Final Report

Gold Miner

CMPT 215
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Contents

Project Description

    As a gold miner, one should gather golds as much as possible. However, there are also bombs underground, which are dangerous. Once touching a bomb or gathering all golds, score will be displayed on console and the game will be over.

Design Specification

Achieve a playable game

1. Initialization
   a. Set memory represent left moost memory to 0x10000000
   b. Add barrier to map and print with color
      i. Add north barrier
      ii. Add south barrier
      iii. Add west barrier
      iv. Add east barrier
   c. Add ground
   d. Add start anchor
      i. Save anchor position to fixed register
2. Read input
   a. If a, goto move left
   b. If d, goto move right
   c. If s, goto throw anchor
3. Move right/left
   a. +4/-4 to anchor register to move address and print
   b. Recrusive moving until reach barrier
   c. Use a register to control anchor not move over barrier
4. Throw anchor
   a. Set ground below memory to black
   b. Move anchor down
   c. Recursion until the the anchor reach south barrier/gold/explosive
   d. Move up if reach gold/south barrier, else end game
5. Move up
   a. Anchor register and gold register   -128 to move up
   b. If anchor reach north barrier, reduce gold amount by 1
   c. Increase mark by gold size
   d. Reset ground to white
6. Create gold/explosive
   a. Set some random memory to a specific value(Exp. 3,4)
   b. When print memory read such value, it print yellow(3)->gold, red(4)->exlosive
7. End game
   a. If all 10 golds are collected, print "Win" and show Mark
   b. If anchor reach an explosive, print "Lose" and show Mark
   c. If esc pressed, print the mark only.

Project Goals
1. Initialization
2. Add move left/move right/ move down
3. Add create gold/ explosive
4. Add move up
5. Add show mark, win/lose

READ ME
1. Download GoldMiner.asm
2. Open Mars4.5
3. Open File
   Click "file" -> "open"; Find the GoldMiner.asm file; Select it; Click "open"
4. Program Preparation
   a. Click "Tools" -> "bitmap display"
      Set "Unit Width in Pixels" to 16
      Set "Unit Height in Pixels" to 16
      Set "Display   Width in Pixels" to 512
   b. Set "Display Height in Pixels" to 512
   c. Set "Base Address for Pixels" to 0x10000000(global data)
   d. Press "Connect to MIPS" button
   Click "Tools" -> "keyboard and display MMIO simulator"
      Press "Connect to MIPS" button
5. Run Program
   a. Click icon "assemble the current file"
   b. Click icon "Run the current program"
6. Play game
   a. Display Description
      Red square object: bomb
      Yellow square object: gold
      White bar object: ground
      Green bar object: border
   b. Control Description
      A: keep anchor moving left
      D: keep anchor moving right
      S: throw anchor towards targets
      Esc: display final mark and exit
   c. Possible catch result
      Catch gold: add score
      Catch bomb: game over
      Catch nothing: anchor back
7. Type "A, S, D, Esc" on "KEYBOARD" text area of "keyboard simulator" to send instructions.
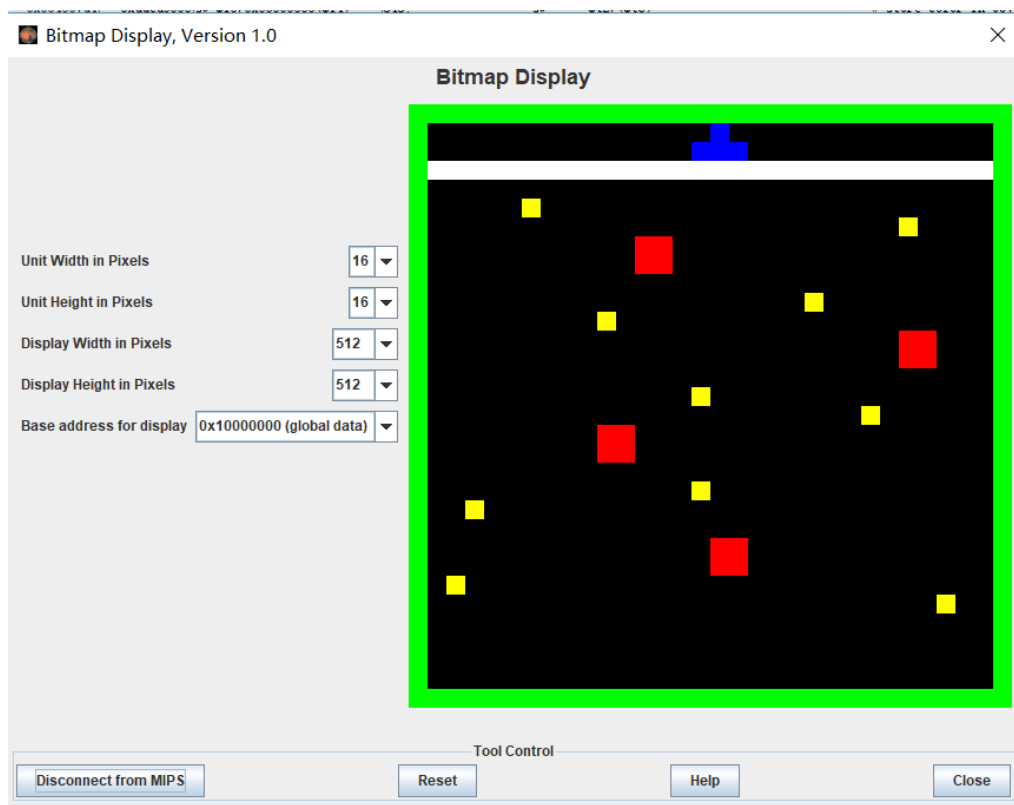
Note: In order to restart the game, repeat steps 5-7.
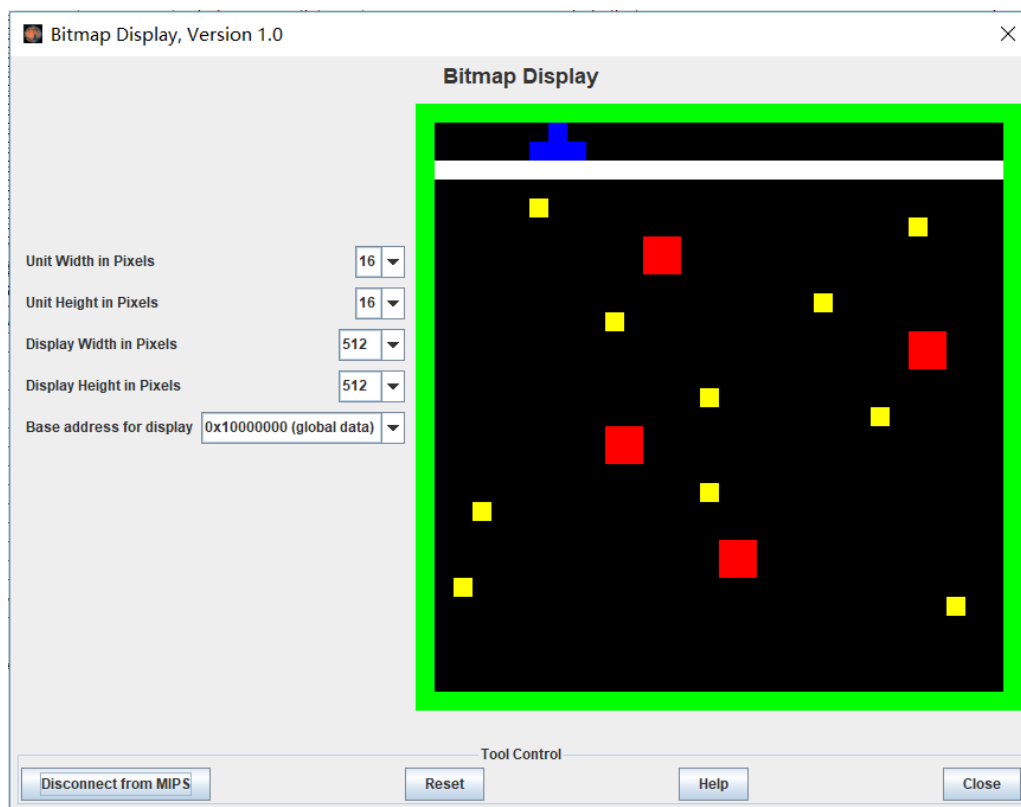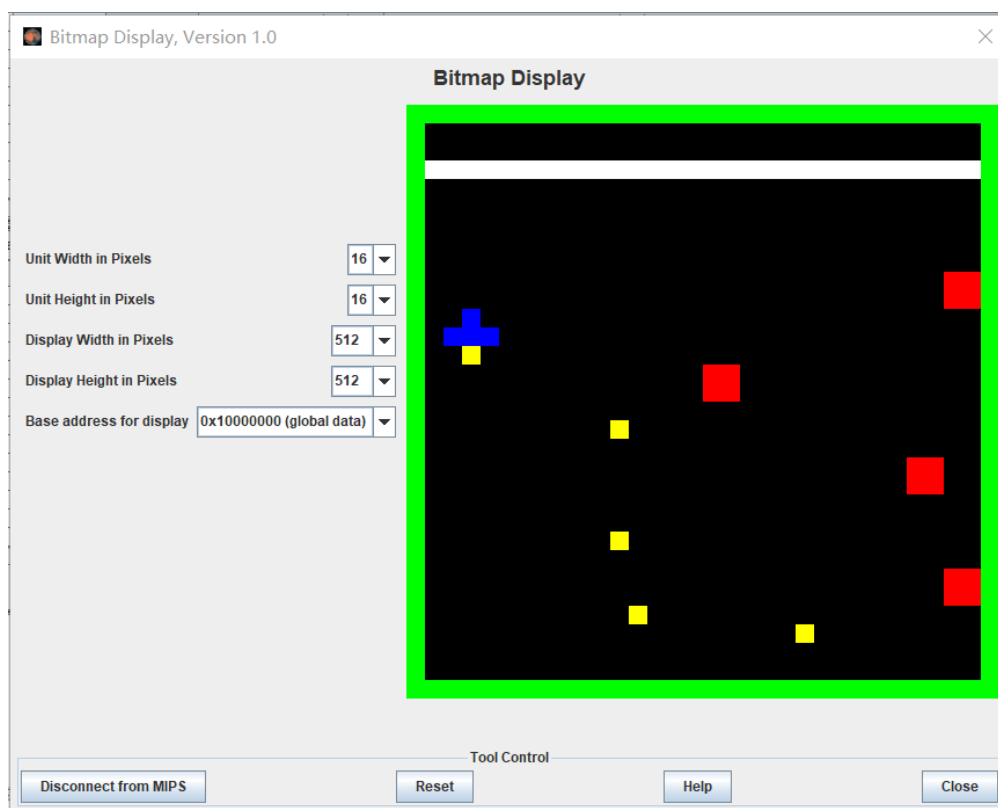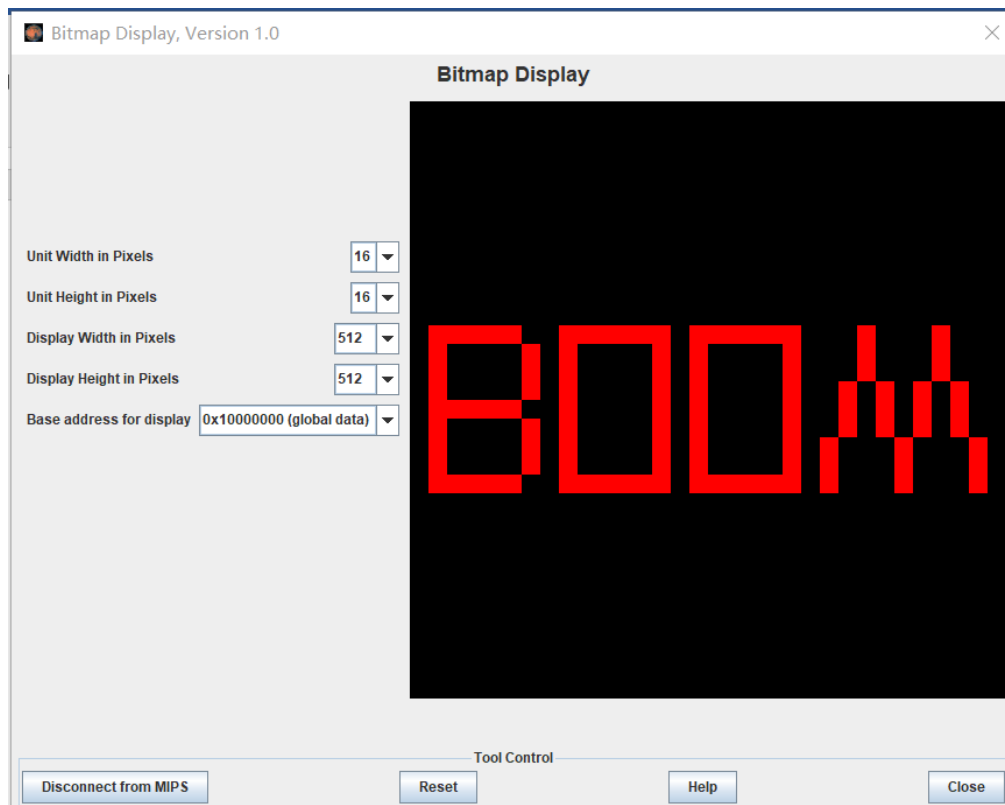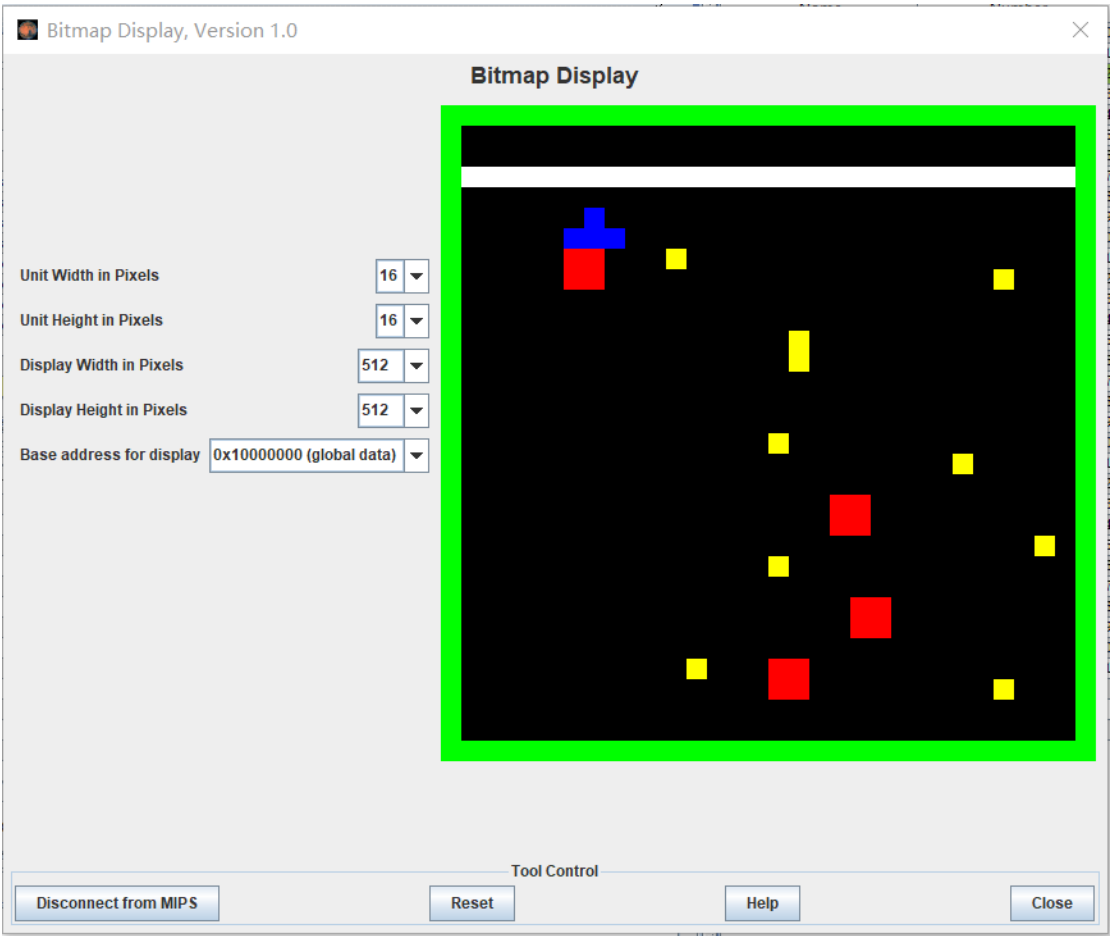
Sample Output

Initializaion
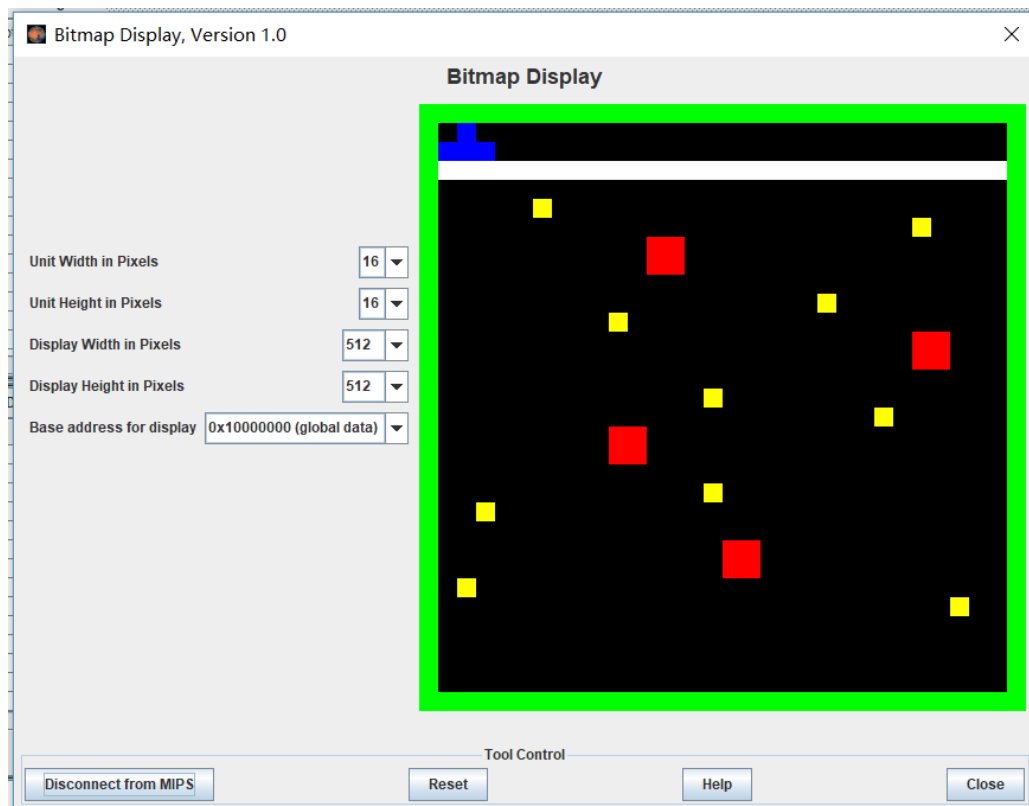
Moving right

Moving left

Collect gold

Win
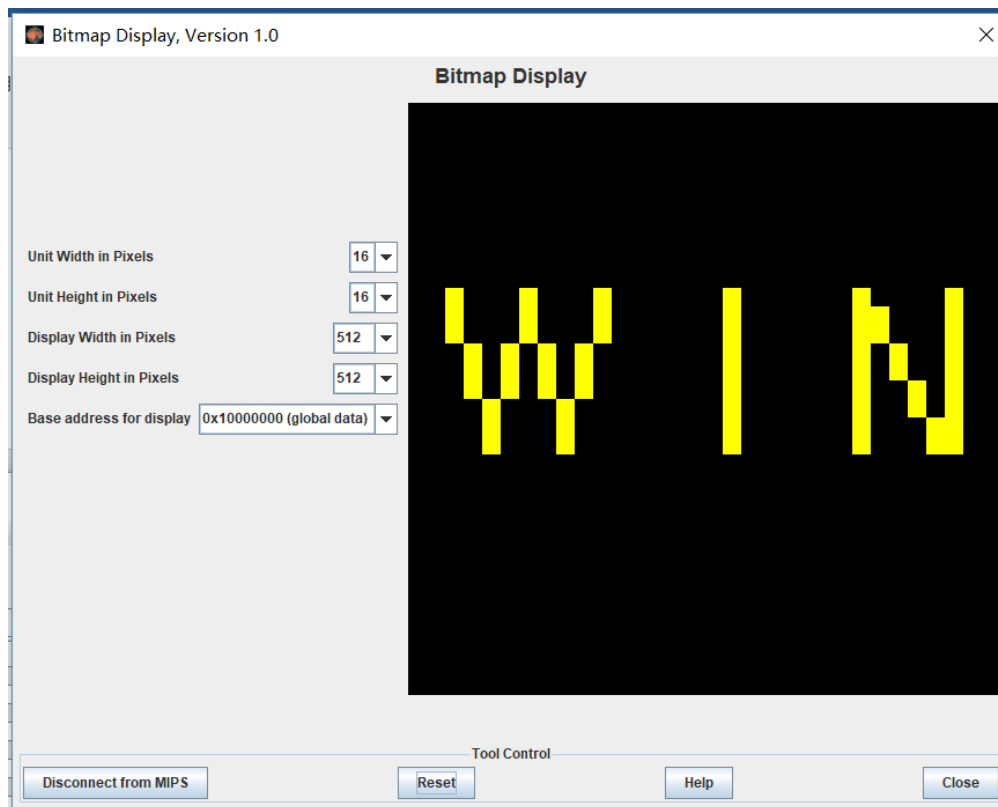
Lose

Touch bomb

Console Output

Your score is: 0	Your score is: 10
-- program is finished running --	-- program is finished running --

Display Type
1. Console display mark and end game, graphic display the whole game
2. 512 * 512, 16*16 per pixel
3. Start at 0x10000000

SVN log of team repository

svn log https://svn.cs.usask.ca/svn/student/215/bgb
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r13 | xil865@USASK.CA | 2017-08-14 10:00:38 -0600 (Mon, 14 Aug 2017) | 1 line

update address for gold and explosive creation
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r12 | xil865@USASK.CA | 2017-08-10 14:38:43 -0600 (Thu, 10 Aug 2017) | 1 line

Move up completed, map modified
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r11 | yul040@USASK.CA | 2017-08-03 13:32:54 -0600 (Thu, 03 Aug 2017) | 1 line

Fixed error: occasionally gold and explosive at same memory address
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r10 | yuh347@USASK.CA | 2017-08-03 12:40:03 -0600 (Thu, 03 Aug 2017) | 1 line

Remove unneccessary comments, display score when press Esc
----

r9 | yuh347@USASK.CA | 2017-08-02 10:57:13 -0600 (Wed, 02 Aug 2017) | 1 line

Add win and loose diagram; Add score counter and display on console after gaveover; Call turnBlack at the begining of the game
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r8 | yul040@USASK.CA | 2017-07-26 12:21:06 -0600 (Wed, 26 Jul 2017) | 1 line

gold create and explosive create
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r7 | yug242@USASK.CA | 2017-07-26 12:12:07 -0600 (Wed, 26 Jul 2017) | 1 line

read input to move anchor left/right/down
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r6 | yul040@USASK.CA | 2017-07-21 14:06:09 -0600 (Fri, 21 Jul 2017) | 1 line

cease anchor movement right upon south barrier is reached
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r5 | yug242@USASK.CA | 2017-07-21 12:34:40 -0600 (Fri, 21 Jul 2017) | 1 line

fix bug for breaking ground barrier while moving downward

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r4 | yug242@USASK.CA | 2017-07-17 17:25:38 -0600 (Mon, 17 Jul 2017) | 1 line

fix bug for anchor movement-left,right boundary
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r3 | yug242@USASK.CA | 2017-07-17 14:09:14 -0600 (Mon, 17 Jul 2017) | 1 line

format adjustment, comment reestablished, move down delay added
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r2 | yug242@USASK.CA | 2017-07-16 13:31:35 -0600 (Sun, 16 Jul 2017) | 1 line

control action added to move left right down from keyboard instruction
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r1 | yul040@USASK.CA | 2017-07-15 11:54:01 -0600 (Sat, 15 Jul 2017) | 1 line

initialization of svn and project file

Completion Date	Description
July 11th	Goal set
July 13th	Allocation of tasks
July 15th	Initialization of game Generate anchor, ground and barrier of game
July 16th	Basic movement of anchor (left/right)
July 17th	Basic movement of anchor (down) Fix bug
July 21th	Fix bug
July 26th	Read input from keyboard to move anchor Generate golds and explosive
August 2nd	Add win and loose diagram Add score counter and display on console after gaveover
August 3rd	Fix bug
August 14th	Update memory address of midpoint to avoid gold "eaten" bug

Failure

1. Game can occasionally never going to win because the gold is located under explosive. The reason is gold and explosive is randomly distributed on separate line, so it is hard to control the output vertically.
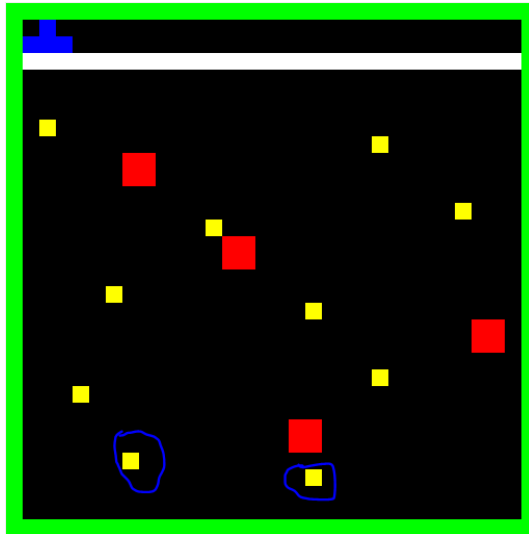
The circled gold is unreachable.

2. Game display quality could be largely improved if pixels are 1024*1024(currently 512*512)

3. One difficulty is to build a store where super power could be purchased,such as recover after bomb is touched or eliminate some bombs.