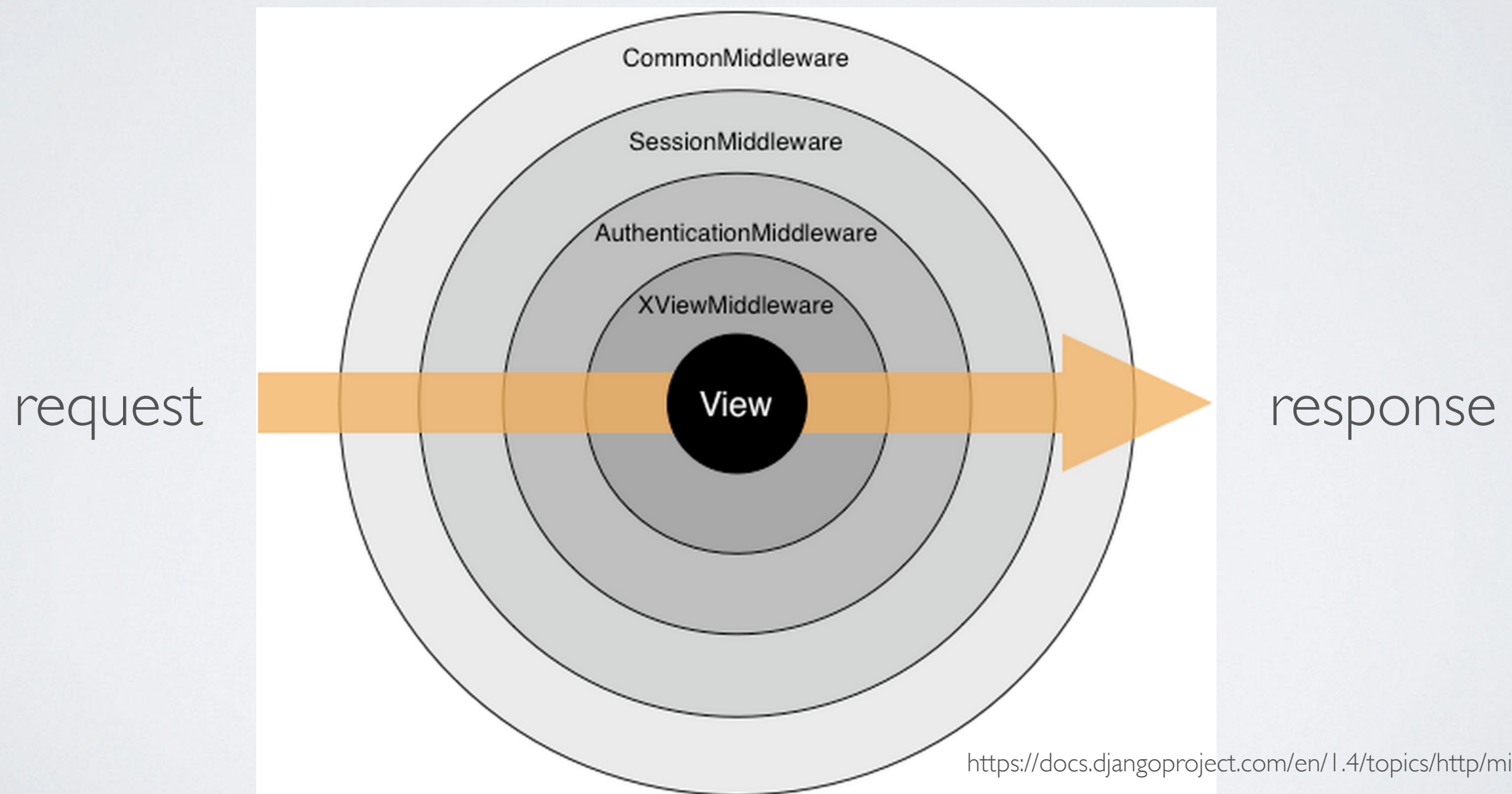
Select course preference to change

Action: 0 of 21 selected

<input type="checkbox"/>	Course preference
<input type="checkbox"/>	Education/OpenKnowledge/Fall2014 : allow_nonregistered_access : true
<input type="checkbox"/>	SampleUniversity/102/Fall2013 : allow_nonregistered_access : true
<input type="checkbox"/>	DB/Recursion/SelfPaced : allow_nonregistered_access : true
<input type="checkbox"/>	DB/OLAP/SelfPaced : allow_nonregistered_access : true
<input type="checkbox"/>	DB/Views/SelfPaced : allow_nonregistered_access : true
<input type="checkbox"/>	DB/Constraints/SelfPaced : allow_nonregistered_access : true
<input type="checkbox"/>	DB/Indexes/SelfPaced : allow_nonregistered_access : true
<input type="checkbox"/>	DB/UML/SelfPaced : allow_nonregistered_access : true

ON-DEMAND USER CREATION

django middleware runs for every HTTP request



ON-DEMAND USER CREATION

on requests to URLs “within” a direct access course,
creates user, logs in (for 1 week), enrolls in course

```
class DirectAccessDeepLinkMiddleware(object):
    def process_request(self, request):
        """
        Minimize user creation.  Make one only if:
        1. request is a GET
        2. request is NOT to a mechanical/api endpoint URL
        3. request.user is AnonymousUser
        4. request URL has a course context
        5. request's course allows direct access
        6. request's course's enrollment period is open
        Does the following:
        1. Registers an anonymous user
        2. Login this user in
        3. Enrolls this user in the course
        """
```

we missed a case ... more to come

SIDE-BY-SIDE SCREENSHOTS

Stanford University

StanfordOnline: Feature Demo Course 🏠 jasonbau

Courseware Course Info Wiki Discussion Progress Navigating Your Course Syllabus EdX Course Documentation Piazza

Hangout Search Chat

▶ Introduction

▶ Videos

▶ Displaying Images

▶ Discussions

▶ Basic Questions

▶ Advanced Questions (Built-in)

▶ Math Problems

▶ Inline Problems

▶ Graded free text-based response

▶ A/B Testing in Studio

▶ A/B Testing with XML

▶ Conditionals

▶ Polls

▶ Word Cloud

ORA / Peer Assessment

Writing Assessment 1
Homework

Writing Assessment 2

Peer Assessment Only

PEER ASSESSMENT ONLY, NO SELF ASSESSMENT

This assignment has several steps. In the first step, you'll provide a response that will appear below the Your Response field.

Censorship in the Libraries

'All of us can think of a book that we hope none of our children own on their shelf. But if I have the right to remove that book from the shelf -- exactly the same right and so does everyone else. And then we have the right to remove that book from the shelf of us.' --Katherine Paterson, Author

Write a persuasive essay to a newspaper reflecting your views on whether or not certain materials, such as books, music, movies, magazines, should be removed from shelves if they are found offensive? Support your position with concrete evidence, experience, observations, and/or reading.

Read for conciseness, clarity of thought, and form.

1 | [Your Response](#)

Enter your response to the question. You can save your progress at any time. **After you submit your response, you cannot edit it.**

Stanford University

StanfordOnline: Feature Demo Course Register Log in

Non-registered mode. [Register](#) to save your course progress.

Courseware Course Info Syllabus EdX Course Documentation Piazza Hangout Search Chat

▶ Introduction

▶ Videos

▶ Displaying Images

▶ Discussions

▶ Basic Questions

▶ Advanced Questions (Built-in)

▶ Math Problems

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▶ Graded free text-based response

▶ A/B Testing in Studio

▶ A/B Testing with XML

▶ Conditionals

▶ Polls

▶ Word Cloud

ORA / Peer Assessment

Writing Assessment 1
Homework

Writing Assessment 2

Peer Assessment Only

POLICY — CONTENT

hardcode what content can be shown

In: `lms/djangoapps/courseware/access.py`:

```
_has_access_descriptor() -> can_load()
```

```
SNEAKPEEK_CATEGORY = [  
# NOT "discussion",  
# NOT "peergrading",  
# NOT "openassessment",  
# NOT "annotatable",  
# NOT "crowdsource_hinter",  
# NOT "discuss",  
# NOT "error",  
    "about",  
    "chapter",  
    "course",  
    "course_info",  
    "problem",  
    "sequential",  
    "html",
```


POLICY — TABS

hardcode what tabs can be shown

```
In: common/lib/xmodule/xmodule/tabs.py:
```

```
CourseTabList.iterate_displayable()
```

```
SNEAKPEEK_TAB_TYPES = [  
    CoursewareTab,  
    CourseInfoTab,  
    StaticTab,  
    SyllabusTab  
]
```

ODDS AND ENDS

- Studio middleware logs out all direct access users
- Don't display logged-in nav for direct access user
- Most logic is conditional on

```
UserProfile.has_registered(request.user)
```

Compare to django standard:

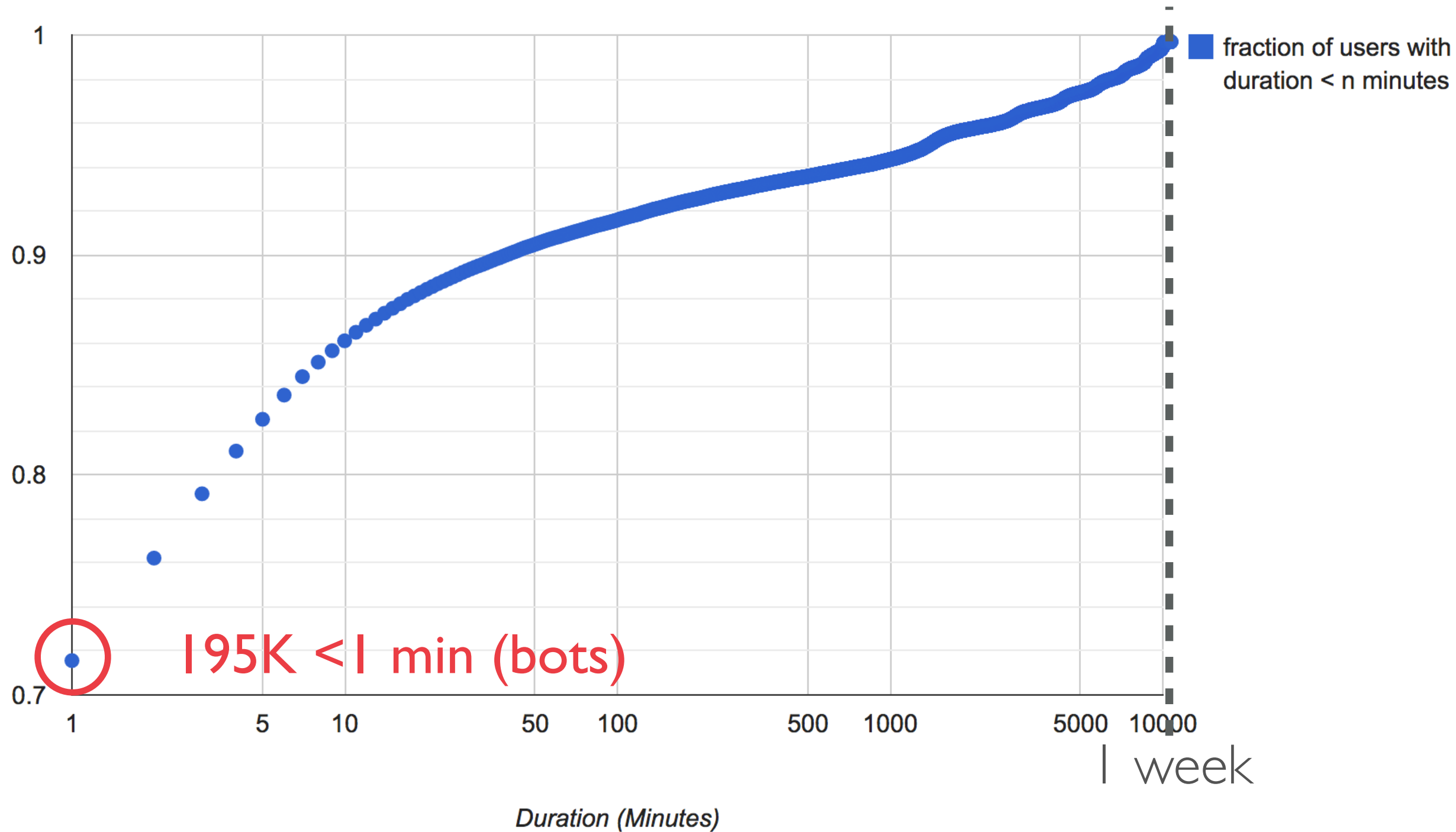
```
request.user.is_authenticated()
```


DATA

- 3 major courses: networking, db, open knowledge
- Rows in `auth_user`:
 - 414753 registered
 - 281777 non-registered (seems like a lot)
- So many non-registered users...
 - visiting course about page creates non-registered users
 - crawler bots can visit course about page (oops), but not crawl
 - course about pages are landing pages from search engines

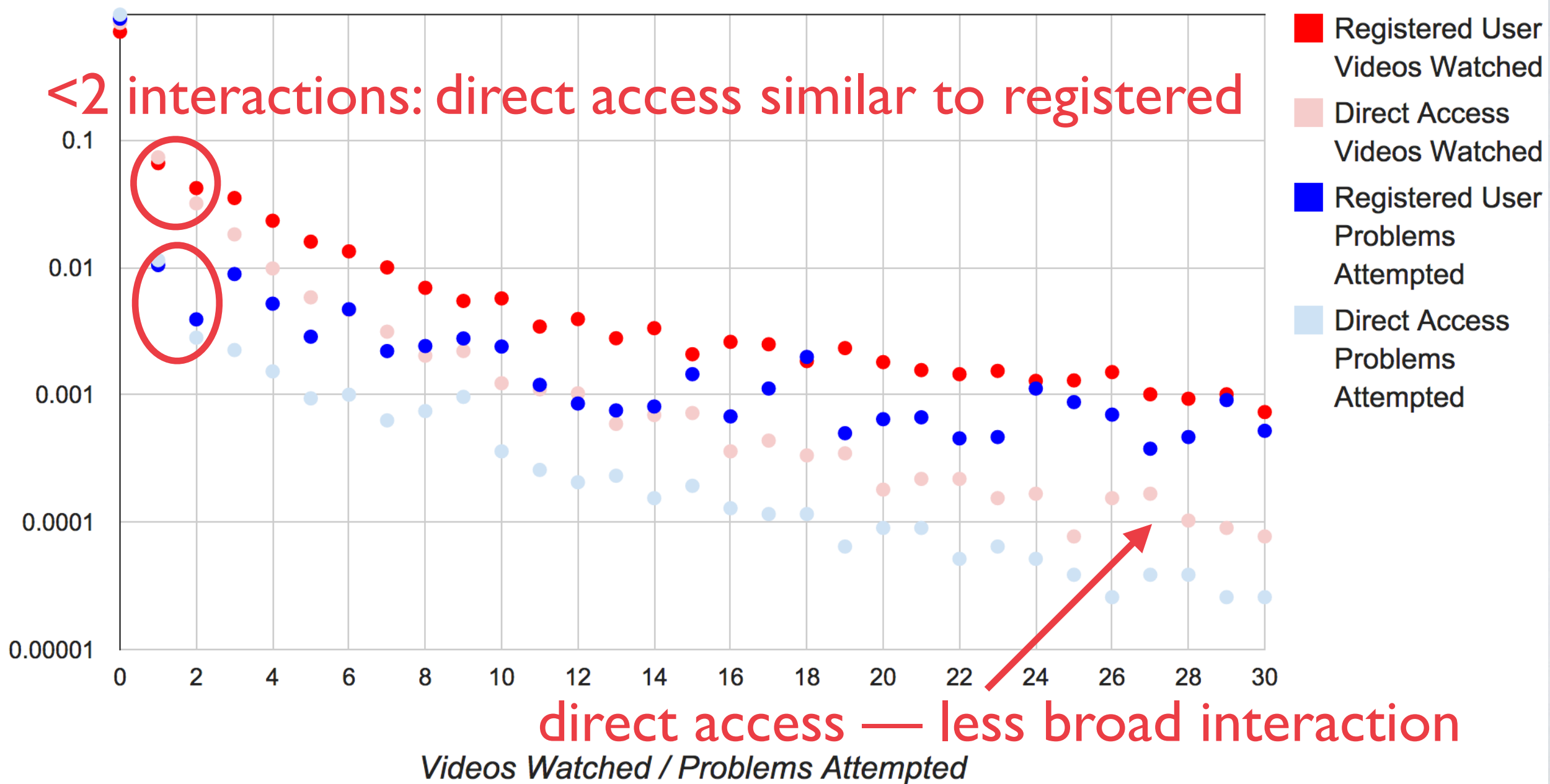
LAST LOG LINE - FIRST LOG LINE

Direct Access Duration (272K)



USER ACTIVITY

Student activity (direct access n=77575) (regular n=89850)



WHAT TO IMPROVE

filter / categorize data better

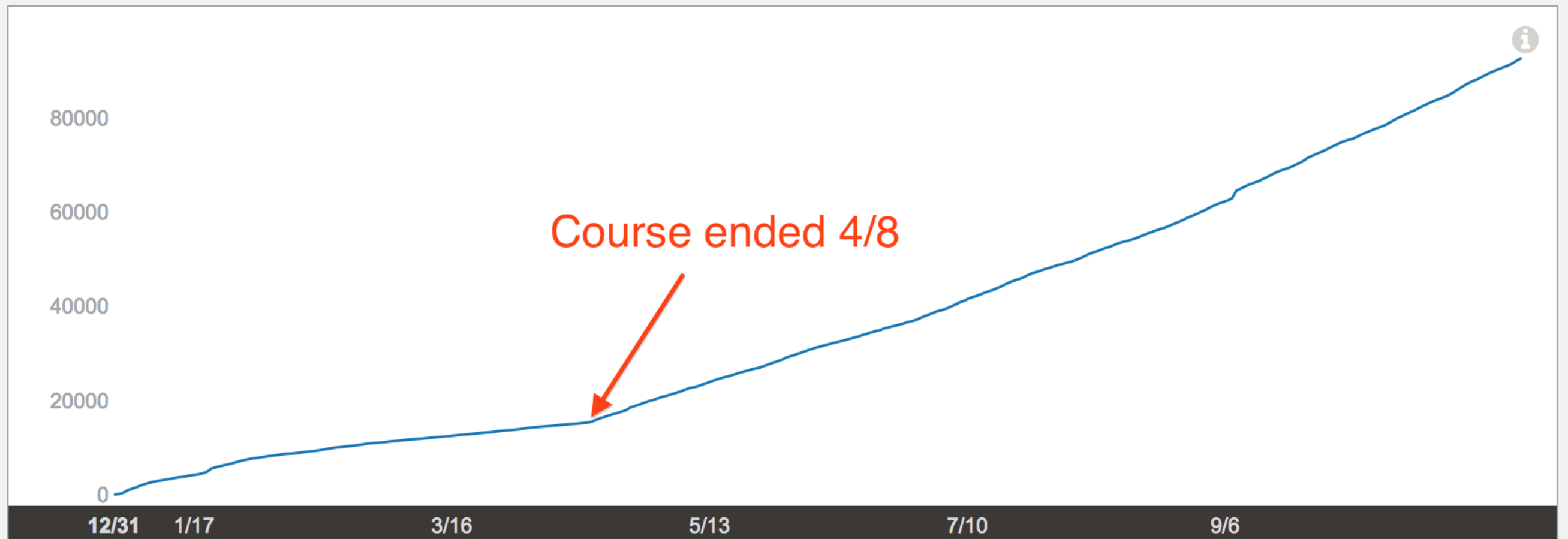
ENROLLMENT ▾

Activity

Geography

Daily Student Enrollment

How many students are in my course?



WHAT TO IMPROVE


studio controls course content direct access

- default policy by content type configured at course level
- inherited overridable settings down content tree


Never published

Editing: Multiple Choice

EDITOR SETTINGS

Display Name 

This name appears in the horizontal navigation at the top of the page.

Allow Direct Access 

Show this unit to visitors who have not registered with the platform

WHAT TO IMPROVE

`FieldData` to keep direct access data out of DB
in session or memcache
But keep tracking log data!

Do last 3 slides and get it merged!

Thanks!

jbau@stanford.edu

github: jbau