

### High Concept:

This game will help students learn and revise the topics covered in GCSE Computer Science.

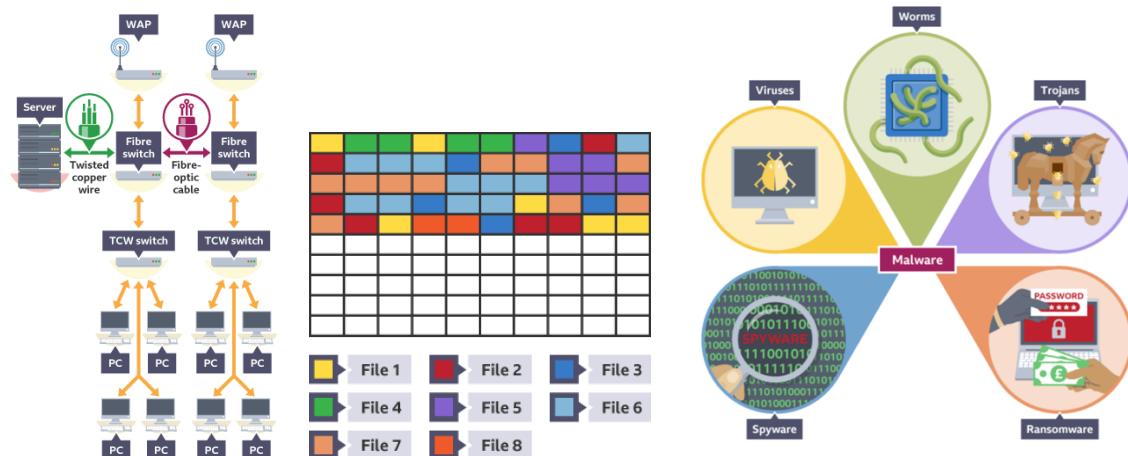


Figure 1 Images from BBC Bitesize GCSE Computer Science showing example topics, networking, defragmentation and malware

### Summary:

Through engaging gameplay specifically aimed at teenagers, players will take on the role of The Control Unit within the CPU. The first task will be to master Von Neumann Architecture.

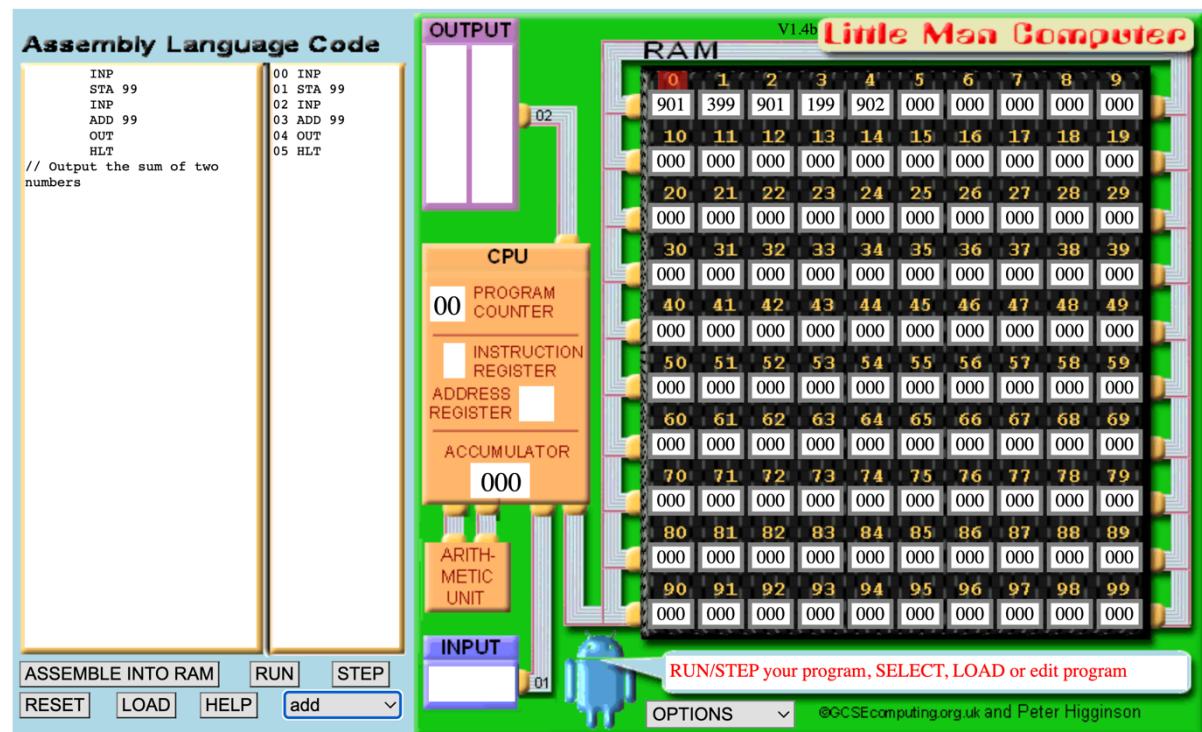


Figure 2 Peter Higginson's Little Man Computer Simulator – my students typically find this difficult at first but running and stepping through the simulation helps develop understanding



Figure 3 CPU City Animation for BBC Bitesize by Too Tall Productions explaining the FDE cycle

The main character is the Control Unit. The aim is to complete tasks by fetching instructions from RAM, and then decoding and executing them. The player will help the control unit to navigate through the system architecture, avoiding crashes, fighting malware and solving logic puzzles.

As the game progresses, each level will cover a specific topic of the GCSE Specification.

#### Genre/comparisons:

The game will be a first-person action, adventure game with a focus on solving puzzles to complete tasks.

Similar existing games include Narita Boy, Glitchspace, Inside the Computer, Turing Complete and Tron 2.0



Figure 4 Narita Boy Screenshots

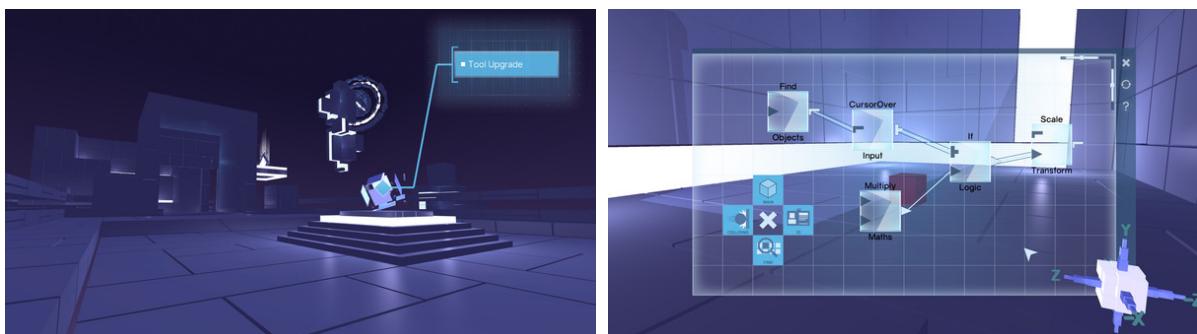


Figure 5 Glitchspace Screenshots

# BSc Computer Science CM3030 Games Development

## Peer-graded Assignment: 1.603 Solo Concept Document

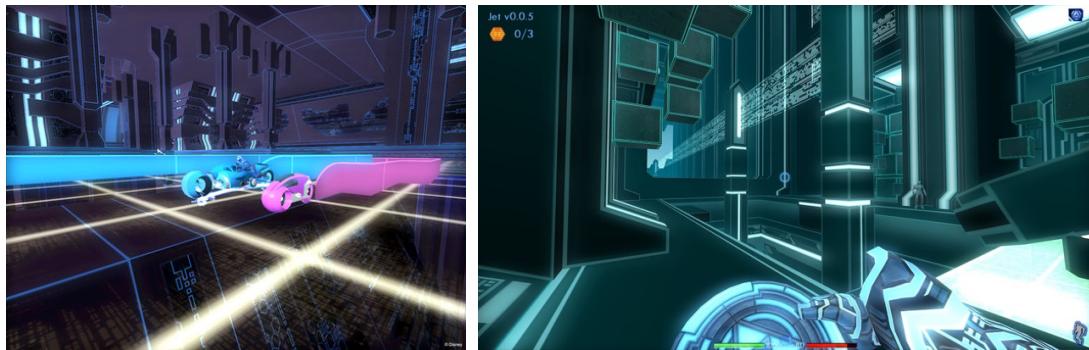


Figure 6 Tron 2.0 Screenshots

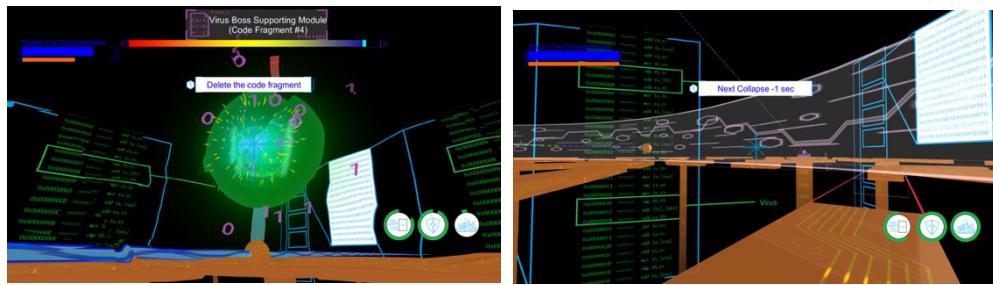


Figure 7 Inside the Computer Screenshots

Existing revision resources are often quite basic and feel educational rather than fun, but this game should be primarily fun to play, with the consolidation of classroom learning as a bonus.

Figure 8 Advanced-ict.com Interactive wall game

Figure 9 Computer Science Revision Games

### **Unique Selling Points (USPs)/features:**

The main selling point is that by completing tasks and challenges based on the GCSE specification the player's neural pathways will be reinforced and they will have a better understanding of complex topics such as SQL, network protocols, Boolean logic, standard algorithms and system architecture.

### **Description of Game:**

Progress is made by completing tasks corresponding to topics in the GCSE specification. The game is played within a web browser, navigating using WASD and controlling actions such as pick up and place by moving towards interactive objects, selecting from menus and sometimes by typing commands or code.

Visually the game takes place within a computer, so the graphics should reflect this but this should be highly stylized/simplified to keep development manageable.

Individual tasks should be completable within 5-10 minutes so that the game can be picked up and put down often or played in longer sessions if preferred. It may be that some elements or clues have to be earned over periods of time – perhaps 25/50 minute revision sessions?

While 'inside computer' environments in existing games often seem to be quite dark and dimly lit, often with Tron-style glowing fluorescent highlights, this game will have a softer colour palette. Sections of the game representing topics, will appear on the game map once unlocked and once complete can be revisited/replayed as a revision tool. Regularly revisiting previously completed topics could be a feature of the game. The player may be able to drag completed topic tiles around on the map to create personalised revision routes.

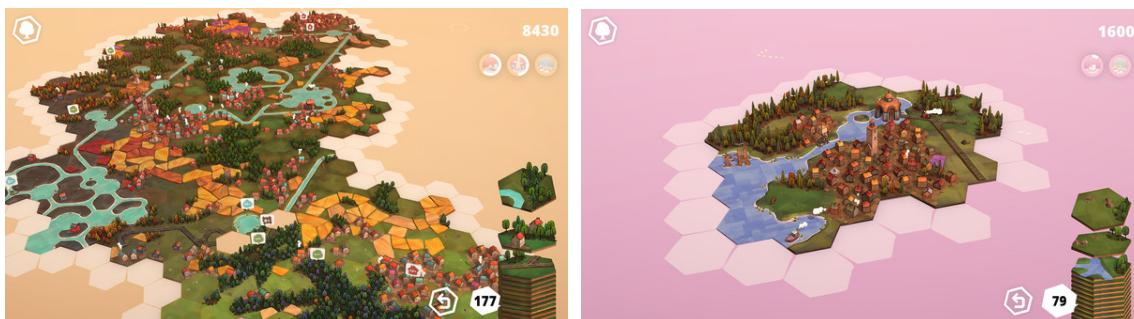


Figure 10 Screenshots from Dorfromantik – a game in which environments are constructed from tiles

### References

1. BBC Bitesize (nd). GCSE Computer Science OCR. [online] Available at: <https://www.bbc.co.uk/bitesize/examspecs/zmtchbk> [Accessed 10 April 2024].
2. Higginson, P. (nd). Little Man Computer. [online] Available at: <https://peterhigginson.co.uk/LMC> [Accessed 10 April 2024].
3. Too Tall Productions. (nd). CPU City. [online] Available at: <https://too-tall.com/> [Accessed 10 April 2024].

# BSc Computer Science CM3030 Games Development

## Peer-graded Assignment: 1.603 Solo Concept Document

4. *Narita Boy*. (2021). PC [Game]. Wakefield, UK: Team 17.
5. *Glitchspace*. (2016). PC [Game]. Inchture, Scotland, UK: Space Budgie.
6. *Tron 2.0*. (2003). PC [Game]. Glendale, California, USA: Disney Interactive.
7. *Inside the Computer*. (2020). PC [Game]. San Diego, California, USA: Zihan Wang
8. Dring, P (nd). *Blog.withcode.uk*. [online] Available at: <https://blog.withcode.uk/2018/11/free-gcse-computer-science-revision-games/> [Accessed 10 April 2024].
9. Advanced-ict.info. (nd). *Connecting Wall GCSE Revision Game*. [online] Available at: <https://www.advanced-ict.info/interactive/wall.php> [Accessed 10 April 2024].
10. *Dorfromantik*. (2022). PC [Game]. Berlin, Germany: Toucana Interactive