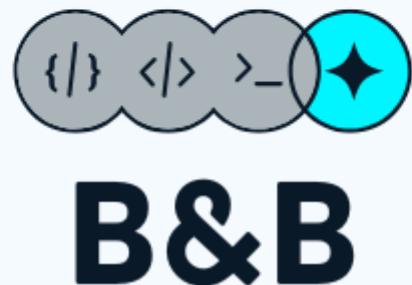


Requirements

Team 8: Ben and Bensons



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Introduction

These requirements are informed by the assessment brief provided by the customer, in addition to the customer's responses to our questions during a meeting on 07/10/2025. In advance of this meeting, the team analysed the brief and noted any essential missing information, mainly regarding implementation details (such as operating systems) and design decisions (such as inclusion of sounds and the structure of the map), to ask the customer about. We also discussed any of the unstated wishes of the customer, such as a leaderboard or multiplayer, and clarified on some vague descriptions in the brief.

The presentation and contents of this software requirements specification (SRS) have been designed primarily under the guidance of IEEE 830-1998[1]. Whilst this standard has been superseded by ISO/IEC/IEEE 29148:2018[2], most of the modern refinements are unlikely to be of concern to a project of this scale. The ambiguity of unrestricted natural language is discussed without specific guidance in IEEE[1, p. 5], so for further guidance we have also taken into consideration more modern discussions of which languages or notations to use for writing an unambiguous SRS[3, p. 12].

Since we intend to use a single requirements document for all stakeholders, we decided that formal notations such as Z-Notation[4] and Clear[5, p. 1050] would not be appropriate nor intuitive for those unfamiliar with them [1, p. 5]. Modern SRSs are predominantly written in *restricted* natural language[6, p. 378], so we've decided to use a particular restriction of English known as ACE[7] as rough guidance. ACE is easy to understand for all stakeholders and restricts grammar to a collection of concise constructs in order to ensure concreteness [7, p. 5]. We are also keeping in mind further cautions outlined in ISO/IEC/IEEE 29148:2011[3, p. 12], such as avoiding statements that are not verifiable.

Within the requirements we will also use the terms *shall*, *should* and *may* to express extents of priority. Throughout this document, these words will be highlighted in a "priority" column in the requirements table and exclusively used with the following meanings:

- *Shall*: If the requirement is not met then the software will be unacceptable.
- *Should*: The requirement is not essential but it would enhance the product.
- *May*: The requirement is acceptable but it is not guaranteed to enhance the product.

These definitions were constructed to minimise ambiguity and subjectivity, mirroring the corresponding definitions of the *degrees of necessity* specified in IEEE[1, p. 7].

IEEE[1, pp. 12–17] discusses separating the user and system requirements into many different sections, such as interfaces, logical database requirements and performance requirements: we believe this to be excessive for a project of this scale, and so we've kept our statement of requirements to three key sections: user requirements (URs), functional requirements (FRs) and non-functional requirements (NFRs). We've had discussions of separating requirements by the "mode" the program runs in, however we concluded that multiple deployed modes would be unnecessary due to the briefness and simplicity of the program. We also decided to use an iterative[8, p. 54] approach to constructing the requirements, making it easier to refine the document if any problems or changes occur. To keep track of changes made, we decided to use an internal requirement repository that tracks which requirements supersede others, which we can then document here whenever significant changes occur.

Simple statement of Requirements

SSON: Tommy needs an exciting, 2D PC game demo designed for prospective students of the UoY where the goal is to escape the university within a five-minute time frame.

User Requirements

ID	Description	Priority
UR_OS_REQ	The game shall be run on desktop as an OS-agnostic file.	Shall
UR_SCALE	The game's graphics should scale with the size of the physical screen.	Should
UR_FAMILY	The game's content shall be appropriate for all ages.	Shall
UR_SINGLE	The game shall be playable by a single person.	Shall
UR_PERS	The game's graphics shall be two-dimensional and top-down.	Shall
UR_PAUSE	The game shall be able to be paused at any time and shall start in a paused state.	Shall
UR_TIMER	The screen shall have a timer which counts down from 5 minutes whilst the game is unpause.	Shall
UR_WIN	The game shall be won when the player escapes the map.	Shall
UR_LOSE	When the timer reaches 0 the game shall be lost.	Shall
UR_AUDIO	The game should have mutable and adjustable audio features.	Should
UR_KEYBIND	The game shall use intuitive and well-understood controls.	Shall
UR_SAVE	The game may offer both saving and loading features.	May
UR_ACCESS	The visuals may be accessible for colourblind users.	Shall
UR_MAP	The game's map shall be a maze with locations similar to those at the university.	Shall
UR_PATHS	The player's movement shall be constrained to specific paths on the map.	Shall
UR_ALT_PATHS	The map may contain multiple different correct paths.	May
UR_CHAR	The player may be able to select from a number of character appearances.	May
UR_HIDDEN	The game shall have at least three hidden events which are triggered by interactions	Shall
UR_HINDRANCE	The game shall have at least five visible events which hinder the player.	Shall
UR_BENEFIT	The game shall have at least three visible events which benefit the player.	Shall
UR_EASE	The game's difficulty should not be frustrating for inexperienced players.	Should
UR_INSTRUCTIONS	The game shall provide clear instructions accessible from the main menu.	Shall
UR_MENU	The game shall have a main menu with at least three options: Play, Instructions and Quit.	Shall
UR_END	The game shall display a win or loss screen upon game completion.	Shall
UR_GRAPHICS	The game's interface and visuals should be easy to follow and consistent.	Should

Functional Requirements

ID	Description	User Requirement	Priority
FR_MUSIC	When the game is opened, music should play and the music should loop until the game ends.	UR_AUDIO	Should
FR_MUTE	When the game is paused, it should have a "mute" button which toggles the audio.	UR_AUDIO	Should
FR_VOLUME	When the game is paused, it should allow the user to adjust the volume of all audio.	UR_AUDIO	Should
FR_SAVE_LOAD	When the game is paused, its state may be saved and a previous state may be loaded.	UR_SAVE	May
FR_MAIN_MENU	When the game starts, the main menu shall be displayed, providing options for Play, Instructions and Quit.	UR_MENU	Shall
FR_INSTRUCTIONS_SCREEN	Selecting "Instructions" shall display the controls and gameplay objectives.	UR_INSTRUCTIONS	Shall
FR_PLAY	Selecting "Play" shall transition from the main menu to the active game screen.	UR_MENU	Shall
FR_QUIT	Selecting "Quit" shall close the game application.	UR_MENU	Shall
FR_MOVEMENT	The player shall be able to move using arrow keys or WASD keys.	UR_KEYBIND	Shall
FR_COLLISIONS	Player movement shall be constrained by maze boundaries and collision detection.	UR_PATHS	Shall
FR_PAUSE_MENU	Pressing the pause key (ESC) shall open a pause menu with options to resume and quit.	UR_PAUSE	Shall
FR_RESUME	Selecting "resume" shall return to the active game screen from the pause menu.	UR_PAUSE	Shall
FR_TIMER	The game shall display a timer that starts when gameplay begins and counts down only whilst the game is unpause.	UR_TIMER	Shall
FR_LOSE_CONDITION	When the timer reaches zero, the game shall transition to the end screen showing a loss message.	UR_LOSE	Shall
FR_WIN_CONDITION	When the player reaches the designated 'Central Hall' area, the game shall transition to the end screen showing a win message.	UR_WIN	Shall
FR_END_SCREEN	When the user wins/loses a game, an end screen shall display the results of the game.	UR_END	Shall
FR_BENEFICIAL	The game shall contain beneficial events triggered during play.	UR_BENEFIT	Shall
FR_HINDRANCE	The game shall contain hindering events triggered during play.	UR_HINDRANCE	Shall
FR_HIDDEN	The game shall contain hidden events triggered during play.	UR_HIDDEN	Shall
FR_CHAR	When paused, the player may be able to change the appearance of their character sprite	UR_CHAR	May

Non-Functional Requirements

ID	Description	Fit Criterion	User Requirement	Priority
NFR_OS_REQ	The game shall be run via a platform-agnostic desktop file.	The game successfully runs on Windows and two other desktop operating systems.	UR_OS_REQ	Shall
NFR_PERS	The game's sprites shall be from a 2D, top-down perspective.	At least three unfamiliar users agree that every sprite in the game files is recognisable under the given description.	UR_PERS	Shall
NFR_HELP	The controls shall be easy to use for the player.	At least three unfamiliar users are able to successfully control the game without external instruction.	UR_INSTRUCTIONS	Shall
NFR_FILE_PATH	The game's capacity to run shall not depend on the root directory.	The game successfully runs with the root folder placed in two different directories.	UR_OS_REQ	Shall
NFR_RESOLUTION	The game's window should scale to fit the resolution of the user's screen.	The game successfully scales up/down between 2 different test screens.	UR_SCALE	Should
NFR_FAMILY	The game shall not hold any content that would take it above the PEGI-12 age rating.	The game does not meet any of the criteria to be classed as PEGI-16 or PEGI-18 as opposed to PEGI-12	UR_FAMILY	Shall
NFR_SINGLE	The game shall not have any form of multiplayer.	At least three unfamiliar users agree that no features give the ability for multiple users to connect and play together.	UR_SINGLE	Shall
NFR_PAUSE_DELAY	There shall be a negligible delay between the game pausing and the timer pausing in sync.	During testing, mean delay over at least 3 recordings is less than 0.1 seconds.	UR_PAUSE	Shall
NFR_ACCESS	The game shall be visually accessible to colourblind users.	An unfamiliar user is able to play the game comfortably in greyscale without any issues.	UR_ACCESS	Shall
NFR_EASE	The conditions to win the game should not be frustrating to satisfy for the player.	At least 3 unfamiliar users, who are self-considered to be unfamiliar with video games, agree that it isn't frustrating or too challenging to complete.	UR_EASE	Should
NFR_MAP	The game map shall have locations that resemble those of the University of York	At least 3 users who are university students/staff members recognise locations on the game map correlating to the university.	UR_MAP	Shall
NFR_ALT_PATHS	The game map's route may contain multiple correct paths to the exit.	At least 3 familiar users agree that there are multiple paths to the win condition.	UR_ALT_PATHS	May
NFR_GRAPHICS	The UI and visuals should be clear, consistent and readable.	At least 3 unfamiliar users agree that the UI and visuals are clear, consistent and readable.	UR_GRAPHICS	Should
NFR_MAZE	The paths the player can take shall resemble a maze.	At least 3 familiar users agree that the layout of the paths available to them resemble a maze.	UR_MAP	Shall

References

- [1] 830-1998 - *IEEE Recommended Practice for Software Requirements Specifications*. [Online]. Available: <https://ieeexplore.ieee.org/document/720574>. [Accessed: 09 Oct. 2025].
- [2] ISO/IEC/IEEE 29148: 2018(E): *ISO/IEC/IEEE International Standard - Systems and software engineering -- Life cycle processes -- Requirements engineering*. 2018.
- [3] 'ISO/IEC/IEEE International Standard - Systems and software engineering -- Life cycle processes -- Requirements engineering', *ISO/IEC/IEEE 29148:2011(E)*, pp. 1–94, 2011.
- [4] M. Spivey, *The Z Notation: A Reference Manual (Second Edition)*. Prentice Hall, 1998.
- [5] Rod M. Burstall and Joseph A. Goguen, 'Putting Theories Together to Make Specifications', in *International Joint Conference on Artificial Intelligence*, 1977[Online]. Available<https://www.ijcai.org/Proceedings/77-2/Papers/095.pdf>[Accessed: 9October2025].
- [6] X. Franch et al., 'The state-of-practice in requirements specification: an extended interview study at 12 companies', *Requirements Engineering*, vol. 28, no. 3, pp. 377–409, Apr. 2023.
- [7] N. E. Fuchs and R. Schwitter, 'Attempto Controlled English (ACE)', Mar. 13, 1996[Online]. Available<http://arxiv.org/abs/cmp-lg/9603003>[Accessed: 9October2025].
- [8] D. Firesmith, 'Modern Requirements Specification', *J. Object Technol.*, vol. 2, pp. 53–64, 03 2003.