

# Code Spaces

## Introduction

Coding is a skill that is highly important in this day of age. A couple of years ago, college was the first place students get familiar with coding. However, recently many high school started to have computer science class that teach coding. Unfortunately, the teachers that teach these classes usually lack one of two different skills: technical knowledge and individual feedback.

Firstly, there are many high schools in US and other countries where a teacher is forced or incentivized to teach a subject that is beyond his experience or teaching skills. Computer science is a subject that leads this category along with athletics. People with computer science skills almost never choose to be high school teachers, since job opportunities in this industry is greatly abundant with high payrolls. Therefore, we can observe that many math teachers work part time as a computer science teacher as well.

Secondly, teachers with computer science background tend to have poor individual feedback skills. They make harsh comments that seem reasonable, but unfortunately discourages students. A teacher should be able to give reasonable overall feedback without being overly specific about mistake. He/she should be able to spot common trends and mistakes and empathize with student on why they might think in that certain way. At last he/she should be able to voice these in a clear and encouraging manner.

Code Space aims to be a solution for both of these problems by having coding review as well as individual feedback practice. Computer science teachers can spend an hour using Code Space and get acclimated with both of these skills.

## User and Context

Code Spaces is intended for two different type of high school teachers who teach computer science courses. First user is a teacher who doesn't have much background in computer science and coding. Code Spaces is a practice space for these teachers to practice their code review skills. Second user for Code Spaces is a teacher who has extensive computer science background but lacks giving individual feedback to students. This user would likely finish code reviews effortlessly. However, many people with computer science skills struggle to give feedback in simple and encouraging way. Code Spaces is a practice space for these teachers

to practice their feedback skills and learn from example feedback. The context of Code Space is wide open, since it can be used before school season as well as during. Teachers can open their laptop and go to a simple website url in order to practice their code review and feedback skills.

## Design

Code Space starts by prompting user to enter their level of computer science background and the reason of why they are using this tool. After the initial steps, user is confronted a student profile which includes student name, description, and coding level. User also sees a coding problem briefly explained and the solution the student came up with. The user is supposed to click on the 'Next' button to navigate through the coding lines and select issues from a list of common mistakes presented in the form of a dropdown menu. After completing all the lines the user can see what are the problems we see with the code segment. Then the user can go to the next problem. This process continues until there are no problems left for that specific student. This leads to a prompt for an individual feedback. After entering a feedback user can preview the example feedback we came up with and get a sense of what he could do better. The platform continues the process with another student.

## Learning Objectives

As mentioned in the introduction there are two specific learning objectives of Code Space.

### Code Review Skill:

Code Space aims to help teachers get some practice on code reviewing. In the platform they get to observe some common mistakes beginners, intermediate, and advanced students make. This helps them prepare for real life situations where they need to find mistakes from a student written code.

### Individual Feedback Skill:

Code Space aims to provide practice for a much needed skill of individual feedback. A student that is struggling in the class shouldn't have the same feedback as a student that already have a great knowledge of coding before taking the class. Platform provides different levels of students and multiple problems for each student. This helps teachers to practice personalized feedback. It also provides example feedbacks that help teachers have a sense if they are giving encouraging quality feedback.

## Justifications of Technology Used

The technology used for this practice space is a simple web platform with static web content and javascript. A platform meant to be a code review practice hub should be online and

accessible. For further work this can be turned into a dynamic webpage where students and questions are pulled from a database and the activity of the users are tracked to support learning analytics experiments.

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