



Student study group, Beijing



coursera

Coursera App Platform Technical Preview

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Coursera Engineering**

Introductions

Nick Dellamaggiore - Infrastructure Lead

- Expertise in APIs and Infrastructure
- Previously with LinkedIn
- BS CS + Math from MIT
- @nickdella on Twitter



Brennan Saeta - Software Engineer

- Cloud/AWS Wiz
- MS Computer Science from Stanford



A speech bubble with a black outline and rounded corners. It has a small tail pointing towards the bottom left. The text inside is in a bold, black, sans-serif font.

So, Coursera's building an
App Platform?



Is it going to be like
Facebook?



Is it going to have
an App Store?

What about
the cloud?

I can't code. How does this benefit me?

How is this different from LTI?

What about QTI, LIS, SCORM, LON-CAPA?

Can students run their own apps in a

What if my app can't handle the load?

Do I have to code on a server?

Can it be open source?

Real questions you may have

We're just getting started on this.

We have some ideas to share today

But, we really need **your** input!

app-platform@coursera.org

State of the Platform



- Home
- Video Lectures
- Assignments
- Quizzes
- Discussion Forums
- Course Information - 77
- Course Information - 147
- Course Information - online
- Syllabus and Calendar - 77
- Syllabus and Calendar - 147

✓ You've started Assignment 5!



Chinmay Kulikarni **Not Started**
Chained

Invite your friends!

Like 10k
Tweet 4,900
+1 6.1k

Upcoming Deadlines

Announcements

★ Introducing new social features [experimental]

We hope you've been enjoying learning about human-computer interaction! Today, we're thrilled to introduce new, experimental features to the class. If you opt in, these features will let you see what your friends have been doing in their assignments, and to share your progress with them. Whether or not you choose to opt in will not affect your course grades or other course benefits.

If you sign up, you'll receive an email from us with more information as we roll it out. To be one of the first to try out these features, sign up now!!

I've started Assignment 5!

86 people have started!

This assignment is due on Sunday, Nov 18 at 10pm PST.

	Abby	Bess	Cody	Dana
Abby	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bess	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cody	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Dana	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Answer

Acceptable formats

WYSIWYG

Plain Text

$x^2 + 2x - 1$

$((x^2 + (2 \cdot x)) - 1)$

Check Answer

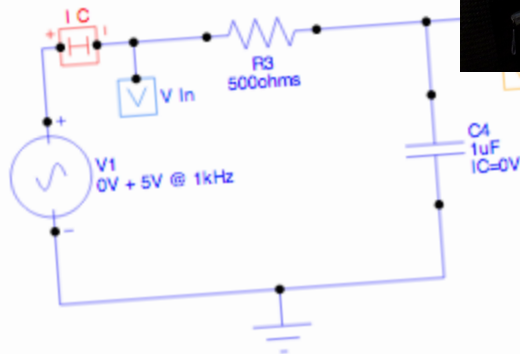
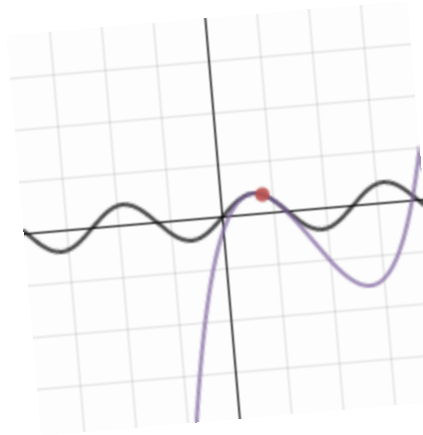
Do you need help?

I'd like another hint (3 steps left)

Progress



Partners are already innovating on Coursera



Developers want to integrate tools and services

Coursera Platform Today

State of integrations today

- Liberal use of JavaScript injection
- One-off app integrations
- Basic LTI support

Extending Coursera needs improvement

Many integrations are simply not possible without custom engineering support from Coursera.

Coursera App Platform Principles

- Allow partners to innovate and experiment
 - Without being a developer
- Promote sharing and reuse
- Open, documented & friendly

experimentation

reusable course
plugins

productivity and
collaboration tools

open data

Coursera: a platform **without limits**

ubiquitous

MOOC-scale
infrastructure

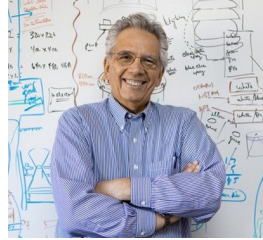
open
services

learning
tools

extensible
user interfaces

Everyone benefits

Instructors, Course Admins



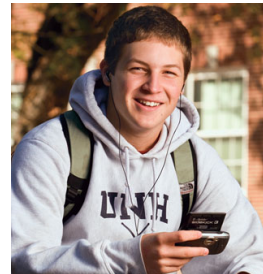
- Experimentation
- Reusable, modular plugins
- More tool integration

MOOC Trailblazers



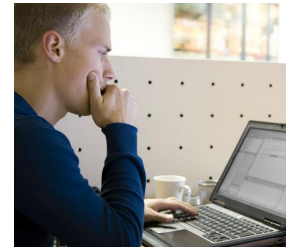
- Experimentation
- A programmable Coursera
- Limitless* platform

Students



- Learning tools
- Productivity/collaboration apps
 - Course-recommended
 - Self-installed

Developers




- Easily plug in existing apps
- Build deep platform integrations
- Get massive distribution




Our partners are already innovating on the Coursera Platform today with our limited toolset.

We see vast room for improvement

Home
 Video Lectures
 Assignments
 Quizzes
 Discussion For
 Course Informa
 Course Informa
 Course Informa
 Syllabus and C
 Syllabus and C


Chinmay Kulkarni Not Started

Invite your friends!


Your progress  What's this?

- ☒ Look at the assignment
- ☒ Redesign a component of your prototype
- ☒ Test your original prototype and redesigned component with one person
- ☐ Update, then test your prototype and redesigned component with
- ☐ Update, then test your prototype and redesigned component with
- ☐ Analyze and reflect on your findings


I've started Assignment 5!

86 people have started!

This assignment is due on Sunday, Nov 18 at 10pm PST.



Chinmay Kulkarni Not Started

Cheer on Chinmay! 

Top of an assignment

I meant to be a huge redesign of your prototype. We want you to select something often go through many many different versions of prototypes before their final design, so we want you to get familiar with the process (given our time constraints for the course). Spend a couple hours at most on this. The change that you make should be small, but still not trivial. For instance, changing the position of your site logo from top left of the page to the top right is a trivial change. Ideally, the change should let you understand user needs better when compared against original prototype (See step 2).

Social Learning experiments (Stanford HCI)

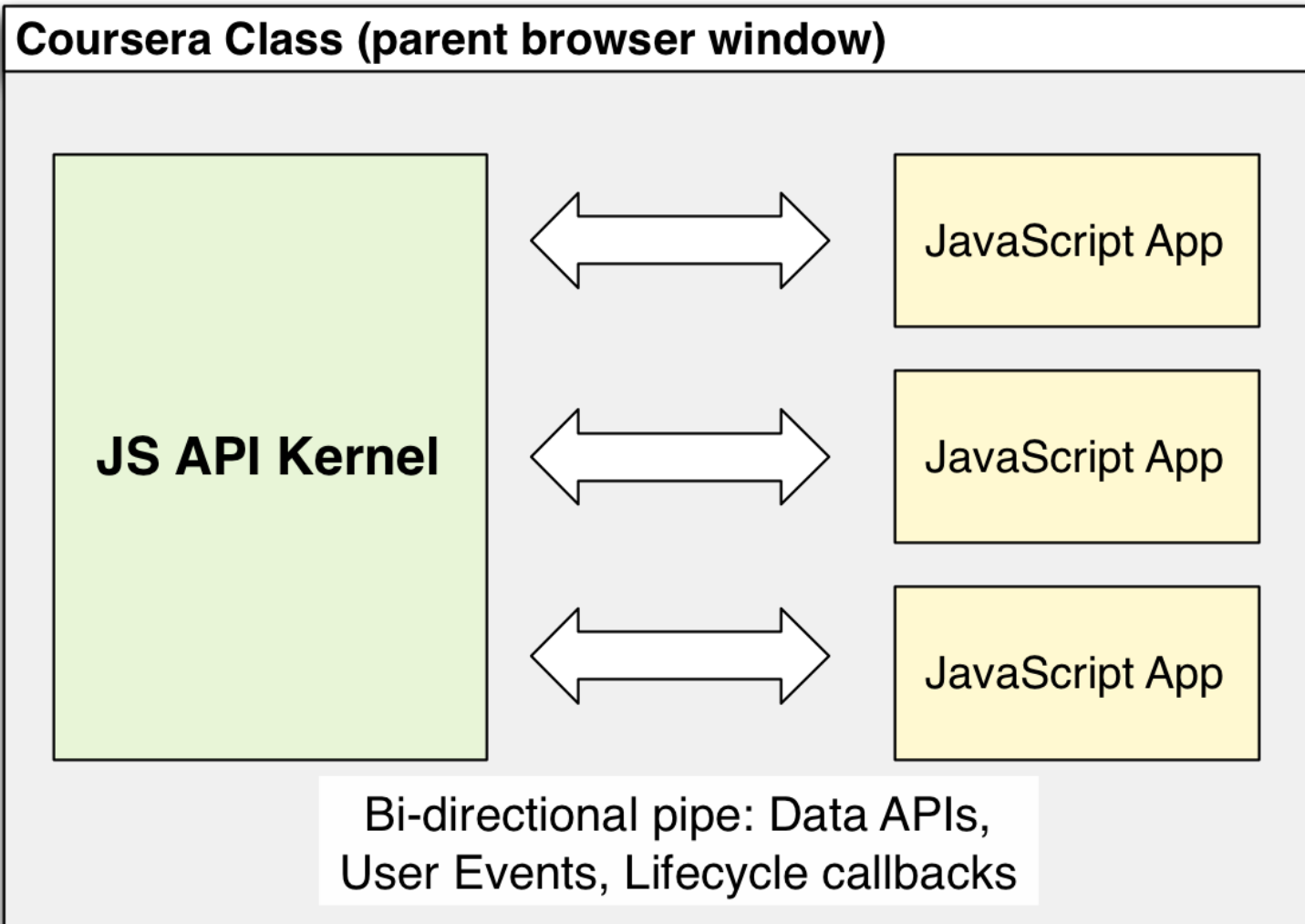
Whoa! How'd they do that?

JavaScript injection

- "Supported" by Coursera Platform today
- Brittle: Coupled to Coursera's page layout
- Insecure: too much access
- Limited: no APIs to interact beyond the current page

Let's make this better!

JS API Overview



JS Apps are reusable

- Customize and extend Coursera
 - Change user experience
 - New content modules/widgets
 - Deeply embed apps
- Reusable
 - Allow apps to be packaged, distributed
 - Enable discovery, installation, configuration

3rd party tools extend the
platform's core capabilities

and APIs bring Coursera data into
3rd party tools and services

Coursera Data APIs

Student

- account/profile
- enrolled courses
- send message

Course Catalog

- Search/browse
- Course info
- Instructor profiles

Auth

- OpenID (identity)
- OAuth (access)

Class

- syllabus/schedule
- forum viewing/posting
- assignment grade submissions
- peer grading submission
- lecture/subtitle info
- student progress, activity
- user roles/permissions
- quiz question import/export
- ... and more

3rd Party Apps

- Apps can be
 - installed by students directly
 - installed by instructors for an entire course
 - embedded in any context: lecture, quiz, forums, etc
- Enhanced LTI support*
- Some apps may build deeper integrations via the JavaScript API

MOOCs can generate substantial traffic to apps and learning tools. How can we help developers build at "MOOC-scale"?

Grading environment

Synchronous Grading

- Enable custom question types
- Coursera runs your grader on MOOC-scale infrastructure

```
image = new SimpleImage("stop.jpg");
back = new SimpleImage("leaves.jpg");

for (pixel: image) {
    avg = (pixel.getRed() + pixel.getGreen() + pixel.getBlue())/3;
    if (pixel.getRed() > avg * 1.5) {
        x = pixel.getX();
        y = pixel.getY();
        pixel2 = back.getPixel(x, y);
        pixel.setRed(pixel2.getRed());
        pixel.setGreen(pixel2.getGreen());
        pixel.setBlue(pixel2.getBlue());
    }
}
print(image);
```

Run



Asynchronous Grading

- Current: custom integration with Coursera
- Future: Self-service
 - Scale on MOOC-hardened infrastructure
 - Well documented & easy to use



More MOOC-scale infrastructure

- Static asset serving
 - Serverless Javascript Apps
- Key-value storage service for simple data persistence
 - Secure: Coursera keeps student data in one place
 - Simple: just one Coursera JS API call away
- Other tools?



Apps Platform: Recap

Coursera: A Platform without Limits

- Open APIs
 - Modern OAuth2 & REST
 - LTI
- Enable customization and experimentation
 - Rich extensions
 - A/B Testing
- MOOC-scale infrastructure
 - You build it, we run it.

Interested in working with us? Take the [survey](#), read the [FAQ](#) or just email us at app-platform@coursera.org