Software Requirements Specification

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UNBLOCK ME

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1)Introduction ::

As a part of C++ project, we are developing a very addictive but equally brain teasing Game which is called as Unblock Me.

Without any difficult rules and regulations, Unblock Me is a simple game but it needs forward and logical thinking and visualization to solve each stage.

Purpose :

User will improve his thinking skill and enjoy the different levels of puzzle of unblock game. Besides it is very addictive puzzle game!

Problem Statement :

a) Giving the user a solvable Unblock me puzzle (which does not have a unique solution), and finally checking the time given in seconds and the number of moves he made . Calculation of the highest scores will be done. High scores of each level of difficulty will be displayed which will consist of the minimum number of moves and minimum time he has taken.

b) Making a high score in time means to solve the given problem in minimum time.

Making a high score in moves means to solve the given problem in minimum time.

(This is screenshot of similar game unblock me on Android OS)

There will be random arrangement of blocks of different lengths, and there will be a Red block and also there will be opening on the right side of the wall of the box containing these blocks.The Player has to move the Red block through the right side to clear the stage. The Player must move the blocks according to the given Constraints.

APPROACH :

User is given a predefined configuration of the blocks (figure). To finish the stage,
the user will have to rearrange the grid by moving the rectangles with informed constraints in such a way that the special block i.e. Red Block could escape the grid .Score will be calculated by taking into account the time and number of moves taken to solve the puzzle . The score will be checked against the highscores after every game and the high scores will be altered accordingly.

SCOPE :

This game is meant for pure entertainment for people who enjoy playing logical and level games and of course Unblock Me.
We are sure it will attract more fans like people on the go and hungry for more. It can be replicated easily onto any mobile platform. For now it will be employed as a PC
mini-game on both Windows and Linux platform. We wish to take it a bit different by introducing intuitive GUI and various new challenging levels.

1.1) Definitions, Acronyms and Abbreviations ::

Box : The 6x6 sq. units area containing Blocks and has a Opening of length 1 unit on the right edge.

Blocks : 3x1 & 2x1 sq. units rectangular structures contained inside The Box.

Red Block : A Red colored 2x1 Block (the one which player should move through the Opening to clear the stage).

1.2) References ::

- *"An introduction to programming through c++" by Abhiram Ranade*
- www.stackoverflow.com
- www.cse.iitb.ac.in/~cs101/
- www.lazyfoo.net/

2) Overall Description ::

The game will be consisting of several functions that will ensure smooth flow of the game without the occurrence of any error.

2.1 Product Perspective :

The product is independent and self-contained project and the main purpose pf this project is to give the user something entertaining and educational. Since this game need logic and crucial thinking, it is a perfect game for users who enjoy game which require thinking skill.

2.2Product Functions :

The number of functions that the software will perform is explained in detail as the following.

On opening the game, first a screen will pop up and will display different option:-
1) Start the game :- On clicking this, the user will be able to start the game
2) Instructions :- On clicking this, the user will be able to know what exactly he has to do in
order to finish the game and also will get to know what is the game about.

3) High score :- On clicking this, the user will get to know the minimum number of moves and the minimum time he has taken for every level since the time he has started playing the game.
4) About :- On clicking this, the user will get to know the participants who have taken part in the making of this game.

On clicking Start the game, a screen displays the level number and the user will not be able to play the level number if the previous level number has not been completed. On clicking on a valid level, the level starts and the time will start at the same time. As the level runs, the number of moves the user has taken since the start of the game will be displayed. The Home option, the menu option, the pause option and the restart option will be displayed and on clicking an option, the necessary function will be performed. On top, the level number and the difficulty level will be displayed.

The user would have to move the red block to the exit on the left. But it won't be able to if any block is blocking its way. All blocks will be rectangular and can move only in the direction parallel to its longer side. No block cannot pass through any other block. Thus the user has to click on the block he/she would like to move and has to press the respective direction key on the keyboard to move the block. The part of the screen which contains the blocks have been divided by the game developer into calculated parts and so on clicking the block and pressing the respective direction key, the block will move one unit. Once the user is able to move the red block to the exit, the next level will start..

2.3 User Characteristics :

When the user clicks on an option button, the respective function will be performed and all the functions performed by each option button is explained above. Clicking anywhere else will result in no change. During the running level, the user will click on the block which he/she would like to move and will press the respective direction key on the keyboard to move in the required direction. On clicking anywhere else will not change anything. The user will not be able choose more than one block. If he/she does, the previously selected block will be get unselected.

2.4 Constraints :

The blocks will move only in the direction parallel to the longer side of the block chosen to be moved.
No block can move through any other block.

Only one block can be moved at one time.
The red block will move horizontally only.
There is a finite calculated space where the blocks will appear and the user can only move the blocks within that space.
The user cannot play the levels that are after the level which has not been completed yet.

2.5 Assumptions and Dependencies :

We are assuming that player has basic knowledge of operating computer and giving input through mouse and keyboard, and no other special knowledge is required.

The program is completely dependent on CodeBlocks with GNU compiler and Simplecpp and SDL library included. To keep all the blocks within the given space in the running level when the user moves the blocks.

3 Details ::

3.1 Functionality :

At the start of each stage player will be given the Box with random arrangements of The blocks and red Block as usual at its position. While solving the stage, user has to click on the block he/she wants to move and then has to press the keys on the keyboard for the movement of the block and then block will move accordingly if it satisfies the Constraints This can be achieved by using functions from Simplecpp library.

Once the Red block reaches the opening on the left side of The box, Level clear message with time taken to solve clear the level will be shown and player will be asked if he/she wants to play next level or quit.

If abnormal inputs are given nothing will happen. If user clicks on more than one block, the block with last click will be selected. There will be constraints, so that user can't move blocks one over other. Proper function for dealing with these conditions will be included in the source code.

3.2 Supportability :

This section states the requirements needed for the game to run.

Thus the necessary requirements are that the user has to have a minimum 500MB RAM and a 2GHz processor. He/she also needs to have the SDL library in order to run the game.

3.5 Interfaces :

3.5.1 User Interfaces

The software uses Graphical User Interface implemented using SDL (Simple

DesignMedia Layer) and init canvas (from Simplecpp library).

3.5.2 Hardware Interface

The software requires only the basic hardware-monitor,keyboards. Running locally the software has no special hardware requirement.

3.5.3 Software Interfaces

Unblock me will directly interface with GNU compiler which in turn will be interfacing with the operating system and any other software components it requires.

4) Risk Management ::

Some of the possible risks are-

- graphics may be too complex to implement.
- Limited knowledge of SDL may prove to be a hurdle.
- Keeping time as well as number of moves as a parameter for high score may be difficult as it involves running more than one loops simultaneously.

TACKLING THESE RISKS :

Complexity of graphics is expected to be simplified with the help of SDL but this may increase the scope of difficulties caused by limited knowledge of SDL, we may be able to solve this problem using initCanvas .In other words, quality of graphics must be up to an optimum level.

Keeping in mind the problem indicated in point **5.3**, other parameters for deciding high score must be considered, one of the possibility is to set number of

moves taken to finish a level as the parameter for deciding high score (lesser the number of moves, greater will be the score).

5) Scope For Extention ::

The stages of the Unblock Me can be designed by a Random level generator algorithm, so that we don't need to design each level manually.

Also variety of graphics can be added i.e. to make blocks more stunning.

Further advancement can be done in automatic Unblock me solver that is, when given block positions, it will give the steps to follow to clear the level.