

# Dungeon Coder

## Project Backlog

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### Problem Statement:

Learning how to code can be a very difficult and boring task for kids and people who have no coding experience. The initial experience of learning the basics of programming can be very challenging and tedious which results in many giving up at the beginning.

### Background Info and Targeted User:

Programming has become one of the most essential skills that every student must learn, and programming courses are now included at the all school levels. Also, various platforms have been created to aid teaching students, especially at a younger age, on the basics of programming. At the same time, sandbox games are becoming a very popular game genre because it allows users to use their creativity. So, our targeted users are people who are interested in coding but have no coding experience, who likes fantastic sandbox play style, and who wants to express their creativity.

### Similar Applications and Limitation:

There are several existing applications for teaching the basics of programming like Scratch, Swift Playgrounds and Code.org. However, all these applications only ask users to solve puzzles by implementing a correct algorithm on the side. Although it may be interesting at first, people get bored after several stages and will hardly revisit the application once they have beaten all the missions.

Also, these applications lacks variety as the only difference between these applications is the programming language they teach and the style of puzzle. Lastly, most of these applications are single-user based and lack social features.

### Solutions:

Our project has a study plan that connects studying with interesting game features, such as doing homework by beating a certain stage. So unlike users of other applications, our users won't lose interest in 5 minutes. Also, as an action based game, it allows multiple solution to a single problem. We believe it can make learning the basics of programming interesting while at the same time, stimulating their creativity. For other applications, there is a limited set of puzzles that can be solved while we can have unlimited designs and stages made by our users. Therefore, our users will have a reason to open our game again, even after they have beaten the main story. Lastly, our project connects our users to other people hence, you will always have company when studying and playing.

## **Functional Requirements:**

1. As a student, I would like to play as a normal player after I finish working on assignments.
2. As a student or player, I would like to be able to register an account and manage my information.
3. As a student or player, I would like to design my own movements, skills and equipments.
4. As a student or player, I would like to be able to save my progress manually and automatically.
5. As a student or player, I would like to be able to easily browse and repeat a stage.
6. As a student or player, I would like to be able see difficulty, objective and explanation of a stage.
7. As a student or player, I would like to be able to get hints on a stage.
8. As a student or player, I would like to be able to discuss, ask questions and respond to others in a discussion page.
9. As a player, I would like to record my battle and share it to others.
10. As a player, I would like to download and play challenging stages made by other people after I beat the game.
11. As a player, I would like to have an achievements system in the game.
12. As a player, I would like to make and upload my own stages and designs.
13. As a player, I would like to see others' designs sorted by upload time, popularity, and difficulty.
14. As a student, I would like to see how many attempts I took to complete my tasks.
15. As a teacher, I would like to edit the point values of different tasks.
16. As a teacher, I would like to keep track of my students' progress.
17. As a teacher, I would like to see statistics on the class progress as a whole.
18. As a teacher, I would like to assign tags to certain students that require more attention.
19. As a teacher, I would like to be able to create announcements for the class.
20. As a teacher, I would like to be able to control the access of stages of the game.
21. As a teacher, I would like to be able to set a deadline for the students to complete the stage.
22. As a teacher, I would like to be able to review my students' attempted codes.
23. As a teacher, I would like to save some or all of my student's attempted codes.
24. As a teacher, I would like to be able to assign grades and leave comments on the gradebook.
25. As a teacher, I would like to be able to show a good example of codes after the deadline is over.
26. As a teacher, I would like to be able to respond to student questions on the discussion page.
27. If time allows, as a player, I would like to be able to view a competitive leaderboard with other users.
28. If time allows, as a player, I would like to be able to choose other programming language that I'm already familiar with.

## **Non-Functional Requirements:**

1. The application will run on Windows Operating System.
2. The interface needs to be simple and user friendly to prevent confusion for the users.

3. The application must be able to integrate with a backend server to save students' and teachers' data and transfer vital information for the game.
4. The application must provide the freedom for users to manipulate movements, skills and equipments to a certain degree to prevent crashes and imbalance.
5. The stages made by students must be validated to ensure that stages are beatable to prevent infinite stages and unexpected game crashes.
6. The application must be able to be scaled to support multiple programming languages.
7. The source code should be encrypted to prevent users or players from accessing and altering.
8. As user data is sensitive, accounts must be secure so that tampering is very difficult.
9. If time allows, integration with Purdue accounts for easy authentication.