An eLearning platform for distanced collaborative programming

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CONTENT

INTRODUCTION

The Missing Pieces of Learning Programming, collaboration

Education is old, so does the way we learning programming. Traditionally, we learn programming though teachers' notes and guidelines, supplemented with tutorials, individual assignments and labs. This traditional way of learning programming is fine, designed to teach students the fundamental concert of programming and logic. However, when it comes to real world programming practice, something is missing.

Living in a cyber society connected with internet, we work productively by collaborating with each other. In order to learn and gain more experience on collaborative programming, a new form of programming education is needed. We seek cues from Facebook and Codecademy, learning how they developed a successful modal. Now we introduce our platform for online collaborative programming learning to disrupt traditional programming education.


Our Learning platform for collaborative programming values "collaboration" the most. We introduced numerous core features like collaborative drawing board, team matching system, voice and message chat, peer comment and concurrent document editing.

Traditional Lecture lacks collaboration task

Past Case Studies

Codecademy is by now the most similar product in the market. It is an online learning platform for programming where students can login and learn programming with step by step guide. Our Learning platform however, focus on enhancing student's collaboration skills on programming, rather than each student finish their programming assignment on their own like Codecademy.
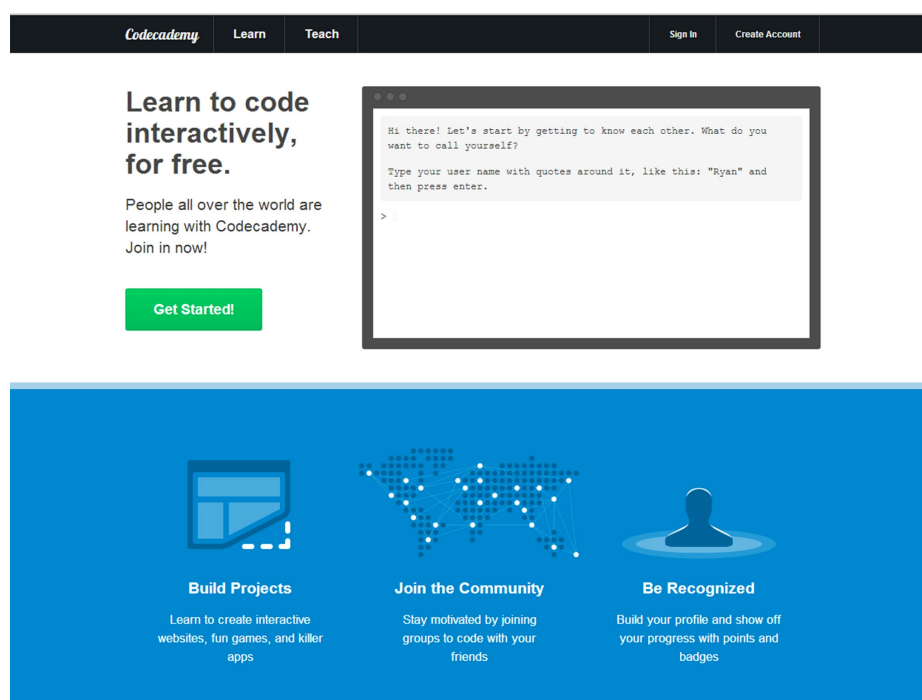
Similar product, but not designed for schools and universities

Beside, our platform is especially designed for university and secondary school, where students should challenge themselves to finish the collaborative assignment that posted by their teachers.

OBJECTIVE

i.Provide an online platform for distance collaborative programming

ii.Enhance students' collaboration skills and promote positive peer interaction via platform

iii.Facilitate teachers to evaluate students' progress

The ultimate goal of the project is to provide an interactive and user-friendly eLearning platform with multifarious resources for distanced collaborative programming. With the help of the platform, collaboration and communication among students are promoted through the sharing of knowledge and experience. Meanwhile, teacher can easily assess students' performance using the platform. It is hoped that the platform can help students to learning collaborative programming effectively.

PROJECT FLOW

Basically there will be four main phases when using this platform.

DESIGNING ASSIGNMENT

Before students can make use of this platform,teacher has to design the assignment first by giving description of the task, requirement ,specification and size of team.Also,teacher needs to submit a sample code and test case.The platform will then execute the sample code to obtain the answers.

GROUP MATCHING

After the teacher has submitted the assignment,the computer will automatically match students who have taken the course.Each team may contains student from HKU,student from Macau or even student from university overseas.

When the team is formed,members will be noticed by Email and moved on to next phase.

DISCUSSION PERIOD

First of all,students need to fill in their preferred time for discussion in 24 hours scope.The platform will try to suggest a suitable time for discussion for all teammates.

The platform will provide voice chat function for discussion.In case they cannot find a suitable time to meet,chat room function is also provided for leaving messages.We think that effective way of communication is the key to collaborate.

Students will stay in this phase unless all members in team agree to proceed,or the timer is exceeded. During this phase,students can only work on the collaboration board.
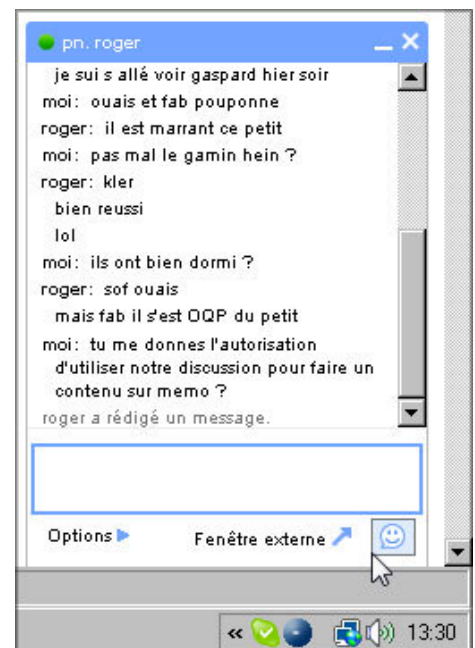
CODING

Students can start coding in this phase,supplemented with voice chat and text chat.They will be coding in a style like Google Docs on the platform simultaneously.

Their work in the collaboration board in previous phase will be passed into this phase.And they can keep making use of board and editing the contents.

Time based versioning control will be implemented for them to recover their work.
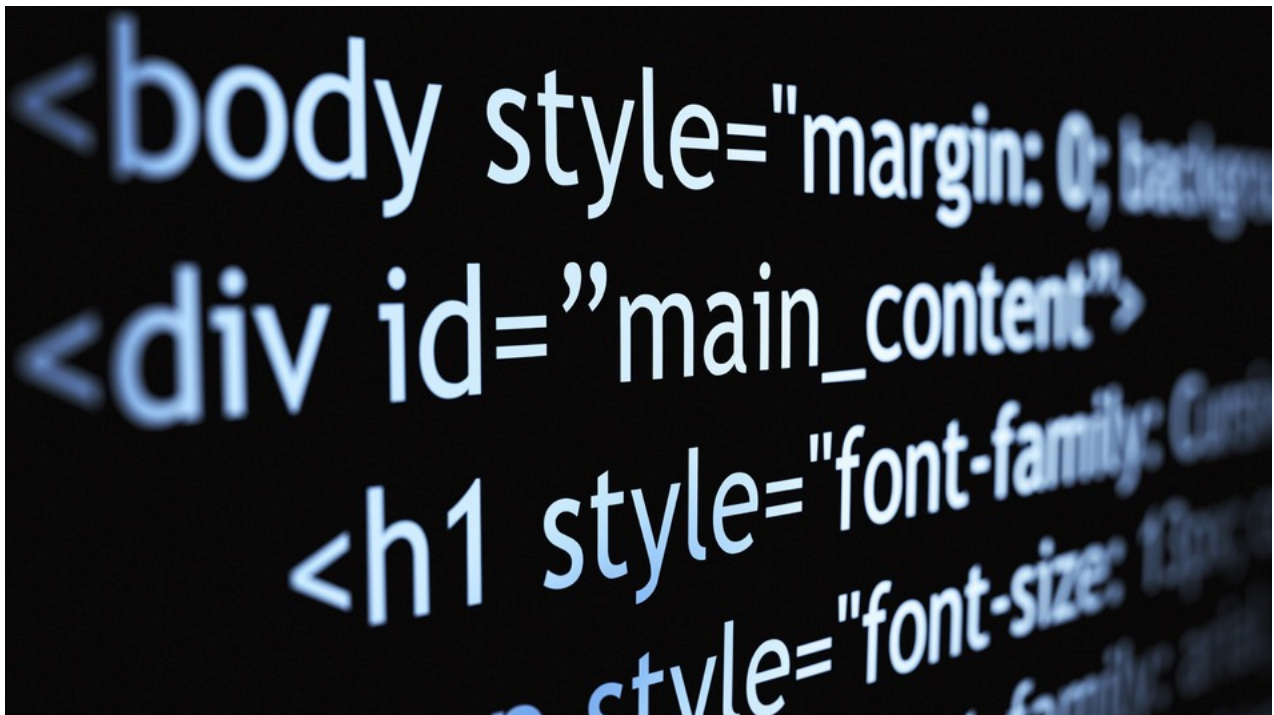
SUBMITTING TO GRADE

Each assignment has a deadline set by teacher.The system will grade students' work by compiling their source code and comparing to the test cases after the deadline is passed. After the deadline, statistic of performance for each team will be visible to teacher.

PROJECTING SETTING

PROJECT DESCRIPTION
The eLearning platform is combination of online integrated development environment and cloud code editor. It allows users work together on single programming project at the same time. Also, users can compile source code and execute it online. To achieve the objective of being an online learning tool, several essential features are introduced.

REAL-TIME CODE EDITING
Concurrent code editing is the core function of the platform. Multiple users can edit the same code concurrently. Changes will be saved in the server and show the all users instantly.

The "last edited by" for each class will be displayed on the screen. And time based versioning control will be implemented for them to recover their work.
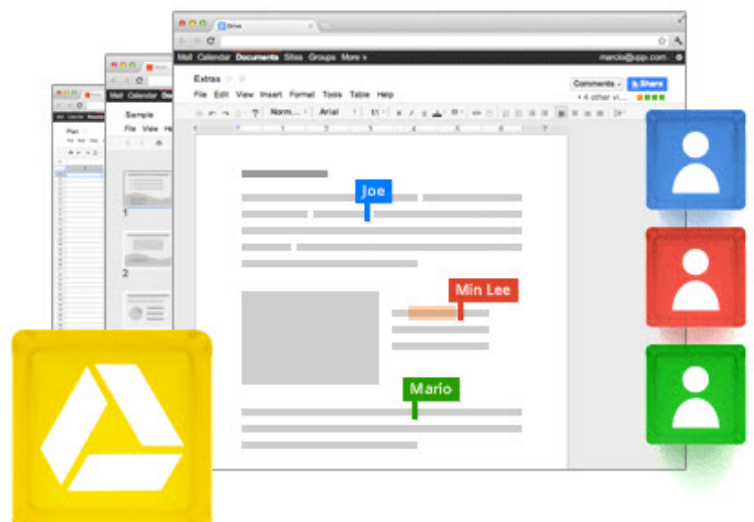
COLLABORATION BOARD
Collaboration board is workplace for users to brainstorm ideas, shape the program and unify coding style. With the help of drawing tools, students can visualise their ideas by drawing flowcharts or diagrams on the real-time whiteboard. Besides, it facilitates students to manage the project by allowing them to discuss issues like program design and work division.
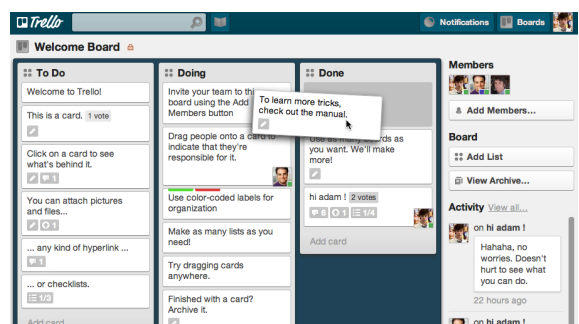
AUDIO AND TEXT CHAT

To enhance communication between users, the platform will support both audio and text chat. Users can chat with each other with familiar instant messaging or by starting an online group conversation.

PEER COMMENT

Students are encouraged to leave comments on other students code and tag the comment. Providing peer feedback let student develop monitoring mechanisms for their own learning activities.
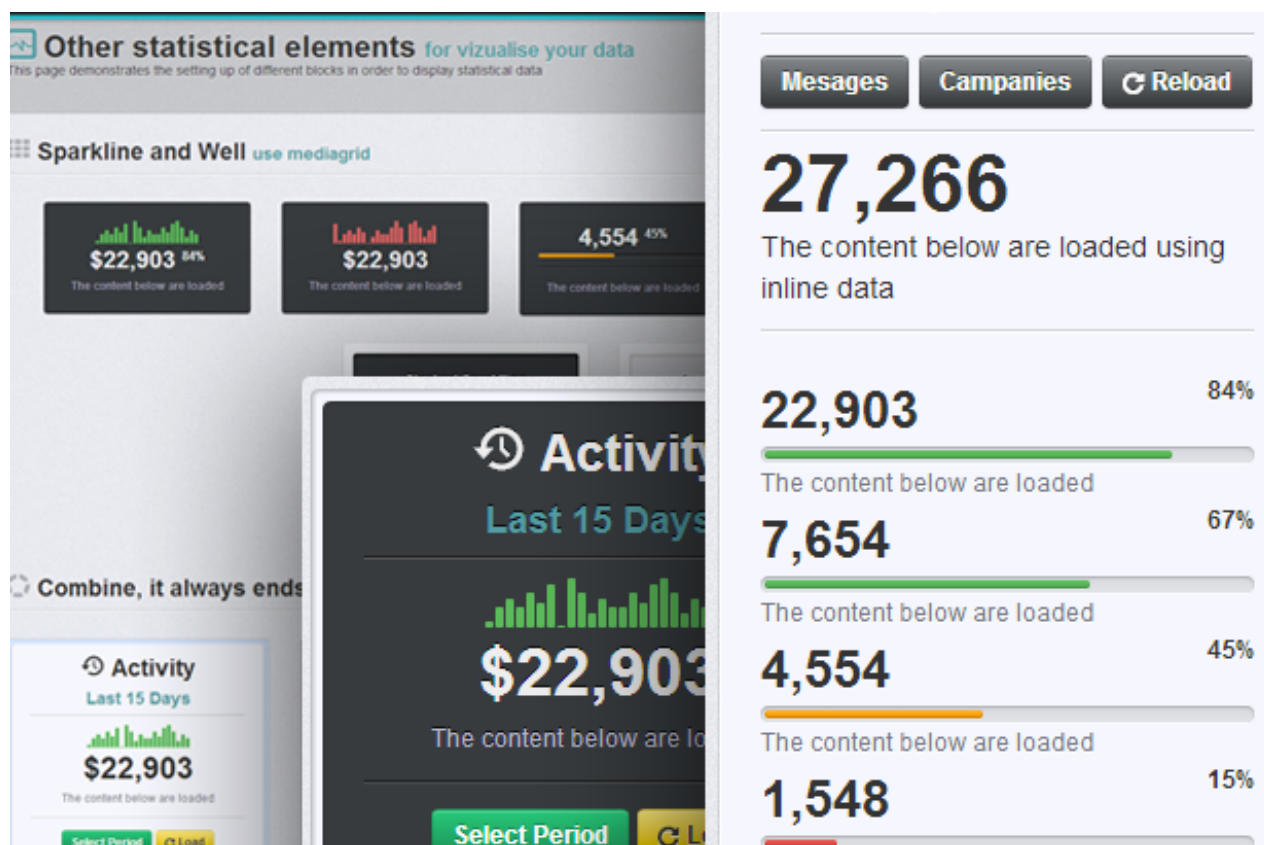

STATISTIC

Some useful data will be collected,including the duration of voice chat,number of messages and types of comments,to see the degree of collaboration.

TECHNICAL DIFFICULTIES

To implement real time collaboration, some technical difficulties are expected to encounter, for example data concurrency issue to maintain a most updated version of the programming file to achieve real time coding.

Video and voice chat is also a problem. We have to think how to due with multiple data streaming and data handling.

For the collaboration board, we should first research on the best way to for students to interact. User experience is also one of the key area to be focused here. One possible solution is to reference more successful modal in the market.

SCHEDULE

Sep 2014	Project Plan and Project Web Page
Oct 2014 - Jan 2015	Preliminary Implementation
Jan 2015	Interim Report Preparation
Feb 2015	First Presentation
Feb 2015 - Mar 2015	Finalized Implementation
Apr 2015	Final Report Preparation
Apr 2015 - May 2015	Project Exhibition Preparation
May 2015	Project Exhibition

GANTT project

Name	Begin date	End date
▼ ○ Database Design	9/29/14	10/12/14
○ Database Schema	9/29/14	10/12/14
▼ ○ Server Infrastructure	9/29/14	10/14/14
○ Linux Disto Deployment	9/29/14	10/5/14
○ Software Installation	10/6/14	10/10/14
○ Files and Folders Format Style	10/13/14	10/14/14
▼ ○ User Interface Design	11/1/14	11/28/14
○ User Experience Reseach	11/1/14	11/14/14
○ User Layout Mockup	11/15/14	11/28/14
▼ ○ Implementation	12/1/14	12/12/14
○ Database API	12/1/14	12/12/14
○ File System API	12/1/14	12/12/14
○ RESTful API	12/1/14	12/12/14
▼ ○ Deliverables of Phase 1	9/15/14	9/28/14
○ Detailed project plan	9/15/14	9/28/14
○ Project web page	9/23/14	9/28/14
▼ First presentation	2/2/15	2/16/15
○ Platform Demo	2/2/15	2/11/15
○ Precentation Slides	2/2/15	2/11/15
○ Presentation	2/12/15	2/16/15
▼ ○ Deliverables of Phase 2	2/17/15	2/25/15
○ Preliminiary implementation	2/17/15	2/25/15
○ Detailed interim report	2/25/15	2/25/15
▼ ○ Deliverables of Phase 3	4/19/15	4/19/15
○ Finalized tested implementation	4/19/15	4/19/15
○ Final report	4/19/15	4/19/15
▼ Final Precentation	4/20/15	5/4/15
○ Final presentation	4/20/15	4/24/15
○ Project exhibition	5/4/15	5/4/15
○ Database Design Completed and Usable	9/21/14	9/21/14