Stakeholders

Despite every effort is made to ensure this game is as interesting as possible, this game is not designed for absolute beginners who want to learn more about what computer science is, the reason of which is that this game assumes basic knowledge in computing such as a tree in graph theory and it does not include introductions to these theories. If a user wants to learn more about the implementation of an algorithm, programming knowledge may be needed. However, it is still possible for a learner to get a taste of advanced algorithms, although this game is not designed to do so. In conclusion, there are two main possible types of stakeholders:

1. Those who have already obtained some basic concepts of algorithms and want to study further in this area, then this game would be a good starting point to get a feeling;
2. Teachers might want to utilise this game in lessons while introducing relevant topics in order to add more fun to lessons. As each level in my game will centre around a key algorithm, e.g. dynamic programming, then this game can be played when DP is going to be the topic of the lesson.

Research

Coding game

Creating interesting game background to help leaners learn coding from scratch

Competitions similar to OJ but multi-player

Different types of games to improve coding skills

Lacks knowledge of some advanced algorithms

Fancy visual effects are used as an illustration of some rather abstract ideas in programming while most of the content is for beginners who have no experience before. They do offer multi-player competitions where one can challenge friends, schoolmates or coworkers, which is fun and interactive, but there is less visualisation in higher level problems. In addition, those coding challenges are less difficult than those on lots of OJ platforms.

<https://www.codingame.com/start>



[CS-Playground-React](http://cs-playground-react.surge.sh/)

a simple in-browser JavaScript sandbox for learning and practicing algorithms and data structures.

offers solutions for when you get stuck, and comes chock-full of [links to helpful articles, tutorials, and other resources](https://github.com/no-stack-dub-sack/cs-playground-react/blob/master/RESOURCES.md)

this website teaches you some data structure and algorithms but not in a game context

<http://cs-playground-react.surge.sh/>



Teaching Kids Computer Programming

These games are meant to be a very brief introduction to programming which is not what I intended to do

<https://educators.brainpop.com/2014/09/26/6-free-games-teaching-computer-programming-kids/>



Online Judging system

<https://uva.onlinejudge.org/>

<https://leetcode.com/>

<http://codeforces.com/>

These are all very well-known online judge systems where programmers can practice solving algorithmic problems and submit their solutions to judging systems. Feedback can normally be given in a few seconds. Some competitions may also be held regularly on these platforms. They are all perfect places to improve coding skills, but those problems are all designed by experts and tend to be very challenging. And it is often the case that there is no visualisation available on these websites, which makes solving these problems even more harder.

UK Bebras challenge

This challenge is held annually and introduces computational thinking to students in different age groups. The main part of this challenge is to solve puzzles that require logic thinking rather than prior knowledge in computer science. Web-based human interaction is also available so that the participant can interact with the computer to obtain the solution.



<http://www.bebras.uk/students.html>

Ticket to Ride – a board game

*Ticket to Ride* is a cross-country train adventure where players collect cards of various types of train cars that enable them to claim railway routes connecting cities in various countries around the world.

the students through the missions that they choose about connecting one city to another, come across the implementation of the above algorithms. (Kruskal’s, Prim’s and Dijkstra’s algorithm)



<https://www.daysofwonder.com/tickettoride/en/>

An Educational Game for Teaching Search Algorithms

This is an article about using a Pacman game designed by the university team to teach searching algorithms such as DFS, A\*, etc. This game consists of detailed explanations and visualisations of these algorithms in the game context. Students who play this game will also have the chance to apply their knowledge in the game.



Visualizations can demonstrate the operational functionality of algorithms and are designed in line with the principles of student’s active learning

http://kbhgames.com/tag/algorithm