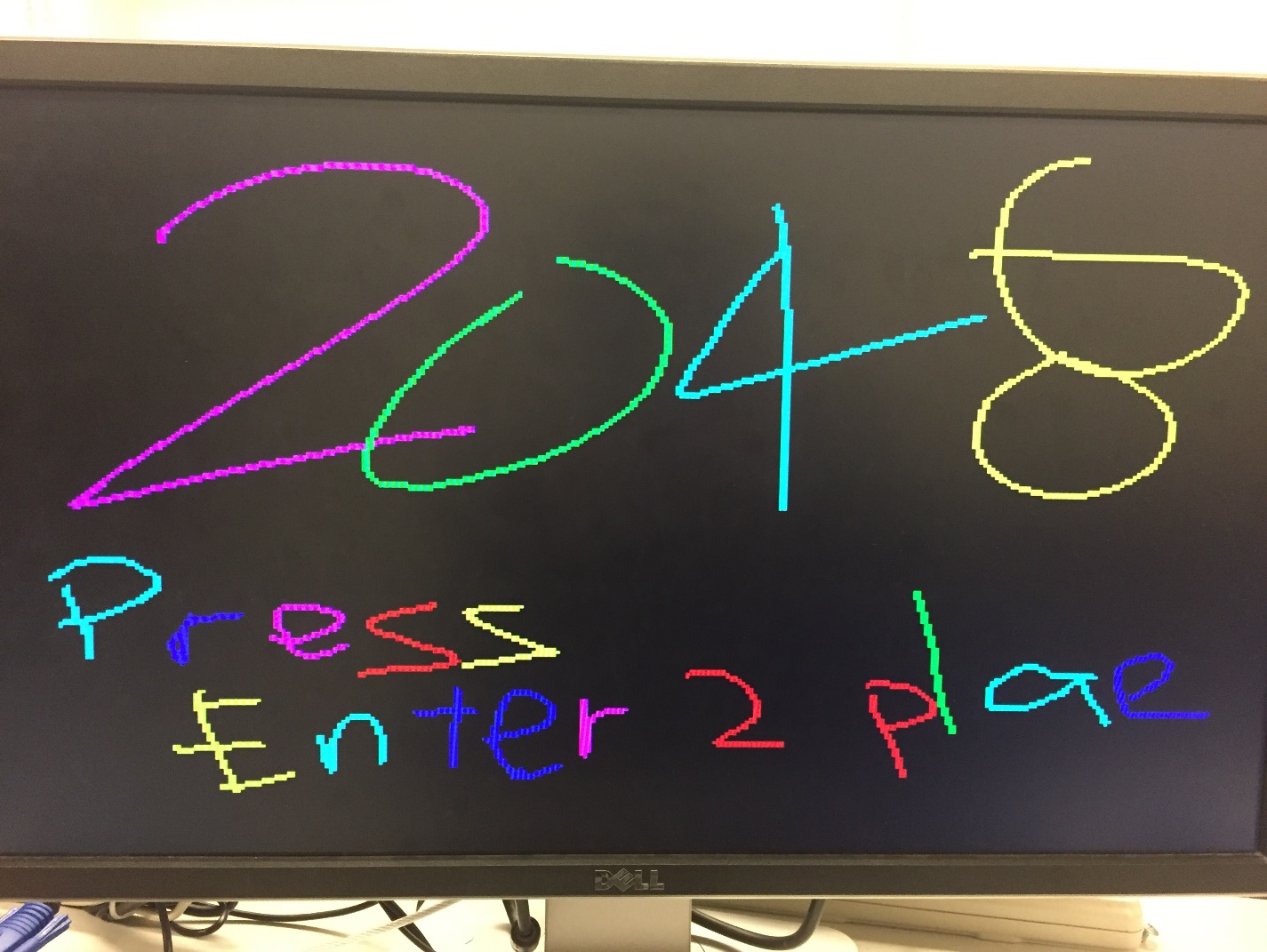
ECE 241 H1 F

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| Project – 2048 Game | | |
| Lab session | PRA 0104 Monday 3 – 6pm | |
| TA | Ehsan Alimohammadian | |
| Students | Sheng Zhao | 1003273913 |
| Yuwen Zheng | 1001075463 |

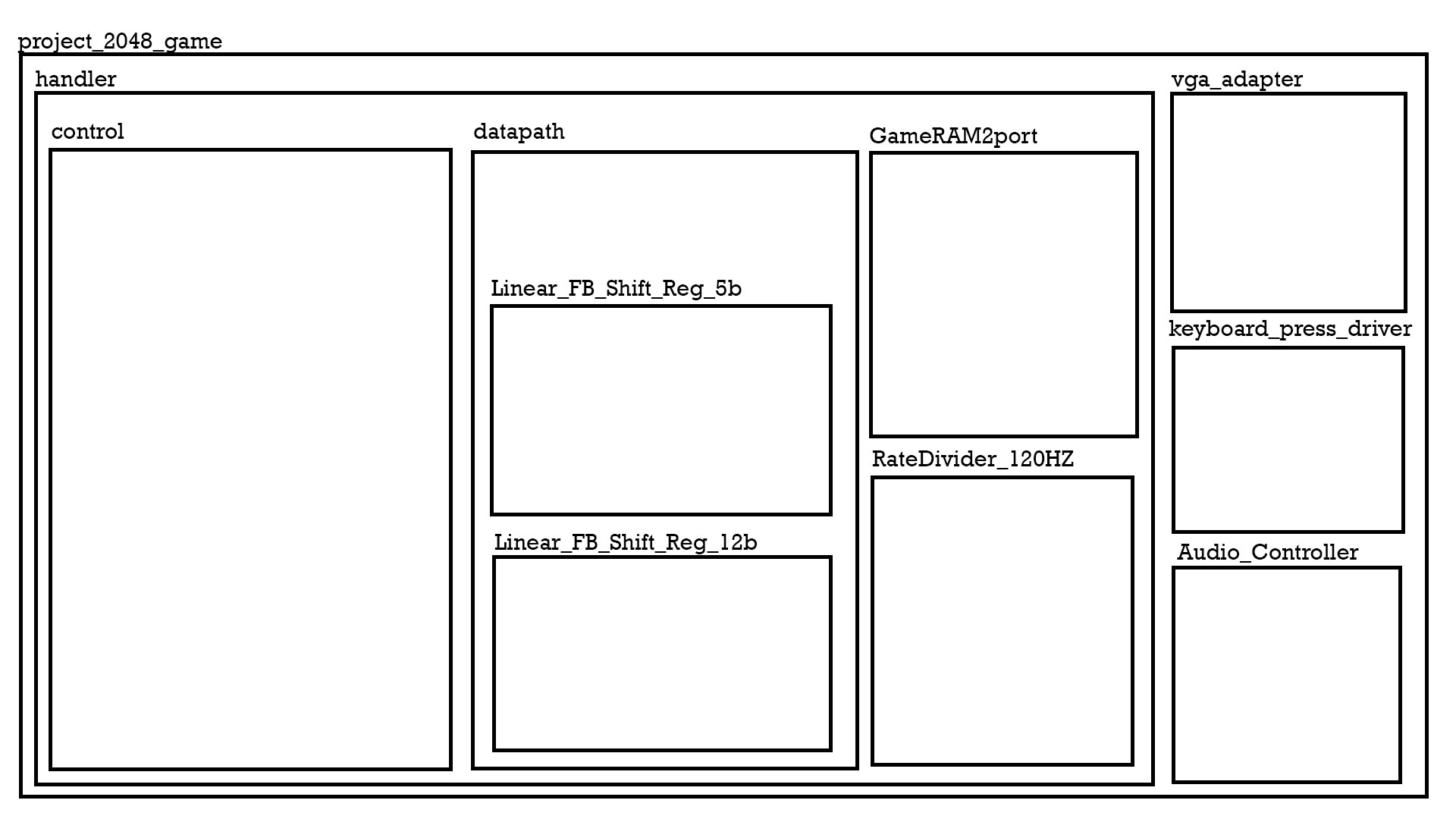
**Introduction**

Our project was to implement the popular mobile game 2048 on the De1-SoC board. We have decided on this game due to its challenging game algorithm we needed to implement but it still being manageable as there are only 4 inputs from the user and only 1 winning and losing state.

The game is played on a 4 by 4 square board with the goal being to merge similar numbers, which are all powers of 2, to form the largest possible number. Each turn, the player can select up, down, left or right, which corresponds to a movement of all the numbers on the board in that specified direction. Any similar numbers who collide are merged to form a new number double the size (or sum), and a new random number is spawned on the board. The player wins if he attains the number 2048, and loses if there is no longer a valid move left on the board.

Many variants of the game exist, each having their own quirky mechanics, but for our project we will be looking at the original version [1].

In total, the project took about 60 hours to complete, a full timeline can be found in the appendix (Appendix A).

**The design**

**Figure 1: Overview of Verilog modules**

The main modules of the game can be seen in Figure 1. Both VGA and audio controller modules are found on EECG’s website [2], and the keyboard module is sourced from the University of Washington [3]. The handler module acts as a bridge for the 2 main modules, control and datapath to communicate. Logic is handled within the control module, whereas all the actual computation is done in the datapath module. The rest are helper modules to facilitate computation. A more detailed explanation of all modules can be found in the appendix (Appendix B).

**Game Operation**

The entire game’s operation can be broken down into three parts to help understand how each part works and when they transition between the states.

**Game initiation**

Upon programming the board, the FSM is initialized to the TITLE\_SCREEN state, which simply waits for a signal to start the main initialization sequence of the game. This coupled with the .MIF file used to initialize the VGA RAM forms our title screen.

Pressing the enter key (or SW[8]) starts the main initialization sequence. First the game RAM is cleared, done by having a counter looping through all 16 possible squares and writing each spot to have a value of 0, which signifies an empty spot. The address for the RAM is the coordinates of each square, with X begin the horizontal, Y the vertical, starting at 0000 from the top left to 1111 in the bottom right.

Next, the game will draw this empty board and the high score data to the screen. Simply put, a counter loops through then entire 320 by 240 pixels screen and at each pixel, the color determined by a (massive) set of if-else statements. For the text and borders, this is straight forwards and we simply check for coordinates corresponding to the pixels we need to draw (that is, a non-black color). For the actual game board, we would need to determine three things, which square is the current pixel in, what value is present in that square, and what is the effective coordinate of that pixel within the square. To find which square the pixel is in, with the knowledge that the board is 240 by 240 pixels large, and each square being 57 by 57 pixels (outer borders are 3 pixels thick and inner separation lines are 2 pixels thick), a simple if-else statement would give us the coordinates of the square. We then take this coordinate and retrieve the value present in the square. Finally, an equation is used to find the effective X and Y coordinates within said square (i.e. a X coordinate of 180 on the screen would be effectively the X coordinate of 0 in the third column of squares). With all this information we can finally traverse the massive if-else statements to decide on the color to plot. This method is rather complicated and requires many more states than if ROMs are used, which will be further discussed in a later section.

After drawing the empty board, a new number must be spawned in. The coordinates are the 4 most significant bits of a pseudorandom Linear Feedback Shift Register of 5 bits. 5-bit LFSR is required since having 4 bits would mean that coordinate 1111 can never be chosen since LFSR cannot generate an all 1s output (which would also stop it from working further). Every time a new number is chosen, the corresponding spot on the board is checked, if it is empty, we can spawn in the number and carry on, else we get a new one.

Finally, we draw in the random number. This draw process is separated for it to be animated. A counter (cascading counter) counts from 0 to 57 and a similar counter (initialized to the square of this random number) counts through the pixels. However, each cycle we only draw up to the number in the cascading counter, after which we increment the cascading counter and wait for a 120 Hz signal for the next cycle. As a result, we can animate in the newly spawned number.

**Game algorithm**

After the initialization process, we end up in the GAME\_WAIT\_FOR\_MOVE state, where we wait for a user input. Upon receiving a user input (and the release of the signal), we begin the calculation process. Due to symmetry of the 4 different moves, we will just explain one of the possible moves, UP.

To process the move UP, we will be checking the board towards the opposite direction, that is, top to bottom. This will ensure that we always move the numbers first, instead of merging them in the middle of the board, which may lead to wrong calculations. Note also that since we are moving in the vertical orientation, the order at which each square in each row is checked is irrelevant, but for convenience sake we will always be doing the non-important axis (the one we are not moving in) in an incremental fashion (from 00 to 11).

Now for the logic, for each square, there can only be 3 possible next steps, either the number does not move, the number moves and merges with the next square, or, the number simply moves to the next square.

For a number which does not move, it could be either that the number is in a square along the boundary (in our case now, the top row), or the square is next to another (in the direction the user specified, i.e. UP) containing a different number that the current one.

For move and merge, the next square must be of the same number.

For simply move, the next square must be empty.

To implement this logic, we set up two counters. An iteration counter for the number of times the board has been checked and another for looping through all the squares. Every square we check for the 3 types of next steps mentioned above and the respective signals are switched on to select our next state. For no move, we simply move to the next square. For merge moves, we increment the next square (a single left bit shift since our numbers are all powers of 2) and then update the current to 0. For just move, we just update the next with the current value and set the current square to 0.

This process is required to be repeated for a maximum of 4 times before all the possible updates are made. A few more were added for insurance and to allow the high score counter to update which each user input (instead of the next). High score is simply stored in a register and updated as we retrieve each square’s value.

After this, the same process is repeated for drawing, spawning a new number, and drawing that again in an animated fashion.

**Game end**

Failure state detection for the game is slightly tricky, to lose the user must have no more valid moves in any direction. This has proved to be slightly too complicated and time consuming to implement fully (coupled with other features and debugging). Therefore, a slightly less vigorous method is used.

Recall that the random number is spawned into a square whose address is generated by a 5-bit LFSR. A LFSR is pseudorandom and repeats its number sequence every numbers (for a n-bit LFSR). As a result, if after 31 cycles (less since we only have 16 squares) and still we could not spawn a new number, the board must be filled, and we called this our game losing condition. This condition may still be triggered even though there are moves left, and is therefore not a perfect check (relatively good enough assuming the player does not make a bad move). The current implementation checks for 100 cycles before signaling for the losing screen to be drawn.

The final states of the game draw the losing screen in the same way as the main game and awaits a signal from the enter key to reset the game.

**Report on success**

**What worked**

The project has been a huge success. A working game was produced that worked as intended and the same as the original (with the quirk of numbers being able to merge more than once per move). We successfully implemented title screens, keyboard inputs, VGA display, audio (a beep tone unique to each input), the game logic with a hardware design language, high scores and a losing screen. The game flows naturally from starting the game with enter, to playing with the arrow keys, to losing and resetting with another tap of the enter key. All photos can be found in the appendix (Appendix C)

**What didn’t work**

Throughout the entire development process there had been numerous bugs that were rather difficult to find out. Majority were fixed after spending hours looking through ModelSim simulations. However, there was a couple that have yet to be resolved.

During the testing of the game, the game RAM would sometimes be randomly wiped clean upon a move that cause numbers to merge. To find the cause of the problem would prove to be rather difficult due to the random nature of how new numbers are spawned in. The problem does not always present itself with the same set of inputs. Removing the random number portion cause the problem to go away entirely. The only way to pin point the problem would require a video capture of a game play that had the problem, then figure out a way to have the numbers spawn in the same order, and finally run it through ModelSim to be debugged. Another similar issue was that numbers occasionally “teleports” to another square upon merging in the top left square. Both issues seem to come and go with each compilation of the code, and did not happen frequently enough to be worth the time to investigate.

One possible explanation for the game RAM clear could be that since the default next state of the FSM was set to initialization, the game may have gotten itself stuck or jumped out of sequence of the states. This then led to the state to be set back to the default, causing a reset of game RAM.

**What would you do differently**

We started the project with only a basic overview of how the entire game would operate. As a result, improvisation and changing things on the fly were a continuing theme throughout the coding of the game.

One of the main things was not using ROMs for display. This meant we had to plot each pixel that would be drawn on the screen, with the exception of the title screen. We made the decision to do so at the time (at when we thought was nearing the end of the project, which in hindsight was still early) because the structure of the states was not set up for the usage of ROMs. Doing so would require a time-consuming operation to restructure the flow of the state logic, which now in hindsight would have taken much less time compared to writing literally thousands of if-else statements.

Yet another issue was due to insufficient planning. RAM was used to store the gameboard, however, we had overlooked the simple fact the it would take another clock edge after we accessed it with an address. A decent amount of debug time could have been avoided had we simply planned better and ensured that we understood each component of the game fully before coding.

**Conclusion**

This project component of the course has been beneficial in the overall understanding of how hardware design would look like. It serves both as a revision of all the other labs, and as a new learning experience of how each small component we had built before can work and communicate with one another.

References

[1] <https://gabrielecirulli.github.io/2048/>

[2] <http://www.eecg.toronto.edu/~pc/courses/241/DE1_SoC_cores/>

[3] <https://class.ee.washington.edu/271/hauck2/de1/index.html>

Appendix A: Rough timeline of project development

31 Oct

* finalized on 2048 + entered into system

6 Nov

* submitted lab 7 + set up meeting on 7 Nov
* completed planning night of 6 Nov
* preliminary FSM, modules structure layout
* game logic worked out

10 Nov

* coding began evening

11 Nov

* lab partner came over, finished draft 1, partial working game logic with partial display working (dots for debugging)

Week of 13 Nov

Issues

* game works but did not account for RAM I/O clock timing -> buggy logic
* did not have state to wait for key release -> hundreds of steps per user move input
* display math not working (due to RAM issue) -> display offset wrong
* infinite loop due to RNG not covering all spaces (which was further due to how the FSM was set up, same few numbers were read each time
* 4bit LFSR does not allow for 1111

Solutions

* added multiple signal extension states for extra time to resolve RAM I/O issue
* 1 state to wait for release of key
* updated the math equations used to generate effective X and Y coordinates
* now LFSR only enabled each time a new number is needed
* changed to 5 bit LFSR, 4 most sig bits are used

New implementations

* VGA numbers added (non ROM)
* Keyboard input added

Week of 20 Nov

Issues

* game ram auto clear when sending to the right, occurs when the right columns are full and merging occurs, possibly due to fast clicking?
* enter does not send to clear board properly if current state initialized to title screen
* cascading animation for newly spawned numbers not working

Solution

* issue occurs extremely rarely, unable to replicate for debugging, unresolved
* was no longer an issue after fixing other parts
* number iterations and if-else statements were buggy, resolved animation issues

New implementations

* sound added
* randomized color for everything on screen upon each new move, toggle-able
* auto-play feature (failed)
* game lose detection
* new title screen, losing screen, high scores

Appendix B

This section will be describing each module that is present and their purpose. For the ease of understanding, we would be separating the entire project into two big sections, the core and peripherals, described in their relevant subsections below.

**Core modules**

The core modules are the ones responsible for handling user input, game logic and output of display.

**VGA adapter module**

This is the provided VGA adaptor module from Lab 7 used to drive the display.

**Handler module**

This module acts as the bridge for communications between the control and datapath modules. Helper modules such as rate dividers and the game RAM are also instantiated at this level.

**Rate divider module**

This module generates a 120 HZ clock signal to help operate the FSM to animate the newly generated number.

**Game RAM**

This 12-bit wide, 16 word RAM contains the current state of the game. Address for each square of the board is used to access the relevant number on it, which is stored in each word in the RAM. This is a 2 port RAM, one used for the actual updating of the game, the other is connected to switches and hex displays for debugging purposes.

**Control module**

This module contains the Finite State Machine and therefore all the logic required to operate the game logic and VGA display. States are transitioned based on user input and signals from datapath module.

**Datapath module**

This module does the actual computation, updating, data input and output of the game RAM.

**Peripheral modules**

The peripheral modules are ones that adds value to the project but are not critical for the operation of the game.

**Hex display modules**

These modules are used to display the selected data from the game RAM debugging purposes.

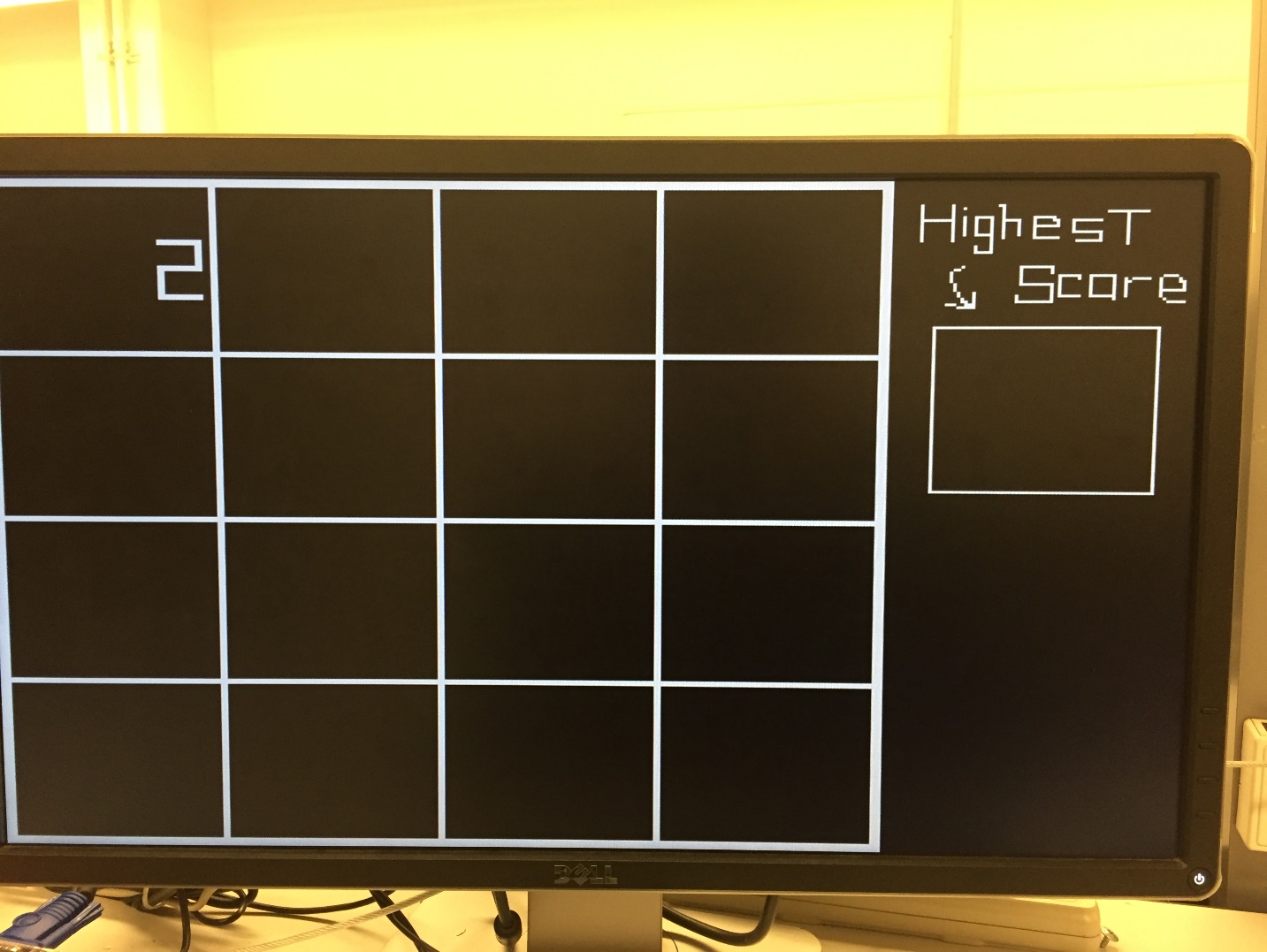
**Keyboard module**

This module decodes the inputs of PS/2 keyboard which are used to control the game [3].

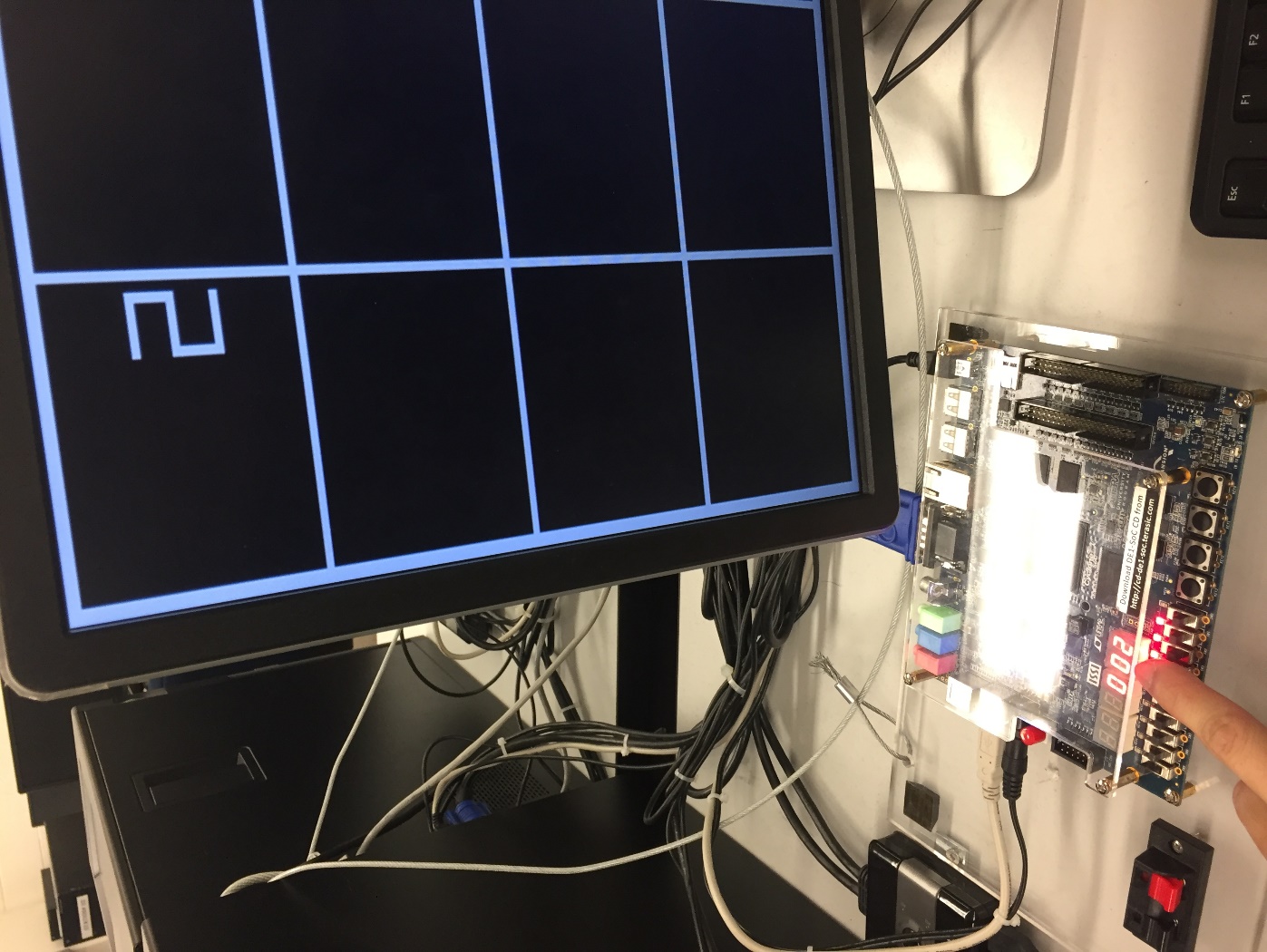
**Audio module**

This is the provided Audio module on piazza used to output sound when the user keys in an input.

Appendix C: Game photos



a. New game, waiting for user input



b. HEX displays are made to show game RAM’s data via the second port



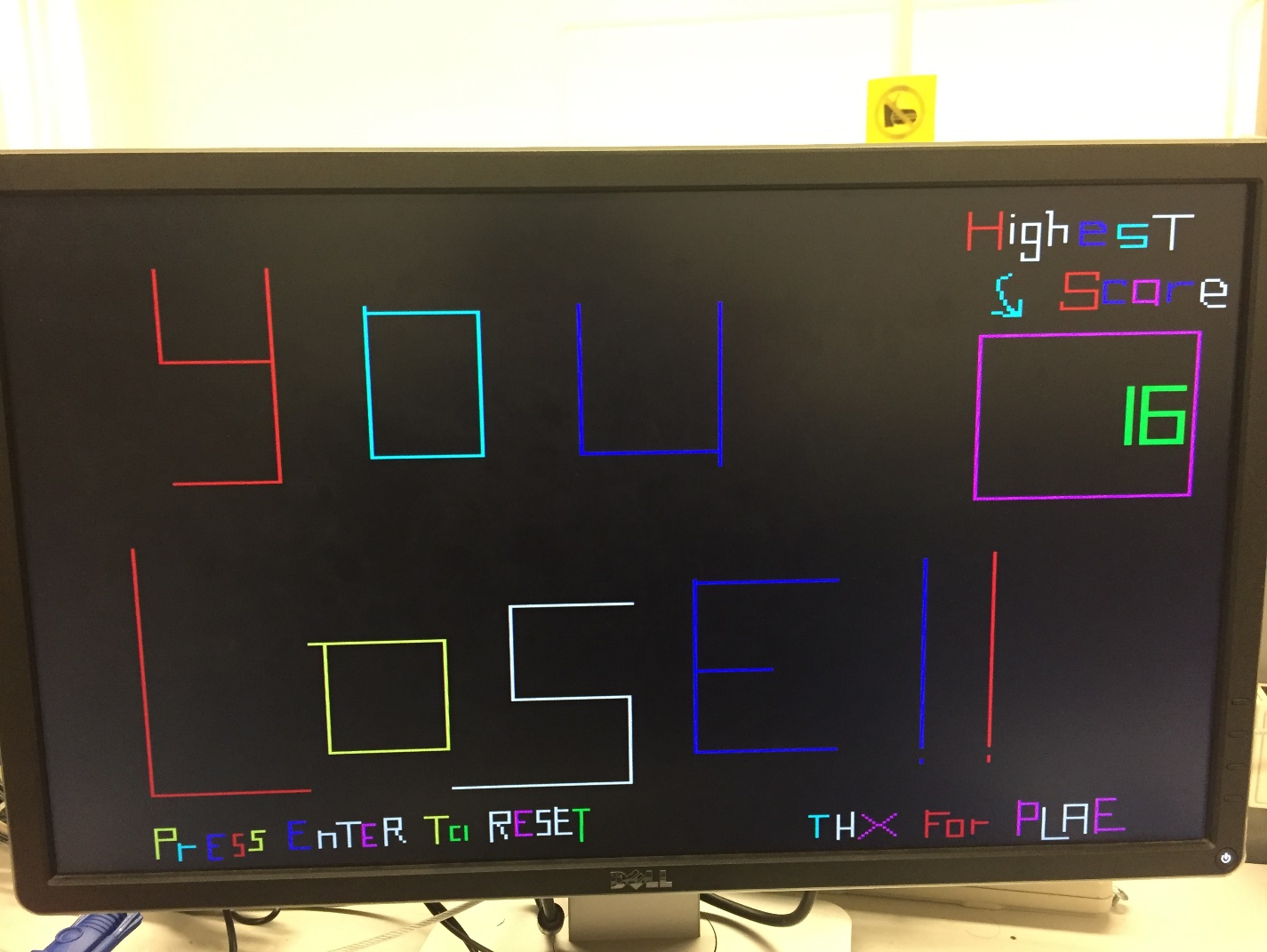
c. Game has randomized colors



d. Newly randomized colors for each move



e. No more possible moves for UP, if pressed, game treats it as a loss



f. Losing screen, each letter is a different color each time, enter key allows quick reset

Appendix D: Verilog Code

// Part 2 skeleton

module project\_2048\_game

(

CLOCK\_50, // On Board 50 MHz

// Your inputs and outputs here

// The ports below are for the VGA output. Do not change.

VGA\_CLK, // VGA Clock

VGA\_HS, // VGA H\_SYNC

VGA\_VS, // VGA V\_SYNC

VGA\_BLANK\_N, // VGA BLANK

VGA\_SYNC\_N, // VGA SYNC

VGA\_R, // VGA Red[9:0]

VGA\_G, // VGA Green[9:0]

VGA\_B, // VGA Blue[9:0]

KEY,

SW,

LEDR,

HEX0,

HEX1,

HEX2,

PS2\_DAT, // PS2 data line

PS2\_CLK, // PS2 clock line

AUD\_ADCDAT,

// Bidirectionals

AUD\_BCLK,

AUD\_ADCLRCK,

AUD\_DACLRCK,

FPGA\_I2C\_SDAT,

// Outputs

AUD\_XCK,

AUD\_DACDAT,

FPGA\_I2C\_SCLK

);

input CLOCK\_50; // 50 MHz

// Declare your inputs and outputs here

// Do not change the following outputs

output VGA\_CLK; // VGA Clock

output VGA\_HS; // VGA H\_SYNC

output VGA\_VS; // VGA V\_SYNC

output VGA\_BLANK\_N; // VGA BLANK

output VGA\_SYNC\_N; // VGA SYNC

output [9:0] VGA\_R; // VGA Red[9:0]

output [9:0] VGA\_G; // VGA Green[9:0]

output [9:0] VGA\_B; // VGA Blue[9:0]

input [3:0] KEY;

input [9:0] SW;

output [9:0] LEDR;

output [6:0] HEX0;

output [6:0] HEX1;

output [6:0] HEX2;

input PS2\_DAT; // PS2 data line

input PS2\_CLK; // PS2 clock line

input AUD\_ADCDAT;

// Bidirectionals

inout AUD\_BCLK;

inout AUD\_ADCLRCK;

inout AUD\_DACLRCK;

inout FPGA\_I2C\_SDAT;

// Outputs

output AUD\_XCK;

output AUD\_DACDAT;

output FPGA\_I2C\_SCLK;

// Internal Wires

wire audio\_in\_available;

wire [31:0] left\_channel\_audio\_in;

wire [31:0] right\_channel\_audio\_in;

wire read\_audio\_in;

wire audio\_out\_allowed;

wire [31:0] left\_channel\_audio\_out;

wire [31:0] right\_channel\_audio\_out;

wire write\_audio\_out;

// Internal Registers

reg [18:0] delay\_cnt;

wire [18:0] delay;

reg snd;

wire [11:0] gameRAM\_DataOut\_Display;

// Create the colour, x, y and writeEn wires that are inputs to the controller.

wire [2:0] colour;

wire [8:0] x;

wire [7:0] y;

wire writeEn;

wire [3:0] sig\_move;

wire resetn;

wire enter;

wire colourful;

// Create an Instance of a VGA controller - there can be only one!

// Define the number of colours as well as the initial background

// image file (.MIF) for the controller.

vga\_adapter VGA(

.resetn(resetn),

.clock(CLOCK\_50),

.colour(colour),

.x(x),

.y(y),

.plot(writeEn),

/\* Signals for the DAC to drive the monitor. \*/

.VGA\_R(VGA\_R),

.VGA\_G(VGA\_G),

.VGA\_B(VGA\_B),

.VGA\_HS(VGA\_HS),

.VGA\_VS(VGA\_VS),

.VGA\_BLANK(VGA\_BLANK\_N),

.VGA\_SYNC(VGA\_SYNC\_N),

.VGA\_CLK(VGA\_CLK));

defparam VGA.RESOLUTION = "320x240";

defparam VGA.MONOCHROME = "FALSE";

defparam VGA.BITS\_PER\_COLOUR\_CHANNEL = 1;

defparam VGA.BACKGROUND\_IMAGE = "titlescreen.mif";

// Put your code here. Your code should produce signals x,y,colour and writeEn

// for the VGA controller, in addition to any other functionality your design may require.

wire dummy\_valid;

wire dummy\_makeBreak;

wire [7:0] dummy\_outCode;

wire [3:0] keyboard\_sig\_move;

wire keyboard\_reset;

wire keyboard\_enter;

keyboard\_press\_driver u0(

.CLOCK\_50(CLOCK\_50),

.valid(dummy\_valid),

.makeBreak(dummy\_makeBreak),

.outCode(dummy\_outCode),

.KEYBOARD\_RESET(keyboard\_reset),

.KEYBOARD\_ENTER(keyboard\_enter),

.sig\_move(keyboard\_sig\_move),///////////////////////////////////////////////////

.PS2\_DAT(PS2\_DAT),

.PS2\_CLK(PS2\_CLK),

.reset(~resetn)

);

wire [4:0] randMove;

wire CLOCK\_120HZ;

RateDivider\_120HZ rd\_120\_1(

.CLOCK\_50(CLOCK\_50),

.resetn(resetn),

.CLOCK\_120HZ(CLOCK\_120HZ)

);

Linear\_FB\_Shift\_Reg\_5b randMoveGen(

.CLOCK\_50(CLOCK\_50),

.resetn(resetn),

.LFBSR\_enable(CLOCK\_120HZ),

.out(randMove)

);

reg up;

reg down;

reg left;

reg right;

always @ (\*) begin

up = 1'b0;

down = 1'b0;

left = 1'b0;

right = 1'b0;

case (randMove[4:1])

4'b0000:

up = 1'b1 & CLOCK\_120HZ;

4'b0001:

up = 1'b1 & CLOCK\_120HZ;

4'b0010:

up = 1'b1 & CLOCK\_120HZ;

4'b0011:

up = 1'b1 & CLOCK\_120HZ;

4'b0100:

down = 1'b1 & CLOCK\_120HZ;

4'b0101:

down = 1'b1 & CLOCK\_120HZ;

4'b0110:

down = 1'b1 & CLOCK\_120HZ;

4'b0111:

down = 1'b1 & CLOCK\_120HZ;

4'b1000:

left = 1'b1 & CLOCK\_120HZ;

4'b1001:

left = 1'b1 & CLOCK\_120HZ;

4'b1010:

left = 1'b1 & CLOCK\_120HZ;

4'b1011:

left = 1'b1 & CLOCK\_120HZ;

4'b1100:

right = 1'b1 & CLOCK\_120HZ;

4'b1101:

right = 1'b1 & CLOCK\_120HZ;

4'b1110:

right = 1'b1 & CLOCK\_120HZ;

4'b1111:

right = 1'b1 & CLOCK\_120HZ;

endcase

end

// Controls for 2048

// KEY[3] Left

// KEY[2] Up

// KEY[1] Down

// KEY[0] Right

assign sig\_move = SW[6] ? {left, up, down, right} : ({~KEY[3], ~KEY[2], ~KEY[1], ~KEY[0]} | keyboard\_sig\_move);

assign resetn = ((SW[9]) | (keyboard\_reset));

assign enter = ((SW[8]) | (keyboard\_enter));

assign colourful = SW[7];

handler handler0(

.CLOCK\_50(CLOCK\_50),

.resetn(resetn),

.sig\_move(sig\_move),

.enter(enter),

.gameRAM\_Addr\_Display(SW[3:0]),

.gameRAM\_DataOut\_Display(gameRAM\_DataOut\_Display),

.stateLEDs(LEDR),

.x(x),

.y(y),

.colour(colour),

.writeEn(writeEn),

.colourful(colourful)

);

hex\_decoder h0(

.hex\_digit(gameRAM\_DataOut\_Display[3:0]),

.segments(HEX0)

);

hex\_decoder h1(

.hex\_digit(gameRAM\_DataOut\_Display[7:4]),

.segments(HEX1)

);

hex\_decoder h2(

.hex\_digit(gameRAM\_DataOut\_Display[11:8]),

.segments(HEX2)

);

always @(posedge CLOCK\_50)

if(delay\_cnt == delay) begin

delay\_cnt <= 0;

snd <= !snd;

end else delay\_cnt <= delay\_cnt + 1;

assign delay = {sig\_move, 15'd3000};

wire [31:0] sound = (SW == 0) ? 0 : snd ? 32'd10000000 : -32'd10000000;

assign read\_audio\_in = audio\_in\_available & audio\_out\_allowed;

assign left\_channel\_audio\_out = left\_channel\_audio\_in+sound;

assign right\_channel\_audio\_out = right\_channel\_audio\_in+sound;

assign write\_audio\_out = audio\_in\_available & audio\_out\_allowed;

Audio\_Controller Audio\_Controller (

// Inputs

.CLOCK\_50 (CLOCK\_50),

.reset (~resetn),

.clear\_audio\_in\_memory (),

.read\_audio\_in (read\_audio\_in),

.clear\_audio\_out\_memory (),

.left\_channel\_audio\_out (left\_channel\_audio\_out),

.right\_channel\_audio\_out (right\_channel\_audio\_out),

.write\_audio\_out (write\_audio\_out),

.AUD\_ADCDAT (AUD\_ADCDAT),

// Bidirectionals

.AUD\_BCLK (AUD\_BCLK),

.AUD\_ADCLRCK (AUD\_ADCLRCK),

.AUD\_DACLRCK (AUD\_DACLRCK),

// Outputs

.audio\_in\_available (audio\_in\_available),

.left\_channel\_audio\_in (left\_channel\_audio\_in),

.right\_channel\_audio\_in (right\_channel\_audio\_in),

.audio\_out\_allowed (audio\_out\_allowed),

.AUD\_XCK (AUD\_XCK),

.AUD\_DACDAT (AUD\_DACDAT)

);

avconf #(.USE\_MIC\_INPUT(1)) avc (

.FPGA\_I2C\_SCLK (FPGA\_I2C\_SCLK),

.FPGA\_I2C\_SDAT (FPGA\_I2C\_SDAT),

.CLOCK\_50 (CLOCK\_50),

.reset (~resetn)

);

endmodule

module handler(

input CLOCK\_50,

input resetn,

input [3:0] sig\_move,

input enter,

input [3:0] gameRAM\_Addr\_Display,

output [11:0] gameRAM\_DataOut\_Display,

output [9:0] stateLEDs,

output [8:0] x,

output [7:0] y,

output [2:0] colour,

output writeEn,

input colourful

);

wire CLOCK\_60HZ;

RateDivider\_60HZ rd\_60(

.CLOCK\_50(CLOCK\_50),

.resetn(resetn),

.CLOCK\_60HZ(CLOCK\_60HZ)

);

wire CLOCK\_120HZ;

RateDivider\_120HZ rd\_30(

.CLOCK\_50(CLOCK\_50),

.resetn(resetn),

.CLOCK\_120HZ(CLOCK\_120HZ)

);

wire [11:0] gameRAM\_DataIn;

wire [11:0] gameRAM\_DataOut;

wire [3:0] gameRAM\_Addr;

wire gameRAM\_writeEn;

wire [11:0] gameRAM\_DataIn\_Dummy;

wire gameRAM\_writeEn\_Dummy;

assign gameRAM\_DataIn\_Dummy = 12'b0;

assign gameRAM\_writeEn\_Dummy = 1'b0;

GameRAM2port gameBoard(

.clock(CLOCK\_50),

.data\_a(gameRAM\_DataIn),

.address\_a(gameRAM\_Addr),

.wren\_a(gameRAM\_writeEn),

.q\_a(gameRAM\_DataOut),

.data\_b(gameRAM\_DataIn\_Dummy),

.address\_b(gameRAM\_Addr\_Display),

.wren\_b(gameRAM\_writeEn\_Dummy),

.q\_b(gameRAM\_DataOut\_Display)

);

wire sig\_clearBoard\_DONE;

wire sig\_randNum\_GOOD;

wire sig\_drawBoard\_DONE;

wire sig\_doneProcess;

wire sig\_toNoMove;

wire sig\_toMergeMove;

wire sig\_toJustMove;

wire sig\_nextIteration;

wire sig\_clearBoard;

wire sig\_checkRandNum;

wire sig\_spawnNumOnBoard;

wire sig\_drawBoard;

wire sig\_initDraw;

wire sig\_gameDraw;

wire sig\_gameEndDraw;

wire sig\_resetIteration;

wire sig\_iterationCheck;

wire sig\_setCurrentPOS;

wire sig\_setCurrentNextPOS;

wire sig\_checkBound;

wire sig\_calcMove;

wire sig\_noMove;

wire sig\_mergeUpdateNext;

wire sig\_mergeUpdateCur;

wire sig\_noMergeUpdateNext;

wire sig\_noMergeUpdateCur;

wire sig\_iterationIncre;

wire ld\_randomNum;

wire ld\_move;

wire ld\_iterationCounter;

wire ld\_gameBoard\_cur\_X;

wire ld\_gameBoard\_cur\_Y;

wire ld\_gameBoard\_cur\_Value;

wire ld\_gameBoard\_next\_X;

wire ld\_gameBoard\_next\_Y;

////////////////////////////////////////////////////////////////////////////////////////////////////////////////

wire [1:0] cur\_X;

wire [1:0] next\_X;

wire [1:0] cur\_Y;

wire [1:0] next\_Y;

wire [1:0] temp\_X;

wire [1:0] temp\_Y;

wire [11:0] cur\_Value;

wire sig\_debug\_displayBoard\_DONE, sig\_debug\_displayBoard;

wire sig\_ldExt;

wire sig\_drawBoard\_init;

wire sig\_drawBoard\_CounterCheck;

wire sig\_getCur\_XY;

wire sig\_drawBoard\_CounterEn;

wire sig\_drawBoard\_Cont;

wire [5:0] effective\_X;

wire [5:0] effective\_Y;

wire [3:0] randomNum\_reg;

wire [4:0] randomNum;

wire LFBSR\_enable;

wire sig\_cascCounter\_init;

wire ld\_cascCounter;

wire sig\_casc\_CounterCheck;

wire sig\_pixelCounter\_init;

wire sig\_pixel\_CounterEn;

wire sig\_drawRandNum;

wire sel\_randNum\_XY;

wire sel\_randNum\_Colour;

wire sig\_cascCounter\_Incre;

wire sig\_doneCasc;

wire sig\_randNumDraw\_DONE;

wire [6:0] casc\_Counter, temp\_casc\_Counter;

wire [5:0] rand\_eff\_X;

wire [5:0] rand\_eff\_Y;

wire sig\_getHighscore;

wire ld\_highscore;

wire sig\_gameLose;

wire sig\_drawEnd;

control control0(

// Standard I/O

.CLOCK\_50(CLOCK\_50),

.resetn(resetn),

// Game control inputs

.sig\_move(sig\_move),

.enter(enter),

// State LEDs for debugging

.stateLEDs(stateLEDs),

// Signals from datapath

.sig\_clearBoard\_DONE(sig\_clearBoard\_DONE),

.sig\_randNum\_GOOD(sig\_randNum\_GOOD),

.sig\_drawBoard\_DONE(sig\_drawBoard\_DONE),

.sig\_doneProcess(sig\_doneProcess),

.sig\_toNoMove(sig\_toNoMove),

.sig\_toMergeMove(sig\_toMergeMove),

.sig\_toJustMove(sig\_toJustMove),

.sig\_nextIteration(sig\_nextIteration),

.sig\_debug\_displayBoard\_DONE(sig\_debug\_displayBoard\_DONE),////////////////////////////////////////////////////

.sig\_drawBoard\_Cont(sig\_drawBoard\_Cont),

// Signals to datapath

.sig\_clearBoard(sig\_clearBoard),

.sig\_checkRandNum(sig\_checkRandNum),

.sig\_spawnNumOnBoard(sig\_spawnNumOnBoard),

.sig\_drawBoard(sig\_drawBoard),

.sig\_drawBoard\_init(sig\_drawBoard\_init),//////////////////////////

.sig\_initDraw(sig\_initDraw),

.sig\_gameDraw(sig\_gameDraw),

.sig\_gameEndDraw(sig\_gameEndDraw),

.sig\_resetIteration(sig\_resetIteration),

.sig\_iterationCheck(sig\_iterationCheck),

.sig\_setCurrentPOS(sig\_setCurrentPOS),

.sig\_setCurrentNextPOS(sig\_setCurrentNextPOS),

.sig\_checkBound(sig\_checkBound),

.sig\_calcMove(sig\_calcMove),

.sig\_noMove(sig\_noMove),

.sig\_ldExt(sig\_ldExt), ////////////////////////////////////////////////////////////

.sig\_mergeUpdateNext(sig\_mergeUpdateNext),

.sig\_mergeUpdateCur(sig\_mergeUpdateCur),

.sig\_noMergeUpdateNext(sig\_noMergeUpdateNext),

.sig\_noMergeUpdateCur(sig\_noMergeUpdateCur),

.sig\_iterationIncre(sig\_iterationIncre),

.sig\_debug\_displayBoard(sig\_debug\_displayBoard),///////////////////////////////////////////////////////////////////////

.sig\_drawBoard\_CounterCheck(sig\_drawBoard\_CounterCheck),

.sig\_getCur\_XY(sig\_getCur\_XY),

.sig\_drawBoard\_CounterEn(sig\_drawBoard\_CounterEn),

.gameRAM\_writeEn(gameRAM\_writeEn),

.ld\_randomNum(ld\_randomNum),

.ld\_move(ld\_move),

.ld\_iterationCounter(ld\_iterationCounter),

.ld\_gameBoard\_cur\_X(ld\_gameBoard\_cur\_X),

.ld\_gameBoard\_cur\_Y(ld\_gameBoard\_cur\_Y),

.ld\_gameBoard\_cur\_Value(ld\_gameBoard\_cur\_Value),

.ld\_gameBoard\_next\_X(ld\_gameBoard\_next\_X),

.ld\_gameBoard\_next\_Y(ld\_gameBoard\_next\_Y),

.writeEn(writeEn),

.LFBSR\_enable(LFBSR\_enable),

.sig\_cascCounter\_init(sig\_cascCounter\_init),

.ld\_cascCounter(ld\_cascCounter),

.sig\_casc\_CounterCheck(sig\_casc\_CounterCheck),

.sig\_pixelCounter\_init(sig\_pixelCounter\_init),

.sig\_pixel\_CounterEn(sig\_pixel\_CounterEn),

.sig\_drawRandNum(sig\_drawRandNum),

.sel\_randNum\_XY(sel\_randNum\_XY),

.sel\_randNum\_Colour(sel\_randNum\_Colour),

.sig\_cascCounter\_Incre(sig\_cascCounter\_Incre),

.sig\_doneCasc(sig\_doneCasc),

.sig\_randNumDraw\_DONE(sig\_randNumDraw\_DONE),

.CLOCK\_60HZ(CLOCK\_60HZ),

.sig\_getHighscore(sig\_getHighscore),

.ld\_highscore(ld\_highscore),

.sig\_gameLose(sig\_gameLose),

.sig\_drawEnd(sig\_drawEnd),

.CLOCK\_120HZ(CLOCK\_120HZ)

);

datapath datapath0(

// Standard I/O

.CLOCK\_50(CLOCK\_50),

.resetn(resetn),

.sig\_move(sig\_move),

// Signals from control

.sig\_clearBoard(sig\_clearBoard),

.sig\_checkRandNum(sig\_checkRandNum),

.sig\_spawnNumOnBoard(sig\_spawnNumOnBoard),

.sig\_drawBoard(sig\_drawBoard),

.sig\_drawBoard\_init(sig\_drawBoard\_init),///////////////////////

.sig\_initDraw(sig\_initDraw),

.sig\_gameDraw(sig\_gameDraw),

.sig\_gameEndDraw(sig\_gameEndDraw),

.sig\_resetIteration(sig\_resetIteration),

.sig\_iterationCheck(sig\_iterationCheck),

.sig\_setCurrentPOS(sig\_setCurrentPOS),

.sig\_setCurrentNextPOS(sig\_setCurrentNextPOS),

.sig\_checkBound(sig\_checkBound),

.sig\_calcMove(sig\_calcMove),

.sig\_noMove(sig\_noMove),

.sig\_ldExt(sig\_ldExt), //////////////////////////////////////////////

.sig\_mergeUpdateNext(sig\_mergeUpdateNext),

.sig\_mergeUpdateCur(sig\_mergeUpdateCur),

.sig\_noMergeUpdateNext(sig\_noMergeUpdateNext),

.sig\_noMergeUpdateCur(sig\_noMergeUpdateCur),

.sig\_iterationIncre(sig\_iterationIncre),

.sig\_debug\_displayBoard(sig\_debug\_displayBoard),///////////////////////////////////////////////////////////////////////

.sig\_drawBoard\_CounterCheck(sig\_drawBoard\_CounterCheck),

.sig\_getCur\_XY(sig\_getCur\_XY),

.sig\_drawBoard\_CounterEn(sig\_drawBoard\_CounterEn),

.gameRAM\_writeEn(gameRAM\_writeEn),

.ld\_randomNum(ld\_randomNum),

.ld\_move(ld\_move),

.ld\_iterationCounter(ld\_iterationCounter),

.ld\_gameBoard\_cur\_X(ld\_gameBoard\_cur\_X),

.ld\_gameBoard\_cur\_Y(ld\_gameBoard\_cur\_Y),

.ld\_gameBoard\_cur\_Value(ld\_gameBoard\_cur\_Value),

.ld\_gameBoard\_next\_X(ld\_gameBoard\_next\_X),

.ld\_gameBoard\_next\_Y(ld\_gameBoard\_next\_Y),

.LFBSR\_enable(LFBSR\_enable),

// Signals to control

.sig\_clearBoard\_DONE(sig\_clearBoard\_DONE),

.sig\_randNum\_GOOD(sig\_randNum\_GOOD),

.sig\_drawBoard\_DONE(sig\_drawBoard\_DONE),

.sig\_doneProcess(sig\_doneProcess),

.sig\_toNoMove(sig\_toNoMove),

.sig\_toMergeMove(sig\_toMergeMove),

.sig\_toJustMove(sig\_toJustMove),

.sig\_nextIteration(sig\_nextIteration),

.sig\_debug\_displayBoard\_DONE(sig\_debug\_displayBoard\_DONE),////////////////////////////////////////////////////

.sig\_drawBoard\_Cont(sig\_drawBoard\_Cont),

// Game RAM I/O

.gameRAM\_DataOut(gameRAM\_DataOut),

.gameRAM\_DataIn(gameRAM\_DataIn),

.gameRAM\_Addr(gameRAM\_Addr),

// VGA output

.x(x),

.y(y),

.colour(colour),

.effective\_X(effective\_X),

.effective\_Y(effective\_Y),

.rand\_eff\_X(rand\_eff\_X),

.rand\_eff\_Y(rand\_eff\_Y),

////////////////////////////////////////////////////////////////////////////////////////////////////////////////

.gameBoard\_cur\_X(cur\_X),

.gameBoard\_next\_X(next\_X),

.gameBoard\_cur\_Y(cur\_Y),

.gameBoard\_next\_Y(next\_Y),

.gameBoard\_cur\_Value(cur\_Value),

.temp\_X(temp\_X),

.temp\_Y(temp\_Y),

.casc\_Counter(casc\_Counter),

.temp\_casc\_Counter(temp\_casc\_Counter),

.randomNum\_reg(randomNum\_reg),

.randomNum(randomNum),

.sig\_cascCounter\_init(sig\_cascCounter\_init),

.ld\_cascCounter(ld\_cascCounter),

.sig\_casc\_CounterCheck(sig\_casc\_CounterCheck),

.sig\_pixelCounter\_init(sig\_pixelCounter\_init),

.sig\_pixel\_CounterEn(sig\_pixel\_CounterEn),

.sig\_drawRandNum(sig\_drawRandNum),

.sel\_randNum\_XY(sel\_randNum\_XY),

.sel\_randNum\_Colour(sel\_randNum\_Colour),

.sig\_cascCounter\_Incre(sig\_cascCounter\_Incre),

.sig\_doneCasc(sig\_doneCasc),

.sig\_randNumDraw\_DONE(sig\_randNumDraw\_DONE),

.sig\_getHighscore(sig\_getHighscore),

.ld\_highscore(ld\_highscore),

.sig\_gameLose(sig\_gameLose),

.sig\_drawEnd(sig\_drawEnd),

.colourful(colourful)

);

endmodule

module RateDivider\_60HZ(CLOCK\_50, resetn, CLOCK\_60HZ);

input CLOCK\_50, resetn;

output CLOCK\_60HZ;

reg CLOCK\_60HZ;

reg [21:0] counter;

always @(posedge CLOCK\_50, negedge resetn) begin

if (!resetn) begin

counter <= 22'd0;

CLOCK\_60HZ <= 1'b0;

end

else begin

counter <= (counter == 22'd2499999) ? 22'd0 : counter + 1'b1;

CLOCK\_60HZ <= (counter == 22'd833333) | (counter == 22'd1666666) | (counter == 22'd2499999);

end

end

endmodule

module RateDivider\_120HZ(CLOCK\_50, resetn, CLOCK\_120HZ);

input CLOCK\_50, resetn;

output CLOCK\_120HZ;

reg CLOCK\_120HZ;

reg [20:0] counter;

always @(posedge CLOCK\_50, negedge resetn) begin

if (!resetn) begin

counter <= 21'd0;

CLOCK\_120HZ <= 1'b0;

end

else begin

counter <= (counter == 21'd1249999) ? 21'd0 : counter + 1'b1;

CLOCK\_120HZ <= (counter == 21'd416666) | (counter == 21'd833333) | (counter == 21'd1249999);

end

end

endmodule

module control(

// Standard I/O

input CLOCK\_50,

input resetn,

// Game control inputs

input [3:0] sig\_move,

input enter,

// State LEDs for debugging

output [9:0] stateLEDs,

// Signals from datapath

input sig\_clearBoard\_DONE,

input sig\_randNum\_GOOD,

input sig\_drawBoard\_DONE,

input sig\_doneProcess,

input sig\_toNoMove,

input sig\_toMergeMove,

input sig\_toJustMove,

input sig\_nextIteration,

input sig\_debug\_displayBoard\_DONE, ////////////////////////////////////////////////////////////////////

input sig\_drawBoard\_Cont,

// Signals to datapath

output reg sig\_clearBoard,

output reg sig\_checkRandNum,

output reg sig\_spawnNumOnBoard,

output reg sig\_drawBoard,

output reg sig\_drawBoard\_init,///////////////////////////////////////

output reg sig\_initDraw,

output reg sig\_gameDraw,

output reg sig\_gameEndDraw,

output reg sig\_resetIteration,

output reg sig\_iterationCheck,

output reg sig\_setCurrentPOS,

output reg sig\_setCurrentNextPOS,

output reg sig\_checkBound,

output reg sig\_calcMove,

output reg sig\_noMove,

output reg sig\_ldExt, /////////////////////////////////////////////////////////

output reg sig\_mergeUpdateNext,

output reg sig\_mergeUpdateCur,

output reg sig\_noMergeUpdateNext,

output reg sig\_noMergeUpdateCur,

output reg sig\_iterationIncre,

output reg sig\_debug\_displayBoard, ///////////////////////////////////////////////////////////////////

output reg sig\_drawBoard\_CounterCheck,

output reg sig\_getCur\_XY,

output reg sig\_drawBoard\_CounterEn,

output reg gameRAM\_writeEn,

output reg ld\_randomNum,

output reg ld\_move,

output reg ld\_iterationCounter,

output reg ld\_gameBoard\_cur\_X,

output reg ld\_gameBoard\_cur\_Y,

output reg ld\_gameBoard\_cur\_Value,

output reg ld\_gameBoard\_next\_X,

output reg ld\_gameBoard\_next\_Y,

output reg LFBSR\_enable,

output reg writeEn,

input sig\_doneCasc,

input sig\_randNumDraw\_DONE,

input CLOCK\_60HZ,

output reg sig\_cascCounter\_init,

output reg ld\_cascCounter,

output reg sig\_casc\_CounterCheck,

output reg sig\_pixelCounter\_init,

output reg sig\_pixel\_CounterEn,

output reg sig\_drawRandNum,

output reg sel\_randNum\_XY,

output reg sel\_randNum\_Colour,

output reg sig\_cascCounter\_Incre,

output reg sig\_getHighscore,

output reg ld\_highscore,

input sig\_gameLose,

output reg sig\_drawEnd,

input CLOCK\_120HZ

);

reg [6:0] current\_state, next\_state;

localparam TITLE\_SCREEN = 7'd1,

TITLE\_SCREEN\_WAIT = 7'd2,

INIT\_CLEAR\_BOARD = 7'd3,

INIT\_RAND\_NUM = 7'd4,

INIT\_CHECK\_NUM = 7'd5,

INIT\_SPAWN\_NUM = 7'd6,

INIT\_DRAW\_INIT = 7'd7,///////////////////

INIT\_DRAW\_COUNTER\_CHECK = 7'd8,

INIT\_DRAW\_LD\_XY = 7'd9,

INIT\_DRAW\_LD\_VAL = 7'd10,

INIT\_DRAW\_LD\_VAL\_2 = 7'd11,

INIT\_DRAW = 7'd12,

INIT\_DRAW\_COUNTER\_INCRE = 7'd13,

GAME\_WAIT\_FOR\_MOVE = 7'd14,

GAME\_STORE\_MOVE = 7'd15,

GAME\_STORE\_MOVE\_WAIT = 7'd16,

GAME\_PROCESS\_MOVE\_INIT = 7'd17,

GAME\_PROCESS\_ITER\_CHECK = 7'd18,

GAME\_PROCESS\_SET\_POS = 7'd19,

GAME\_SET\_POS\_WAIT = 7'd20,

GAME\_SET\_POS\_WAIT\_2 = 7'd21,

GAME\_PROCESS\_WITHIN\_BOUND = 7'd22,

GAME\_PROCESS\_SET\_NEXT\_POS = 7'd23,

GAME\_PROCESS\_CALC\_PRE = 7'd24,

GAME\_PROCESS\_CALC = 7'd25,

GAME\_PROCESS\_NO\_MOVE = 7'd26,

NO\_MOVE\_LD\_EXT = 7'd27,

NO\_MOVE\_LD\_EXT\_2 = 7'd28,

GAME\_PROCESS\_MERGE\_MOVE\_UPDATE\_NEXT = 7'd29,

GAME\_PROCESS\_MERGE\_MOVE\_UPDATE\_NEXT\_EXT= 7'd30,

GAME\_PROCESS\_MERGE\_MOVE\_UPDATE\_CUR = 7'd31,

GAME\_PROCESS\_MERGE\_MOVE\_UPDATE\_CUR\_EXT = 7'd32,

GAME\_PROCESS\_JUST\_MOVE\_UPDATE\_NEXT = 7'd33,

GAME\_PROCESS\_JUST\_MOVE\_UPDATE\_NEXT\_EXT = 7'd34,

GAME\_PROCESS\_JUST\_MOVE\_UPDATE\_CUR = 7'd35,

GAME\_PROCESS\_JUST\_MOVE\_UPDATE\_CUR\_EXT = 7'd36,

GAME\_PROCESS\_ITER\_INCRE = 7'd37,

GAME\_RAND\_NUM = 7'd38,

GAME\_CHECK\_NUM = 7'd39,

GAME\_CHECK\_NUM\_WAIT = 7'd40,

GAME\_SPAWN\_NUM = 7'd41,

GAME\_DRAW\_INIT = 7'd42,

GAME\_DRAW\_COUNTER\_CHECK = 7'd43,

GAME\_DRAW\_LD\_XY = 7'd44,

GAME\_DRAW\_LD\_VAL = 7'd45,

GAME\_DRAW\_LD\_VAL\_2 = 7'd46,

GAME\_DRAW = 7'd47,

GAME\_DRAW\_COUNTER\_INCRE = 7'd48,

DEBUG\_DISPLAY\_BOARD = 7'd49, ///////////////////////////////////////////////////////

DEBUG\_DISPLAY\_BOARD\_2 = 7'd50, ///////////////////////////////////////////////////////

CASC\_COUNTER\_INIT = 7'd51,

CASC\_COUNTER\_CHECK = 7'd52,

PIXEL\_COUNTER\_INIT = 7'd53,

RAND\_NUM\_DRAW = 7'd54,

INCRE\_CASC\_COUNTER = 7'd55,

GAME\_CASC\_COUNTER\_INIT = 7'd56,

GAME\_CASC\_COUNTER\_CHECK = 7'd57,

GAME\_PIXEL\_COUNTER\_INIT = 7'd58,

GAME\_RAND\_NUM\_DRAW = 7'd59,

GAME\_INCRE\_CASC\_COUNTER = 7'd60,

GAME\_END\_DRAW\_INIT = 7'd61,

GAME\_END\_DRAW\_COUNTER\_CHECK = 7'd62,

GAME\_END\_DRAW = 7'd63,

GAME\_END\_DRAW\_COUNTER\_INCRE = 7'd64,

GAME\_END = 7'd65;

initial begin

current\_state = TITLE\_SCREEN;

sig\_clearBoard = 1'b0;

sig\_checkRandNum = 1'b0;

sig\_spawnNumOnBoard = 1'b0;

sig\_drawBoard = 1'b0;

sig\_drawBoard\_init = 1'b0;

sig\_initDraw = 1'b0;

sig\_gameDraw = 1'b0;

sig\_gameEndDraw = 1'b0;

sig\_resetIteration = 1'b0;

sig\_iterationCheck = 1'b0;

sig\_setCurrentPOS = 1'b0;

sig\_setCurrentNextPOS = 1'b0;

sig\_checkBound = 1'b0;

sig\_calcMove = 1'b0;

sig\_noMove = 1'b0;

sig\_ldExt = 1'b0;//////////////////////////////////

sig\_mergeUpdateNext = 1'b0;

sig\_mergeUpdateCur = 1'b0;

sig\_noMergeUpdateNext = 1'b0;

sig\_noMergeUpdateCur = 1'b0;

sig\_iterationIncre = 1'b0;

sig\_debug\_displayBoard = 1'b0;//////////////////////////////////////

sig\_drawBoard\_CounterCheck = 1'b0;

sig\_getCur\_XY = 1'b0;

sig\_drawBoard\_CounterEn = 1'b0;

sig\_cascCounter\_init = 1'b0;

ld\_cascCounter = 1'b0;

sig\_casc\_CounterCheck = 1'b0;

sig\_pixelCounter\_init = 1'b0;

sig\_pixel\_CounterEn = 1'b0;

sig\_drawRandNum = 1'b0;

sel\_randNum\_XY = 1'b0;

sel\_randNum\_Colour = 1'b0;

sig\_cascCounter\_Incre = 1'b0;

gameRAM\_writeEn = 1'b0;

ld\_randomNum = 1'b0;

ld\_move = 1'b0;

ld\_iterationCounter = 1'b0;

ld\_gameBoard\_cur\_X = 1'b0;

ld\_gameBoard\_cur\_Y = 1'b0;

ld\_gameBoard\_cur\_Value = 1'b0;

ld\_gameBoard\_next\_X = 1'b0;

ld\_gameBoard\_next\_Y = 1'b0;

LFBSR\_enable = 1'b0;

writeEn = 1'b0;

sig\_getHighscore = 1'b0;

ld\_highscore = 1'b0;

sig\_drawEnd = 1'b0;

end

// State Table

always@(\*)

begin:state\_table

case (current\_state)

// Title screen

TITLE\_SCREEN: next\_state = enter ? TITLE\_SCREEN\_WAIT : TITLE\_SCREEN;

TITLE\_SCREEN\_WAIT: next\_state = ~enter ? INIT\_CLEAR\_BOARD : TITLE\_SCREEN\_WAIT;

// Empties board

INIT\_CLEAR\_BOARD: next\_state = sig\_clearBoard\_DONE ? INIT\_DRAW\_INIT : INIT\_CLEAR\_BOARD;

// Draws

INIT\_DRAW\_INIT: next\_state = INIT\_DRAW\_COUNTER\_CHECK;

INIT\_DRAW\_COUNTER\_CHECK: next\_state = sig\_drawBoard\_Cont ? INIT\_DRAW\_LD\_XY : INIT\_RAND\_NUM;

INIT\_DRAW\_LD\_XY: next\_state = INIT\_DRAW\_LD\_VAL;

INIT\_DRAW\_LD\_VAL: next\_state = INIT\_DRAW\_LD\_VAL\_2;

INIT\_DRAW\_LD\_VAL\_2: next\_state = INIT\_DRAW;

INIT\_DRAW: next\_state = INIT\_DRAW\_COUNTER\_INCRE;

INIT\_DRAW\_COUNTER\_INCRE: next\_state = INIT\_DRAW\_COUNTER\_CHECK;

// Spawns starting number

INIT\_RAND\_NUM: next\_state = INIT\_CHECK\_NUM;

INIT\_CHECK\_NUM: next\_state = sig\_randNum\_GOOD ? INIT\_SPAWN\_NUM : INIT\_RAND\_NUM;//////////////////////sig\_randNum\_GOOD

INIT\_SPAWN\_NUM: next\_state = CASC\_COUNTER\_INIT;

// Draws random number

CASC\_COUNTER\_INIT: next\_state = CASC\_COUNTER\_CHECK;

CASC\_COUNTER\_CHECK: next\_state = sig\_doneCasc ? GAME\_WAIT\_FOR\_MOVE : PIXEL\_COUNTER\_INIT;

PIXEL\_COUNTER\_INIT: next\_state = CLOCK\_120HZ ? RAND\_NUM\_DRAW : PIXEL\_COUNTER\_INIT;

RAND\_NUM\_DRAW: next\_state = sig\_randNumDraw\_DONE ? INCRE\_CASC\_COUNTER : RAND\_NUM\_DRAW;

INCRE\_CASC\_COUNTER: next\_state = CASC\_COUNTER\_CHECK;

// Wait for moves

GAME\_WAIT\_FOR\_MOVE: next\_state = (sig\_move == 4'b0) ? GAME\_WAIT\_FOR\_MOVE : GAME\_STORE\_MOVE;

// Processing

GAME\_STORE\_MOVE: next\_state = GAME\_STORE\_MOVE\_WAIT;

GAME\_STORE\_MOVE\_WAIT: next\_state = (sig\_move == 4'b0) ? GAME\_PROCESS\_MOVE\_INIT : GAME\_STORE\_MOVE\_WAIT;

GAME\_PROCESS\_MOVE\_INIT: next\_state = GAME\_PROCESS\_ITER\_CHECK;

GAME\_PROCESS\_ITER\_CHECK: next\_state = sig\_doneProcess ? DEBUG\_DISPLAY\_BOARD\_2 : GAME\_PROCESS\_SET\_POS;////changed first result

GAME\_PROCESS\_SET\_POS: next\_state = GAME\_SET\_POS\_WAIT;

GAME\_SET\_POS\_WAIT: next\_state = GAME\_SET\_POS\_WAIT\_2;////////////////////////////////////////////////////////////////////

GAME\_SET\_POS\_WAIT\_2: next\_state = GAME\_PROCESS\_WITHIN\_BOUND;////////////////////////////////////////////////////////////////////

GAME\_PROCESS\_WITHIN\_BOUND: next\_state = sig\_toNoMove ? GAME\_PROCESS\_NO\_MOVE : GAME\_PROCESS\_SET\_NEXT\_POS;

GAME\_PROCESS\_SET\_NEXT\_POS: next\_state = GAME\_PROCESS\_CALC\_PRE;

// DEBUG\_SET\_NEXT\_POS\_WAIT: next\_state = GAME\_PROCESS\_CALC;

GAME\_PROCESS\_CALC\_PRE: next\_state = GAME\_PROCESS\_CALC;

GAME\_PROCESS\_CALC: next\_state = sig\_toNoMove ? GAME\_PROCESS\_NO\_MOVE : (sig\_toMergeMove ? GAME\_PROCESS\_MERGE\_MOVE\_UPDATE\_NEXT : (sig\_toJustMove ? GAME\_PROCESS\_JUST\_MOVE\_UPDATE\_NEXT : GAME\_PROCESS\_JUST\_MOVE\_UPDATE\_NEXT));

GAME\_PROCESS\_NO\_MOVE: next\_state = sig\_nextIteration ? GAME\_PROCESS\_ITER\_INCRE : NO\_MOVE\_LD\_EXT;

NO\_MOVE\_LD\_EXT: next\_state = NO\_MOVE\_LD\_EXT\_2;

NO\_MOVE\_LD\_EXT\_2: next\_state = GAME\_PROCESS\_WITHIN\_BOUND;

// DEBUG\_WAIT\_NO\_MOVE:

GAME\_PROCESS\_MERGE\_MOVE\_UPDATE\_NEXT: next\_state = GAME\_PROCESS\_MERGE\_MOVE\_UPDATE\_NEXT\_EXT;

GAME\_PROCESS\_MERGE\_MOVE\_UPDATE\_NEXT\_EXT: next\_state = GAME\_PROCESS\_MERGE\_MOVE\_UPDATE\_CUR;

GAME\_PROCESS\_MERGE\_MOVE\_UPDATE\_CUR: next\_state = GAME\_PROCESS\_MERGE\_MOVE\_UPDATE\_CUR\_EXT;

GAME\_PROCESS\_MERGE\_MOVE\_UPDATE\_CUR\_EXT: next\_state = GAME\_PROCESS\_NO\_MOVE;

GAME\_PROCESS\_JUST\_MOVE\_UPDATE\_NEXT: next\_state = GAME\_PROCESS\_JUST\_MOVE\_UPDATE\_NEXT\_EXT;

GAME\_PROCESS\_JUST\_MOVE\_UPDATE\_NEXT\_EXT: next\_state = GAME\_PROCESS\_JUST\_MOVE\_UPDATE\_CUR;

GAME\_PROCESS\_JUST\_MOVE\_UPDATE\_CUR: next\_state = GAME\_PROCESS\_JUST\_MOVE\_UPDATE\_CUR\_EXT;

GAME\_PROCESS\_JUST\_MOVE\_UPDATE\_CUR\_EXT: next\_state = GAME\_PROCESS\_NO\_MOVE;

GAME\_PROCESS\_ITER\_INCRE: next\_state = GAME\_PROCESS\_ITER\_CHECK;

// Debug display RAM

DEBUG\_DISPLAY\_BOARD\_2: next\_state = sig\_debug\_displayBoard\_DONE ? GAME\_DRAW\_INIT : DEBUG\_DISPLAY\_BOARD\_2; ////$########

// Spawn new number

GAME\_RAND\_NUM: next\_state = GAME\_CHECK\_NUM;

GAME\_CHECK\_NUM: next\_state = GAME\_CHECK\_NUM\_WAIT;

GAME\_CHECK\_NUM\_WAIT: next\_state = sig\_randNum\_GOOD ? GAME\_SPAWN\_NUM : (sig\_gameLose ? GAME\_END\_DRAW\_INIT : GAME\_RAND\_NUM); //////////////////sig\_randNum\_GOOD

GAME\_SPAWN\_NUM: next\_state = GAME\_CASC\_COUNTER\_INIT;

// Debug display RAM

// DEBUG\_DISPLAY\_BOARD: next\_state = sig\_debug\_displayBoard\_DONE ? GAME\_DRAW\_INIT : DEBUG\_DISPLAY\_BOARD; /////

// Draw new board

GAME\_DRAW\_INIT: next\_state = GAME\_DRAW\_COUNTER\_CHECK;

GAME\_DRAW\_COUNTER\_CHECK: next\_state = sig\_drawBoard\_Cont ? GAME\_DRAW\_LD\_XY : GAME\_RAND\_NUM;//$##############

GAME\_DRAW\_LD\_XY: next\_state = GAME\_DRAW\_LD\_VAL;

GAME\_DRAW\_LD\_VAL: next\_state = GAME\_DRAW\_LD\_VAL\_2;

GAME\_DRAW\_LD\_VAL\_2: next\_state = GAME\_DRAW;

GAME\_DRAW: next\_state = GAME\_DRAW\_COUNTER\_INCRE;

GAME\_DRAW\_COUNTER\_INCRE: next\_state = GAME\_DRAW\_COUNTER\_CHECK;

// GAME\_DRAW: next\_state = sig\_drawBoard\_DONE ? GAME\_WAIT\_FOR\_MOVE : GAME\_DRAW;

// Draws random number

GAME\_CASC\_COUNTER\_INIT: next\_state = GAME\_CASC\_COUNTER\_CHECK;

GAME\_CASC\_COUNTER\_CHECK: next\_state = sig\_doneCasc ? GAME\_WAIT\_FOR\_MOVE : GAME\_PIXEL\_COUNTER\_INIT;

GAME\_PIXEL\_COUNTER\_INIT: next\_state = CLOCK\_120HZ ? GAME\_RAND\_NUM\_DRAW : GAME\_PIXEL\_COUNTER\_INIT;

GAME\_RAND\_NUM\_DRAW: next\_state = sig\_randNumDraw\_DONE ? GAME\_INCRE\_CASC\_COUNTER : GAME\_RAND\_NUM\_DRAW;

GAME\_INCRE\_CASC\_COUNTER: next\_state = GAME\_CASC\_COUNTER\_CHECK;

// Game end sequence

GAME\_END\_DRAW\_INIT: next\_state = GAME\_END\_DRAW\_COUNTER\_CHECK;

GAME\_END\_DRAW\_COUNTER\_CHECK: next\_state = sig\_drawBoard\_Cont ? GAME\_END\_DRAW : GAME\_END;

GAME\_END\_DRAW: next\_state = GAME\_END\_DRAW\_COUNTER\_INCRE;

GAME\_END\_DRAW\_COUNTER\_INCRE: next\_state = GAME\_END\_DRAW\_COUNTER\_CHECK;

GAME\_END: next\_state = enter ? INIT\_CLEAR\_BOARD : GAME\_END;

default:next\_state = INIT\_CLEAR\_BOARD;

endcase

end // state\_table

always @(\*)

begin: enable\_signals

sig\_clearBoard = 1'b0;

sig\_checkRandNum = 1'b0;

sig\_spawnNumOnBoard = 1'b0;

sig\_drawBoard = 1'b0;

sig\_drawBoard\_init = 1'b0;

sig\_initDraw = 1'b0;

sig\_gameDraw = 1'b0;

sig\_gameEndDraw = 1'b0;

sig\_resetIteration = 1'b0;

sig\_iterationCheck = 1'b0;

sig\_setCurrentPOS = 1'b0;

sig\_setCurrentNextPOS = 1'b0;

sig\_checkBound = 1'b0;

sig\_calcMove = 1'b0;

sig\_noMove = 1'b0;

sig\_ldExt = 1'b0;//////////////////////////////////

sig\_mergeUpdateNext = 1'b0;

sig\_mergeUpdateCur = 1'b0;

sig\_noMergeUpdateNext = 1'b0;

sig\_noMergeUpdateCur = 1'b0;

sig\_iterationIncre = 1'b0;

sig\_debug\_displayBoard = 1'b0;//////////////////////////////////////

sig\_drawBoard\_CounterCheck = 1'b0;

sig\_getCur\_XY = 1'b0;

sig\_drawBoard\_CounterEn = 1'b0;

sig\_cascCounter\_init = 1'b0;

ld\_cascCounter = 1'b0;

sig\_casc\_CounterCheck = 1'b0;

sig\_pixelCounter\_init = 1'b0;

sig\_pixel\_CounterEn = 1'b0;

sig\_drawRandNum = 1'b0;

sel\_randNum\_XY = 1'b0;

sel\_randNum\_Colour = 1'b0;

sig\_cascCounter\_Incre = 1'b0;

gameRAM\_writeEn = 1'b0;

ld\_randomNum = 1'b0;

ld\_move = 1'b0;

ld\_iterationCounter = 1'b0;

ld\_gameBoard\_cur\_X = 1'b0;

ld\_gameBoard\_cur\_Y = 1'b0;

ld\_gameBoard\_cur\_Value = 1'b0;

ld\_gameBoard\_next\_X = 1'b0;

ld\_gameBoard\_next\_Y = 1'b0;

LFBSR\_enable = 1'b0;

writeEn = 1'b0;

sig\_getHighscore = 1'b0;

ld\_highscore = 1'b0;

sig\_drawEnd = 1'b0;

case (current\_state)

GAME\_END\_DRAW\_INIT: begin

sig\_drawBoard\_init = 1'b1;

end

GAME\_END\_DRAW\_COUNTER\_CHECK: begin

sig\_drawBoard\_CounterCheck = 1'b1;

end

GAME\_END\_DRAW: begin

sig\_drawEnd = 1'b1;

writeEn = 1'b1;

end

GAME\_END\_DRAW\_COUNTER\_INCRE: begin

sig\_drawBoard\_CounterEn = 1'b1;

end

GAME\_INCRE\_CASC\_COUNTER: begin

sig\_cascCounter\_Incre = 1'b1;

ld\_cascCounter = 1'b1;

end

GAME\_RAND\_NUM\_DRAW: begin

sig\_drawRandNum = 1'b1;

sig\_pixel\_CounterEn = 1'b1;

sel\_randNum\_XY = 1'b1;

sel\_randNum\_Colour = 1'b1;

writeEn = 1'b1;

end

GAME\_PIXEL\_COUNTER\_INIT: begin

sig\_pixelCounter\_init = 1'b1;

end

GAME\_CASC\_COUNTER\_CHECK: begin

sig\_casc\_CounterCheck = 1'b1;

end

GAME\_CASC\_COUNTER\_INIT: begin

sig\_cascCounter\_init = 1'b1;

ld\_cascCounter = 1'b1;

end

INCRE\_CASC\_COUNTER: begin

sig\_cascCounter\_Incre = 1'b1;

ld\_cascCounter = 1'b1;

end

RAND\_NUM\_DRAW: begin

sig\_drawRandNum = 1'b1;

sig\_pixel\_CounterEn = 1'b1;

sel\_randNum\_XY = 1'b1;

sel\_randNum\_Colour = 1'b1;

writeEn = 1'b1;

end

PIXEL\_COUNTER\_INIT: begin

sig\_pixelCounter\_init = 1'b1;

end

CASC\_COUNTER\_CHECK: begin

sig\_casc\_CounterCheck = 1'b1;

end

CASC\_COUNTER\_INIT: begin

sig\_cascCounter\_init = 1'b1;

ld\_cascCounter = 1'b1;

end

INIT\_CLEAR\_BOARD: begin

sig\_clearBoard = 1'b1;

gameRAM\_writeEn = 1'b1;

ld\_highscore = 1'b1;

end

INIT\_RAND\_NUM: begin

LFBSR\_enable = 1'b1;

ld\_randomNum = 1'b1;

end

INIT\_CHECK\_NUM: begin

sig\_checkRandNum = 1'b1;

end

INIT\_SPAWN\_NUM: begin

sig\_spawnNumOnBoard = 1'b1;

gameRAM\_writeEn = 1'b1;

end

INIT\_DRAW\_INIT: begin

sig\_drawBoard\_init = 1'b1;

end

INIT\_DRAW\_COUNTER\_CHECK: begin

sig\_drawBoard\_CounterCheck = 1'b1;

end

INIT\_DRAW\_LD\_XY: begin

sig\_getCur\_XY = 1'b1;

ld\_gameBoard\_cur\_X = 1'b1;

ld\_gameBoard\_cur\_Y = 1'b1;

end

INIT\_DRAW\_LD\_VAL: begin

sig\_ldExt = 1'b1;

ld\_gameBoard\_cur\_Value = 1'b1;

end

INIT\_DRAW\_LD\_VAL\_2: begin

sig\_ldExt = 1'b1;

ld\_gameBoard\_cur\_Value = 1'b1;

end

INIT\_DRAW: begin

sig\_drawBoard = 1'b1;

writeEn = 1'b1;

end

INIT\_DRAW\_COUNTER\_INCRE: begin

sig\_drawBoard\_CounterEn = 1'b1;

end

GAME\_STORE\_MOVE: begin

ld\_move = 1'b1;

end

GAME\_PROCESS\_MOVE\_INIT: begin

sig\_resetIteration = 1'b1;

ld\_iterationCounter = 1'b1;

end

GAME\_PROCESS\_ITER\_CHECK: begin

sig\_iterationCheck = 1'b1;

end

GAME\_PROCESS\_SET\_POS: begin

sig\_setCurrentPOS = 1'b1;

ld\_gameBoard\_cur\_X = 1'b1;

ld\_gameBoard\_cur\_Y = 1'b1;

ld\_gameBoard\_cur\_Value = 1'b1;

end

GAME\_SET\_POS\_WAIT: begin

sig\_ldExt = 1'b1;

ld\_gameBoard\_cur\_Value = 1'b1;

end

GAME\_SET\_POS\_WAIT\_2: begin

sig\_ldExt = 1'b1;

ld\_gameBoard\_cur\_Value = 1'b1;

sig\_getHighscore = 1'b1;

ld\_highscore = 1'b1;

end

GAME\_PROCESS\_WITHIN\_BOUND: begin

sig\_checkBound = 1'b1;

end

GAME\_PROCESS\_SET\_NEXT\_POS: begin

sig\_setCurrentNextPOS = 1'b1;

ld\_gameBoard\_next\_X = 1'b1;

ld\_gameBoard\_next\_Y = 1'b1;

end

GAME\_PROCESS\_CALC\_PRE: begin

sig\_calcMove = 1'b1;

end

GAME\_PROCESS\_CALC: begin

sig\_calcMove = 1'b1;

end

GAME\_PROCESS\_NO\_MOVE: begin

sig\_noMove = 1'b1;

ld\_gameBoard\_cur\_X = 1'b1;

ld\_gameBoard\_cur\_Y = 1'b1;

ld\_gameBoard\_cur\_Value = 1'b1;

sig\_getHighscore = 1'b1;

ld\_highscore = 1'b1;

end

NO\_MOVE\_LD\_EXT: begin

sig\_ldExt = 1'b1;

ld\_gameBoard\_cur\_Value = 1'b1;

sig\_getHighscore = 1'b1;

ld\_highscore = 1'b1;

end

NO\_MOVE\_LD\_EXT\_2: begin

sig\_ldExt = 1'b1;

ld\_gameBoard\_cur\_Value = 1'b1;

sig\_getHighscore = 1'b1;

ld\_highscore = 1'b1;

end

// DEBUG\_WAIT\_NO\_MOVE: begin

// end

GAME\_PROCESS\_MERGE\_MOVE\_UPDATE\_NEXT: begin

sig\_mergeUpdateNext = 1'b1;

gameRAM\_writeEn = 1'b1;

end

GAME\_PROCESS\_MERGE\_MOVE\_UPDATE\_NEXT\_EXT: begin

sig\_mergeUpdateNext = 1'b1;

gameRAM\_writeEn = 1'b1;

end

GAME\_PROCESS\_MERGE\_MOVE\_UPDATE\_CUR: begin

sig\_mergeUpdateCur = 1'b1;

gameRAM\_writeEn = 1'b1;

end

GAME\_PROCESS\_MERGE\_MOVE\_UPDATE\_CUR\_EXT: begin

sig\_mergeUpdateCur = 1'b1;

gameRAM\_writeEn = 1'b1;

end

GAME\_PROCESS\_JUST\_MOVE\_UPDATE\_NEXT: begin

sig\_noMergeUpdateNext = 1'b1;

gameRAM\_writeEn = 1'b1;

end

GAME\_PROCESS\_JUST\_MOVE\_UPDATE\_NEXT\_EXT: begin

sig\_noMergeUpdateNext = 1'b1;

gameRAM\_writeEn = 1'b1;

end

GAME\_PROCESS\_JUST\_MOVE\_UPDATE\_CUR: begin

sig\_noMergeUpdateCur = 1'b1;

gameRAM\_writeEn = 1'b1;

end

GAME\_PROCESS\_JUST\_MOVE\_UPDATE\_CUR\_EXT: begin

sig\_noMergeUpdateCur = 1'b1;

gameRAM\_writeEn = 1'b1;

end

GAME\_PROCESS\_ITER\_INCRE: begin

sig\_iterationIncre = 1'b1;

ld\_iterationCounter = 1'b1;

end

GAME\_RAND\_NUM: begin

LFBSR\_enable = 1'b1;

ld\_randomNum = 1'b1;

end

GAME\_CHECK\_NUM: begin

sig\_checkRandNum = 1'b1;

end

GAME\_CHECK\_NUM\_WAIT: begin

sig\_checkRandNum = 1'b1;

end

GAME\_SPAWN\_NUM: begin

sig\_spawnNumOnBoard = 1'b1;

gameRAM\_writeEn = 1'b1;

end

DEBUG\_DISPLAY\_BOARD: begin

sig\_debug\_displayBoard = 1'b1;

end

DEBUG\_DISPLAY\_BOARD\_2: begin

sig\_debug\_displayBoard = 1'b1;

end

GAME\_DRAW\_INIT: begin

sig\_drawBoard\_init = 1'b1;

end

GAME\_DRAW\_COUNTER\_CHECK: begin

sig\_drawBoard\_CounterCheck = 1'b1;

end

GAME\_DRAW\_LD\_XY: begin

sig\_getCur\_XY = 1'b1;

ld\_gameBoard\_cur\_X = 1'b1;

ld\_gameBoard\_cur\_Y = 1'b1;

end

GAME\_DRAW\_LD\_VAL: begin

sig\_ldExt = 1'b1;

ld\_gameBoard\_cur\_Value = 1'b1;

end

GAME\_DRAW\_LD\_VAL\_2: begin

sig\_ldExt = 1'b1;

ld\_gameBoard\_cur\_Value = 1'b1;

end

GAME\_DRAW: begin

sig\_drawBoard = 1'b1;

writeEn = 1'b1;

end

GAME\_DRAW\_COUNTER\_INCRE: begin

sig\_drawBoard\_CounterEn = 1'b1;

end

endcase

end

always@(posedge CLOCK\_50)

begin: state\_FFs

if(!resetn)

current\_state <= INIT\_CLEAR\_BOARD;

else

current\_state <= next\_state;

end // state\_FFS

assign stateLEDs = {{3'b0}, current\_state};

endmodule

module datapath(

// Standard I/O

input CLOCK\_50,

input resetn,

input [3:0] sig\_move,

// Signals from control

input sig\_clearBoard,

input sig\_checkRandNum,

input sig\_spawnNumOnBoard,

input sig\_drawBoard,

input sig\_drawBoard\_init,

input sig\_initDraw,

input sig\_gameDraw,

input sig\_gameEndDraw,

input sig\_resetIteration,

input sig\_iterationCheck,

input sig\_setCurrentPOS,

input sig\_setCurrentNextPOS,

input sig\_checkBound,

input sig\_calcMove,

input sig\_noMove,

input sig\_ldExt,////////////////////////////////////////////////////////

input sig\_mergeUpdateNext,

input sig\_mergeUpdateCur,

input sig\_noMergeUpdateNext,

input sig\_noMergeUpdateCur,

input sig\_iterationIncre,

input sig\_debug\_displayBoard,/////////////////////////////////////////////////////////////

input sig\_drawBoard\_CounterCheck,

input sig\_getCur\_XY,

input sig\_drawBoard\_CounterEn,

input gameRAM\_writeEn,

input ld\_randomNum,

input ld\_move,

input ld\_iterationCounter,

input ld\_gameBoard\_cur\_X,

input ld\_gameBoard\_cur\_Y,

input ld\_gameBoard\_cur\_Value,

input ld\_gameBoard\_next\_X,

input ld\_gameBoard\_next\_Y,

input LFBSR\_enable,

// Signals to control

output reg sig\_clearBoard\_DONE,

output reg sig\_randNum\_GOOD,

output reg sig\_drawBoard\_DONE,

output reg sig\_doneProcess,

output reg sig\_toNoMove,

output reg sig\_toMergeMove,

output reg sig\_toJustMove,

output reg sig\_nextIteration,

output reg sig\_debug\_displayBoard\_DONE, /////////////////////////////////////////////////////////////////////

output reg sig\_drawBoard\_Cont,

// Game RAM I/O

input [11:0] gameRAM\_DataOut,

output reg [11:0] gameRAM\_DataIn,

output reg [3:0] gameRAM\_Addr,

// VGA output

output reg [8:0] x,

output reg [7:0] y,

output reg [2:0] colour,

// output reg [8:0] screen\_X,

// output reg [7:0] screen\_Y,

// output reg [2:0] pixel\_colour,

output reg [5:0] effective\_X,

output reg [5:0] effective\_Y,

output reg [5:0] rand\_eff\_X,

output reg [5:0] rand\_eff\_Y,

////////////////// Debug signals

output reg [1:0] gameBoard\_cur\_X, gameBoard\_next\_X, gameBoard\_cur\_Y, gameBoard\_next\_Y, temp\_X, temp\_Y,

output reg [11:0] gameBoard\_cur\_Value,

output reg [3:0] randomNum\_reg,

output [4:0] randomNum,

output reg [6:0] casc\_Counter, temp\_casc\_Counter,

output reg sig\_doneCasc,

output reg sig\_randNumDraw\_DONE,

input sig\_cascCounter\_init,

input ld\_cascCounter,

input sig\_casc\_CounterCheck,

input sig\_pixelCounter\_init,

input sig\_pixel\_CounterEn,

input sig\_drawRandNum,

input sel\_randNum\_XY,

input sel\_randNum\_Colour,

input sig\_cascCounter\_Incre,

input sig\_getHighscore,

input ld\_highscore,

output reg sig\_gameLose,

// output reg [3:0] badMoves

input sig\_drawEnd,

input colourful

);

// reg [3:0] randomNum\_reg;

reg [3:0] move\_reg;

// reg [1:0] gameBoard\_cur\_X;

// reg [1:0] gameBoard\_next\_X;

// reg [1:0] temp\_X;

// reg [1:0] gameBoard\_cur\_Y;

// reg [1:0] gameBoard\_next\_Y;

// reg [1:0] temp\_Y;

// reg [11:0] gameBoard\_cur\_Value;

// wire [3:0] randomNum;

// To VGA

reg [8:0] screen\_X;

reg [7:0] screen\_Y;

reg [2:0] pixel\_colour;

// reg [5:0] effective\_X;

// reg [5:0] effective\_Y;

reg [8:0] rand\_X;

reg [7:0] rand\_Y;

reg [2:0] rand\_colour;

reg [11:0] highscore, temp\_highscore;

wire [11:0] randNum\_12b;

Linear\_FB\_Shift\_Reg\_12b randColour(

.CLOCK\_50(CLOCK\_50),

.resetn(resetn),

.LFBSR\_enable(LFBSR\_enable),

.out(randNum\_12b)

);

// reg [5:0] rand\_eff\_X;

// reg [5:0] rand\_eff\_Y;

always @ (\*) begin

if (sel\_randNum\_XY) begin

x = rand\_X;

y = rand\_Y;

end

else begin

x = screen\_X;

y = screen\_Y;

end

if (sel\_randNum\_Colour) begin

colour = rand\_colour;

end

else begin

colour = pixel\_colour;

end

end

// Iteration counter, loops through number of times we looked at the board

reg [2:0] iteration\_Counter, temp\_iter\_counter;

// reg [6:0] casc\_Counter, temp\_casc\_Counter;

// Registers

always@(posedge CLOCK\_50) begin

if(!resetn) begin

highscore <= 12'b0;

randomNum\_reg <= 4'b0;

move\_reg <= 4'b0;

iteration\_Counter <= 3'b0;

casc\_Counter <= 7'b0;

end

else begin

if(ld\_highscore) begin

highscore <= temp\_highscore;

end

if(ld\_randomNum) begin

randomNum\_reg <= randomNum[4:1];

end

if(ld\_move) begin

move\_reg <= sig\_move;

end

if(ld\_iterationCounter) begin

iteration\_Counter <= temp\_iter\_counter;

end

if(ld\_gameBoard\_cur\_X) begin

gameBoard\_cur\_X <= temp\_X;

end

if(ld\_gameBoard\_cur\_Y) begin

gameBoard\_cur\_Y <= temp\_Y;

end

if(ld\_gameBoard\_cur\_Value) begin

gameBoard\_cur\_Value <= gameRAM\_DataOut;

end

if(ld\_gameBoard\_next\_X) begin

gameBoard\_next\_X <= temp\_X;

end

if(ld\_gameBoard\_next\_Y) begin

gameBoard\_next\_Y <= temp\_Y;

end

if(ld\_cascCounter) begin

casc\_Counter <= temp\_casc\_Counter;

end

end

end

// INIT state

// Clearing board

reg [4:0] clearBoard\_Counter;

always @(posedge CLOCK\_50) begin

if (!resetn) begin

clearBoard\_Counter <= 5'b0;

end

else if (clearBoard\_Counter == 5'b10000) begin

clearBoard\_Counter <= 5'b0;

end

else if (sig\_clearBoard) begin

clearBoard\_Counter <= clearBoard\_Counter + 1'b1;

end

end

/////////////////////////////////////////////////////////////////////// Debug display board

reg [4:0] displayBoard\_Counter;

always @(posedge CLOCK\_50) begin

if (!resetn) begin

displayBoard\_Counter <= 5'b0;

end

else if (displayBoard\_Counter == 5'b10000) begin

displayBoard\_Counter <= 5'b0;

end

else if (sig\_debug\_displayBoard) begin

displayBoard\_Counter <= displayBoard\_Counter + 1'b1;

end

end

always @(posedge CLOCK\_50, negedge resetn) begin

if (!resetn) begin

rand\_X <= 9'd0;

rand\_Y <= 8'd0;

end

else if (sig\_pixelCounter\_init) begin

rand\_X <= ((randomNum\_reg[3:2] \* 6'd59) + 2'd3);

rand\_Y <= ((randomNum\_reg[1:0] \* 6'd59) + 2'd3);

end

else if (sig\_pixel\_CounterEn) begin

if (((rand\_X - 2'd3) - (((randomNum\_reg[3:2]) \* (6'd59)))) == casc\_Counter) begin

rand\_X <= ((randomNum\_reg[3:2] \* 6'd59) + 2'd3);

rand\_Y <= rand\_Y + 1'b1;

end

else begin

rand\_X <= rand\_X + 1'b1;

end

end

end

// Random number gen

Linear\_FB\_Shift\_Reg\_5b randGen(//////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////

.CLOCK\_50(CLOCK\_50),

.resetn(resetn),

.LFBSR\_enable(LFBSR\_enable),

.out(randomNum)

);

// counter\_4b fakeRandGen(

// .CLOCK\_50(CLOCK\_50),

// .resetn(resetn),

// .counter\_4b\_enable(LFBSR\_enable),

// .out(randomNum[4:1])

// );

// Implement if we want to generate 2 new random numbers each time

// reg [1:0] initRand\_Counter;

//

// always @(posedge CLOCK\_50) begin

// if (!resetn) begin

// initRand\_Counter <= 2'b0;

// end

// else if (initRand\_Counter == 2'b10) begin

// initRand\_Counter <= 2'b0;

// end

// else if () begin

// initRand\_Counter <= initRand\_Counter + 1'b1;

// end

// end

// Counter to track number of random numbers generated

reg [6:0] randNum\_counter;

always @(posedge CLOCK\_50) begin

if (!resetn) begin

randNum\_counter <= 7'b0;

end

else if (sig\_spawnNumOnBoard) begin

randNum\_counter <= 7'b0;

end

else if (LFBSR\_enable) begin

randNum\_counter <= randNum\_counter + 1'b1;

end

end

// All calculations / checking

always @(\*)

begin : ALU

sig\_randNum\_GOOD = 1'b0;

sig\_doneProcess = 1'b0;

sig\_toNoMove = 1'b0;

sig\_toMergeMove = 1'b0;

sig\_toJustMove = 1'b0;

sig\_nextIteration = 1'b0;

temp\_X = 2'b0;

temp\_Y = 2'b0;

temp\_iter\_counter = 3'b0;

sig\_drawBoard\_Cont = 1'b1;

sig\_doneCasc = 1'b0;

temp\_casc\_Counter = 7'b0;

temp\_highscore = 12'b0;

sig\_gameLose = 1'b0;

if (sig\_getHighscore) begin

if (gameBoard\_cur\_Value > highscore) begin

temp\_highscore = gameBoard\_cur\_Value;

end

else if (sig\_clearBoard) begin

temp\_highscore = 12'b0;

end

else begin

temp\_highscore = highscore;

end

end

if (sig\_checkRandNum) begin

if (gameRAM\_DataOut == 12'd0) begin

sig\_randNum\_GOOD = 1'b1;

end

if (randNum\_counter == 7'd100) begin

sig\_gameLose = 1'b1;

end

end

if (sig\_resetIteration) begin

temp\_iter\_counter = 3'b0;

end

if (sig\_iterationCheck) begin

if (iteration\_Counter == 3'b101) begin

sig\_doneProcess = 1'b1;

end

end

if (sig\_setCurrentPOS) begin

case (move\_reg)

4'b1000: ; // Left: x: 00 -> 11, starting y don't care

4'b0100: ; // Up: starting x don't care, y: 00 -> 11

4'b0010: temp\_Y = 2'b11; // Down: starting x don't care, y: 11 -> 00

4'b0001: temp\_X = 2'b11; // Right: x: 11 -> 00, starting y don't care

endcase

// temp\_X = 2'b00;///////////////////////////////////////////////////////////////////////////////////////////////////////////////////

// temp\_Y = 2'b11;//////////////////////////////////////////////////////////////////////////////////////////////

end

if (sig\_checkBound) begin

if ((gameBoard\_cur\_X == 2'b00 && move\_reg[3]) || // Left: check from left to right, left most row no need to check

(gameBoard\_cur\_Y == 2'b00 && move\_reg[2]) || // Up: check from up to down, top most row no need to check

(gameBoard\_cur\_Y == 2'b11 && move\_reg[1]) || // Down: check from down to up, bottom most row no need to check

(gameBoard\_cur\_X == 2'b11 && move\_reg[0])) begin // Right: check from right to left, right most row no need to check

sig\_toNoMove = 1'b1;

end

end

if (sig\_setCurrentNextPOS) begin

temp\_X = gameBoard\_cur\_X;

temp\_Y = gameBoard\_cur\_Y;

case (move\_reg)

4'b1000: temp\_X = gameBoard\_cur\_X - 1'b1; // Left: Look to -x

4'b0100: temp\_Y = gameBoard\_cur\_Y - 1'b1; // Up: Look to -y

4'b0010: temp\_Y = gameBoard\_cur\_Y + 1'b1; // Down: Look to +y

4'b0001: temp\_X = gameBoard\_cur\_X + 1'b1; // Right:Look to +x

endcase

end

if (sig\_calcMove) begin

if (gameRAM\_DataOut == 12'b0) begin

sig\_toJustMove = 1'b1;

end

else if (gameRAM\_DataOut == gameBoard\_cur\_Value) begin

sig\_toMergeMove = 1'b1;

end

else begin

sig\_toNoMove = 1'b1;

end

end

if (sig\_noMove) begin

case (move\_reg)

4'b1000: begin // Left: Cycles through y, move right one row in y when done

if (gameBoard\_cur\_X == 2'b11 && gameBoard\_cur\_Y == 2'b11) begin

sig\_nextIteration = 1'b1;

end

else if (gameBoard\_cur\_Y == 2'b11) begin

temp\_Y = 2'b00;

temp\_X = gameBoard\_cur\_X + 1'b1;

end

else begin

temp\_X = gameBoard\_cur\_X;

temp\_Y = gameBoard\_cur\_Y + 1'b1;

end

end

4'b0100: begin // Up: Cycles through x, move down one row in y when done

if (gameBoard\_cur\_X == 2'b11 && gameBoard\_cur\_Y == 2'b11) begin

sig\_nextIteration = 1'b1;

end

else if (gameBoard\_cur\_X == 2'b11) begin

temp\_X = 2'b00;

temp\_Y = gameBoard\_cur\_Y + 1'b1;

end

else begin

temp\_Y = gameBoard\_cur\_Y;

temp\_X = gameBoard\_cur\_X + 1'b1;

end

end

4'b0010: begin // Down: Cycles through x, move up one row in y when done

if (gameBoard\_cur\_X == 2'b11 && gameBoard\_cur\_Y == 2'b00) begin

sig\_nextIteration = 1'b1;

end

else if (gameBoard\_cur\_X == 2'b11) begin

temp\_X = 2'b00;

temp\_Y = gameBoard\_cur\_Y - 1'b1;

end

else begin

temp\_Y = gameBoard\_cur\_Y;

temp\_X = gameBoard\_cur\_X + 1'b1;

end

end

4'b0001: begin // Right: Cycles through y, move left one row in y when done

if (gameBoard\_cur\_X == 2'b00 && gameBoard\_cur\_Y == 2'b11) begin

sig\_nextIteration = 1'b1;

end

else if (gameBoard\_cur\_Y == 2'b11) begin

temp\_Y = 2'b00;

temp\_X = gameBoard\_cur\_X - 1'b1;

end

else begin

temp\_X = gameBoard\_cur\_X;

temp\_Y = gameBoard\_cur\_Y + 1'b1;

end

end

endcase

end

if (sig\_iterationIncre) begin

temp\_iter\_counter = iteration\_Counter + 1'b1;

end

if (sig\_getCur\_XY) begin

if (screen\_X >= 9'd3 && screen\_X <= 9'd59) begin

temp\_X = 2'b00;

end

else if (screen\_X >= 9'd62 && screen\_X <= 9'd118) begin

temp\_X = 2'b01;

end

else if (screen\_X >= 9'd121 && screen\_X <= 9'd177) begin

temp\_X = 2'b10;

end

else if (screen\_X >= 9'd180 && screen\_X <= 9'd236) begin

temp\_X = 2'b11;

end

if (screen\_Y >= 8'd3 && screen\_Y <= 8'd59) begin

temp\_Y = 2'b00;

end

else if (screen\_Y >= 8'd62 && screen\_Y <= 8'd118) begin

temp\_Y = 2'b01;

end

else if (screen\_Y >= 8'd121 && screen\_Y <= 8'd177) begin

temp\_Y = 2'b10;

end

else if (screen\_Y >= 8'd180 && screen\_Y <= 8'd236) begin

temp\_Y = 2'b11;

end

end

if (sig\_drawBoard\_CounterCheck) begin

if (screen\_Y == 8'd240) begin

sig\_drawBoard\_Cont = 1'b0;

end

end

if (sig\_cascCounter\_init) begin

temp\_casc\_Counter = 7'b0;

end

if (sig\_casc\_CounterCheck) begin

if (casc\_Counter == 7'd57) begin

sig\_doneCasc = 1'b1;

end

end

if (sig\_cascCounter\_Incre) begin

temp\_casc\_Counter = casc\_Counter + 1'b1;

end

end

// Game RAM address mux

always @(\*) begin

gameRAM\_Addr = 4'b0;

if (sig\_clearBoard) begin

gameRAM\_Addr = clearBoard\_Counter[3:0];

end

if (sig\_checkRandNum) begin

gameRAM\_Addr = randomNum\_reg;

end

if (sig\_spawnNumOnBoard) begin

gameRAM\_Addr = randomNum\_reg;

end

if (sig\_setCurrentPOS) begin

gameRAM\_Addr = {gameBoard\_cur\_X, gameBoard\_cur\_Y};

end

if (sig\_calcMove) begin

gameRAM\_Addr = {gameBoard\_next\_X, gameBoard\_next\_Y};

end

if (sig\_ldExt) begin

gameRAM\_Addr = {gameBoard\_cur\_X, gameBoard\_cur\_Y};

end

if (sig\_mergeUpdateNext) begin

gameRAM\_Addr = {gameBoard\_next\_X, gameBoard\_next\_Y};

end

if (sig\_mergeUpdateCur) begin

gameRAM\_Addr = {gameBoard\_cur\_X, gameBoard\_cur\_Y};

end

if (sig\_noMergeUpdateNext) begin

gameRAM\_Addr = {gameBoard\_next\_X, gameBoard\_next\_Y};

end

if (sig\_noMergeUpdateCur) begin

gameRAM\_Addr = {gameBoard\_cur\_X, gameBoard\_cur\_Y};

end

if (sig\_drawBoard) begin

gameRAM\_Addr = {gameBoard\_cur\_X, gameBoard\_cur\_Y};

end

if (sig\_debug\_displayBoard) begin////////////////////////////////////////////////////////////////

gameRAM\_Addr = displayBoard\_Counter[3:0];

end

// if (sig\_noMove) begin

// gameRAM\_Addr = {gameBoard\_cur\_X, gameBoard\_cur\_Y};

// end

end

// Game RAM DataIn mux

always @(\*) begin

gameRAM\_DataIn = 12'd0;

if (sig\_clearBoard) begin

gameRAM\_DataIn = 12'd0;

end

if (sig\_spawnNumOnBoard) begin

gameRAM\_DataIn = 12'd2;

end

if (sig\_mergeUpdateNext) begin

gameRAM\_DataIn = gameBoard\_cur\_Value << 1; // Note 4096 + 4096 = 0 due to overflow

end

if (sig\_mergeUpdateCur) begin

gameRAM\_DataIn = 12'd0;

end

if (sig\_noMergeUpdateNext) begin

gameRAM\_DataIn = gameBoard\_cur\_Value;

end

if (sig\_noMergeUpdateCur) begin

gameRAM\_DataIn = 12'd0;

end

end

// Done signal outputs

always @(\*) begin

if (!resetn) begin

sig\_clearBoard\_DONE = 1'b0;

sig\_drawBoard\_DONE = 1'b0;

sig\_debug\_displayBoard\_DONE = 1'b0;

sig\_randNumDraw\_DONE = 1'b0;

end

else begin

sig\_clearBoard\_DONE = (clearBoard\_Counter == 5'b10000);

sig\_drawBoard\_DONE = (screen\_Y == 8'd240);

sig\_debug\_displayBoard\_DONE = (displayBoard\_Counter == 5'b10000);

sig\_randNumDraw\_DONE = ((((rand\_X - 2'd3) - ((randomNum\_reg[3:2]) \* (6'd59))) >= casc\_Counter) && (((rand\_Y - 2'd3) - ((randomNum\_reg[1:0]) \* (6'd59))) >= casc\_Counter));

end

end

// Iterating through the game board area

always @(posedge CLOCK\_50, negedge resetn) begin

if (!resetn) begin

screen\_X <= 9'd0;

screen\_Y <= 8'd0;

end

else if (sig\_drawBoard\_init) begin

screen\_X <= 9'd0;

screen\_Y <= 8'd0;

end

else if (sig\_drawBoard\_CounterEn) begin

if(screen\_X == 9'd318) begin

screen\_X <= 9'd0;

screen\_Y <= screen\_Y + 1'b1;

end

else begin

screen\_X <= screen\_X + 1'b1;

end

end

end

always @(\*) begin

pixel\_colour = 3'b000;

rand\_colour = 3'b000;

if (sig\_drawEnd) begin

if (screen\_X >= 9'd240 && screen\_X <= 9'd319 && screen\_Y <= 8'd119) begin

if ((screen\_X == 9'd247 && screen\_Y == 8'd8) ||

(screen\_X == 9'd247 && screen\_Y == 8'd9) ||

(screen\_X == 9'd247 && screen\_Y == 8'd10) ||

(screen\_X == 9'd247 && screen\_Y == 8'd11) ||

(screen\_X == 9'd247 && screen\_Y == 8'd12) ||

(screen\_X == 9'd247 && screen\_Y == 8'd13) ||

(screen\_X == 9'd247 && screen\_Y == 8'd14) ||

(screen\_X == 9'd247 && screen\_Y == 8'd15) ||

(screen\_X == 9'd247 && screen\_Y == 8'd16) ||

(screen\_X == 9'd247 && screen\_Y == 8'd17) ||

(screen\_X == 9'd247 && screen\_Y == 8'd18) ||

(screen\_X == 9'd247 && screen\_Y == 8'd19) ||

(screen\_X == 9'd247 && screen\_Y == 8'd20) ||

(screen\_X == 9'd248 && screen\_Y == 8'd13) ||

(screen\_X == 9'd249 && screen\_Y == 8'd13) ||

(screen\_X == 9'd250 && screen\_Y == 8'd13) ||

(screen\_X == 9'd251 && screen\_Y == 8'd13) ||

(screen\_X == 9'd252 && screen\_Y == 8'd13) ||

(screen\_X == 9'd253 && screen\_Y == 8'd13) ||

(screen\_X == 9'd254 && screen\_Y == 8'd13) ||

(screen\_X == 9'd255 && screen\_Y == 8'd8) ||

(screen\_X == 9'd255 && screen\_Y == 8'd9) ||

(screen\_X == 9'd255 && screen\_Y == 8'd10) ||

(screen\_X == 9'd255 && screen\_Y == 8'd11) ||

(screen\_X == 9'd255 && screen\_Y == 8'd12) ||

(screen\_X == 9'd255 && screen\_Y == 8'd13) ||

(screen\_X == 9'd255 && screen\_Y == 8'd14) ||

(screen\_X == 9'd255 && screen\_Y == 8'd15) ||

(screen\_X == 9'd255 && screen\_Y == 8'd16) ||

(screen\_X == 9'd255 && screen\_Y == 8'd17) ||

(screen\_X == 9'd255 && screen\_Y == 8'd18) ||

(screen\_X == 9'd255 && screen\_Y == 8'd19) ||

(screen\_X == 9'd255 && screen\_Y == 8'd20)

) begin // H

pixel\_colour = colourful ? ((randNum\_12b[11:9] == 3'b0) ? 3'b111 : randNum\_12b[11:9]) : 3'b111;

end

if ((screen\_X == 9'd258 && screen\_Y == 8'd9) ||

(screen\_X == 9'd258 && screen\_Y == 8'd12) ||

(screen\_X == 9'd258 && screen\_Y == 8'd13) ||

(screen\_X == 9'd258 && screen\_Y == 8'd14) ||

(screen\_X == 9'd258 && screen\_Y == 8'd15) ||

(screen\_X == 9'd258 && screen\_Y == 8'd16) ||

(screen\_X == 9'd258 && screen\_Y == 8'd17) ||

(screen\_X == 9'd258 && screen\_Y == 8'd18)

) begin // i

pixel\_colour = colourful ? ((randNum\_12b[10:8] == 3'b0) ? 3'b111 : randNum\_12b[10:8]) : 3'b111;

end

if ((screen\_X == 9'd261 && screen\_Y == 8'd12) ||

(screen\_X == 9'd261 && screen\_Y == 8'd13) ||

(screen\_X == 9'd261 && screen\_Y == 8'd14) ||

(screen\_X == 9'd261 && screen\_Y == 8'd15) ||

(screen\_X == 9'd261 && screen\_Y == 8'd16) ||

(screen\_X == 9'd261 && screen\_Y == 8'd17) ||

(screen\_X == 9'd261 && screen\_Y == 8'd18) ||

(screen\_X == 9'd265 && screen\_Y == 8'd12) ||

(screen\_X == 9'd265 && screen\_Y == 8'd13) ||

(screen\_X == 9'd265 && screen\_Y == 8'd14) ||

(screen\_X == 9'd265 && screen\_Y == 8'd15) ||

(screen\_X == 9'd265 && screen\_Y == 8'd16) ||

(screen\_X == 9'd265 && screen\_Y == 8'd17) ||

(screen\_X == 9'd265 && screen\_Y == 8'd18) ||

(screen\_X == 9'd265 && screen\_Y == 8'd19) ||

(screen\_X == 9'd265 && screen\_Y == 8'd20) ||

(screen\_X == 9'd265 && screen\_Y == 8'd21) ||

(screen\_X == 9'd265 && screen\_Y == 8'd22) ||

(screen\_X == 9'd265 && screen\_Y == 8'd23) ||

(screen\_X == 9'd265 && screen\_Y == 8'd24) ||

(screen\_X == 9'd262 && screen\_Y == 8'd12) ||

(screen\_X == 9'd263 && screen\_Y == 8'd12) ||

(screen\_X == 9'd264 && screen\_Y == 8'd12) ||

(screen\_X == 9'd262 && screen\_Y == 8'd18) ||

(screen\_X == 9'd263 && screen\_Y == 8'd18) ||

(screen\_X == 9'd264 && screen\_Y == 8'd18) ||

(screen\_X == 9'd261 && screen\_Y == 8'd22) ||

(screen\_X == 9'd261 && screen\_Y == 8'd23) ||

(screen\_X == 9'd261 && screen\_Y == 8'd24) ||

(screen\_X == 9'd262 && screen\_Y == 8'd24) ||

(screen\_X == 9'd263 && screen\_Y == 8'd24) ||

(screen\_X == 9'd264 && screen\_Y == 8'd24)

) begin // g

pixel\_colour = colourful ? ((randNum\_12b[9:7] == 3'b0) ? 3'b111 : randNum\_12b[9:7]) : 3'b111;

end

if ((screen\_X == 9'd267 && screen\_Y == 8'd8) ||

(screen\_X == 9'd268 && screen\_Y == 8'd8) ||

(screen\_X == 9'd268 && screen\_Y == 8'd9) ||

(screen\_X == 9'd268 && screen\_Y == 8'd10) ||

(screen\_X == 9'd268 && screen\_Y == 8'd11) ||

(screen\_X == 9'd268 && screen\_Y == 8'd12) ||

(screen\_X == 9'd268 && screen\_Y == 8'd13) ||

(screen\_X == 9'd268 && screen\_Y == 8'd14) ||

(screen\_X == 9'd268 && screen\_Y == 8'd15) ||

(screen\_X == 9'd268 && screen\_Y == 8'd16) ||

(screen\_X == 9'd268 && screen\_Y == 8'd17) ||

(screen\_X == 9'd268 && screen\_Y == 8'd18) ||

(screen\_X == 9'd268 && screen\_Y == 8'd19) ||

(screen\_X == 9'd269 && screen\_Y == 8'd13) ||

(screen\_X == 9'd270 && screen\_Y == 8'd13) ||

(screen\_X == 9'd271 && screen\_Y == 8'd13) ||

(screen\_X == 9'd272 && screen\_Y == 8'd13) ||

(screen\_X == 9'd272 && screen\_Y == 8'd14) ||

(screen\_X == 9'd272 && screen\_Y == 8'd15) ||

(screen\_X == 9'd272 && screen\_Y == 8'd16) ||

(screen\_X == 9'd272 && screen\_Y == 8'd17) ||

(screen\_X == 9'd272 && screen\_Y == 8'd18)

) begin // h

pixel\_colour = colourful ? ((randNum\_12b[8:6] == 3'b0) ? 3'b111 : randNum\_12b[8:6]) : 3'b111;

end

if ((screen\_X == 9'd276 && screen\_Y == 8'd12) ||

(screen\_X == 9'd277 && screen\_Y == 8'd12) ||

(screen\_X == 9'd278 && screen\_Y == 8'd12) ||

(screen\_X == 9'd279 && screen\_Y == 8'd12) ||

(screen\_X == 9'd280 && screen\_Y == 8'd12) ||

(screen\_X == 9'd281 && screen\_Y == 8'd12) ||

(screen\_X == 9'd276 && screen\_Y == 8'd13) ||

(screen\_X == 9'd276 && screen\_Y == 8'd14) ||

(screen\_X == 9'd276 && screen\_Y == 8'd15) ||

(screen\_X == 9'd276 && screen\_Y == 8'd16) ||

(screen\_X == 9'd276 && screen\_Y == 8'd17) ||

(screen\_X == 9'd276 && screen\_Y == 8'd18) ||

(screen\_X == 9'd276 && screen\_Y == 8'd19) ||

(screen\_X == 9'd277 && screen\_Y == 8'd15) ||

(screen\_X == 9'd278 && screen\_Y == 8'd15) ||

(screen\_X == 9'd279 && screen\_Y == 8'd15) ||

(screen\_X == 9'd280 && screen\_Y == 8'd15) ||

(screen\_X == 9'd281 && screen\_Y == 8'd15) ||

(screen\_X == 9'd282 && screen\_Y == 8'd15) ||

(screen\_X == 9'd277 && screen\_Y == 8'd19) ||

(screen\_X == 9'd278 && screen\_Y == 8'd19) ||

(screen\_X == 9'd279 && screen\_Y == 8'd19) ||

(screen\_X == 9'd280 && screen\_Y == 8'd19) ||

(screen\_X == 9'd281 && screen\_Y == 8'd19) ||

(screen\_X == 9'd282 && screen\_Y == 8'd19) ||

(screen\_X == 9'd281 && screen\_Y == 8'd13) ||

(screen\_X == 9'd282 && screen\_Y == 8'd13) ||

(screen\_X == 9'd282 && screen\_Y == 8'd14)

) begin // e

pixel\_colour = colourful ? ((randNum\_12b[7:5] == 3'b0) ? 3'b111 : randNum\_12b[7:5]) : 3'b111;

end

if ((screen\_X == 9'd286 && screen\_Y == 8'd13) ||

(screen\_X == 9'd287 && screen\_Y == 8'd13) ||

(screen\_X == 9'd288 && screen\_Y == 8'd13) ||

(screen\_X == 9'd289 && screen\_Y == 8'd13) ||

(screen\_X == 9'd290 && screen\_Y == 8'd13) ||

(screen\_X == 9'd291 && screen\_Y == 8'd13) ||

(screen\_X == 9'd292 && screen\_Y == 8'd13) ||

(screen\_X == 9'd293 && screen\_Y == 8'd13) ||

(screen\_X == 9'd286 && screen\_Y == 8'd14) ||

(screen\_X == 9'd286 && screen\_Y == 8'd15) ||

(screen\_X == 9'd286 && screen\_Y == 8'd16) ||

(screen\_X == 9'd286 && screen\_Y == 8'd17) ||

(screen\_X == 9'd287 && screen\_Y == 8'd17) ||

(screen\_X == 9'd288 && screen\_Y == 8'd17) ||

(screen\_X == 9'd289 && screen\_Y == 8'd17) ||

(screen\_X == 9'd290 && screen\_Y == 8'd17) ||

(screen\_X == 9'd291 && screen\_Y == 8'd17) ||

(screen\_X == 9'd292 && screen\_Y == 8'd17) ||

(screen\_X == 9'd293 && screen\_Y == 8'd17) ||

(screen\_X == 9'd293 && screen\_Y == 8'd18) ||

(screen\_X == 9'd293 && screen\_Y == 8'd19) ||

(screen\_X == 9'd287 && screen\_Y == 8'd20) ||

(screen\_X == 9'd288 && screen\_Y == 8'd20) ||

(screen\_X == 9'd289 && screen\_Y == 8'd20) ||

(screen\_X == 9'd290 && screen\_Y == 8'd20) ||

(screen\_X == 9'd291 && screen\_Y == 8'd20) ||

(screen\_X == 9'd292 && screen\_Y == 8'd20) ||

(screen\_X == 9'd293 && screen\_Y == 8'd20)

) begin // s

pixel\_colour = colourful ? ((randNum\_12b[6:4] == 3'b0) ? 3'b111 : randNum\_12b[6:4]) : 3'b111;

end

if ((screen\_X == 9'd295 && screen\_Y == 8'd10) ||

(screen\_X == 9'd296 && screen\_Y == 8'd10) ||

(screen\_X == 9'd297 && screen\_Y == 8'd10) ||

(screen\_X == 9'd298 && screen\_Y == 8'd10) ||

(screen\_X == 9'd299 && screen\_Y == 8'd10) ||

(screen\_X == 9'd300 && screen\_Y == 8'd10) ||

(screen\_X == 9'd301 && screen\_Y == 8'd10) ||

(screen\_X == 9'd302 && screen\_Y == 8'd10) ||

(screen\_X == 9'd303 && screen\_Y == 8'd10) ||

(screen\_X == 9'd304 && screen\_Y == 8'd10) ||

(screen\_X == 9'd305 && screen\_Y == 8'd10) ||

(screen\_X == 9'd300 && screen\_Y == 8'd11) ||

(screen\_X == 9'd300 && screen\_Y == 8'd12) ||

(screen\_X == 9'd300 && screen\_Y == 8'd13) ||

(screen\_X == 9'd300 && screen\_Y == 8'd14) ||

(screen\_X == 9'd300 && screen\_Y == 8'd15) ||

(screen\_X == 9'd300 && screen\_Y == 8'd16) ||

(screen\_X == 9'd300 && screen\_Y == 8'd17) ||

(screen\_X == 9'd300 && screen\_Y == 8'd18) ||

(screen\_X == 9'd300 && screen\_Y == 8'd19) ||

(screen\_X == 9'd300 && screen\_Y == 8'd20) ||

(screen\_X == 9'd300 && screen\_Y == 8'd21)

) begin // t

pixel\_colour = colourful ? ((randNum\_12b[5:3] == 3'b0) ? 3'b111 : randNum\_12b[5:3]) : 3'b111;

end

if ((screen\_X == 9'd258 && screen\_Y == 8'd29) ||

(screen\_X == 9'd256 && screen\_Y == 8'd30) ||

(screen\_X == 9'd257 && screen\_Y == 8'd30) ||

(screen\_X == 9'd255 && screen\_Y == 8'd31) ||

(screen\_X == 9'd255 && screen\_Y == 8'd32) ||

(screen\_X == 9'd255 && screen\_Y == 8'd33) ||

(screen\_X == 9'd255 && screen\_Y == 8'd34) ||

(screen\_X == 9'd256 && screen\_Y == 8'd35) ||

(screen\_X == 9'd256 && screen\_Y == 8'd36) ||

(screen\_X == 9'd256 && screen\_Y == 8'd37) ||

(screen\_X == 9'd257 && screen\_Y == 8'd38) ||

(screen\_X == 9'd257 && screen\_Y == 8'd39) ||

(screen\_X == 9'd258 && screen\_Y == 8'd40) ||

(screen\_X == 9'd258 && screen\_Y == 8'd41) ||

(screen\_X == 9'd259 && screen\_Y == 8'd41) ||

(screen\_X == 9'd259 && screen\_Y == 8'd42) ||

(screen\_X == 9'd260 && screen\_Y == 8'd42) ||

(screen\_X == 9'd254 && screen\_Y == 8'd42) ||

(screen\_X == 9'd255 && screen\_Y == 8'd42) ||

(screen\_X == 9'd256 && screen\_Y == 8'd42) ||

(screen\_X == 9'd257 && screen\_Y == 8'd43) ||

(screen\_X == 9'd258 && screen\_Y == 8'd43) ||

(screen\_X == 9'd259 && screen\_Y == 8'd43) ||

(screen\_X == 9'd260 && screen\_Y == 8'd43) ||

(screen\_X == 9'd261 && screen\_Y == 8'd43) ||

(screen\_X == 9'd261 && screen\_Y == 8'd38) ||

(screen\_X == 9'd261 && screen\_Y == 8'd39) ||

(screen\_X == 9'd261 && screen\_Y == 8'd40) ||

(screen\_X == 9'd261 && screen\_Y == 8'd41) ||

(screen\_X == 9'd261 && screen\_Y == 8'd42)

) begin // arrow

pixel\_colour = colourful ? ((randNum\_12b[4:3] == 3'b0) ? 3'b111 : randNum\_12b[4:3]) : 3'b111;

end

if ((screen\_X == 9'd273 && screen\_Y == 8'd29) ||

(screen\_X == 9'd274 && screen\_Y == 8'd29) ||

(screen\_X == 9'd275 && screen\_Y == 8'd29) ||

(screen\_X == 9'd276 && screen\_Y == 8'd29) ||

(screen\_X == 9'd277 && screen\_Y == 8'd29) ||

(screen\_X == 9'd278 && screen\_Y == 8'd29) ||

(screen\_X == 9'd279 && screen\_Y == 8'd29) ||

(screen\_X == 9'd280 && screen\_Y == 8'd29) ||

(screen\_X == 9'd281 && screen\_Y == 8'd29) ||

(screen\_X == 9'd281 && screen\_Y == 8'd30) ||

(screen\_X == 9'd281 && screen\_Y == 8'd31) ||

(screen\_X == 9'd281 && screen\_Y == 8'd36) ||

(screen\_X == 9'd281 && screen\_Y == 8'd37) ||

(screen\_X == 9'd281 && screen\_Y == 8'd38) ||

(screen\_X == 9'd281 && screen\_Y == 8'd39) ||

(screen\_X == 9'd281 && screen\_Y == 8'd40) ||

(screen\_X == 9'd281 && screen\_Y == 8'd41) ||

(screen\_X == 9'd273 && screen\_Y == 8'd30) ||

(screen\_X == 9'd273 && screen\_Y == 8'd31) ||

(screen\_X == 9'd273 && screen\_Y == 8'd32) ||

(screen\_X == 9'd273 && screen\_Y == 8'd33) ||

(screen\_X == 9'd273 && screen\_Y == 8'd34) ||

(screen\_X == 9'd273 && screen\_Y == 8'd35) ||

(screen\_X == 9'd274 && screen\_Y == 8'd35) ||

(screen\_X == 9'd275 && screen\_Y == 8'd35) ||

(screen\_X == 9'd276 && screen\_Y == 8'd35) ||

(screen\_X == 9'd277 && screen\_Y == 8'd35) ||

(screen\_X == 9'd278 && screen\_Y == 8'd35) ||

(screen\_X == 9'd279 && screen\_Y == 8'd35) ||

(screen\_X == 9'd280 && screen\_Y == 8'd35) ||

(screen\_X == 9'd281 && screen\_Y == 8'd35) ||

(screen\_X == 9'd272 && screen\_Y == 8'd39) ||

(screen\_X == 9'd272 && screen\_Y == 8'd40) ||

(screen\_X == 9'd272 && screen\_Y == 8'd41) ||

(screen\_X == 9'd273 && screen\_Y == 8'd41) ||

(screen\_X == 9'd274 && screen\_Y == 8'd41) ||

(screen\_X == 9'd275 && screen\_Y == 8'd41) ||

(screen\_X == 9'd276 && screen\_Y == 8'd41) ||

(screen\_X == 9'd277 && screen\_Y == 8'd41) ||

(screen\_X == 9'd278 && screen\_Y == 8'd41) ||

(screen\_X == 9'd279 && screen\_Y == 8'd41) ||

(screen\_X == 9'd280 && screen\_Y == 8'd41)

) begin // S

pixel\_colour = colourful ? ((randNum\_12b[3:1] == 3'b0) ? 3'b111 : randNum\_12b[3:1]) : 3'b111;

end

if ((screen\_X == 9'd283 && screen\_Y == 8'd32) ||

(screen\_X == 9'd284 && screen\_Y == 8'd32) ||

(screen\_X == 9'd285 && screen\_Y == 8'd32) ||

(screen\_X == 9'd286 && screen\_Y == 8'd32) ||

(screen\_X == 9'd287 && screen\_Y == 8'd32) ||

(screen\_X == 9'd288 && screen\_Y == 8'd32) ||

(screen\_X == 9'd288 && screen\_Y == 8'd33) ||

(screen\_X == 9'd283 && screen\_Y == 8'd33) ||

(screen\_X == 9'd283 && screen\_Y == 8'd34) ||

(screen\_X == 9'd283 && screen\_Y == 8'd35) ||

(screen\_X == 9'd283 && screen\_Y == 8'd36) ||

(screen\_X == 9'd283 && screen\_Y == 8'd37) ||

(screen\_X == 9'd283 && screen\_Y == 8'd38) ||

(screen\_X == 9'd283 && screen\_Y == 8'd39) ||

(screen\_X == 9'd284 && screen\_Y == 8'd39) ||

(screen\_X == 9'd285 && screen\_Y == 8'd39) ||

(screen\_X == 9'd286 && screen\_Y == 8'd39) ||

(screen\_X == 9'd287 && screen\_Y == 8'd39) ||

(screen\_X == 9'd288 && screen\_Y == 8'd39)

) begin // c

pixel\_colour = colourful ? ((randNum\_12b[2:0] == 3'b0) ? 3'b111 : randNum\_12b[2:0]) : 3'b111;

end

if ((screen\_X == 9'd291 && screen\_Y == 8'd32) ||

(screen\_X == 9'd292 && screen\_Y == 8'd32) ||

(screen\_X == 9'd293 && screen\_Y == 8'd32) ||

(screen\_X == 9'd294 && screen\_Y == 8'd32) ||

(screen\_X == 9'd295 && screen\_Y == 8'd32) ||

(screen\_X == 9'd296 && screen\_Y == 8'd32) ||

(screen\_X == 9'd297 && screen\_Y == 8'd32) ||

(screen\_X == 9'd292 && screen\_Y == 8'd39) ||

(screen\_X == 9'd293 && screen\_Y == 8'd39) ||

(screen\_X == 9'd294 && screen\_Y == 8'd39) ||

(screen\_X == 9'd295 && screen\_Y == 8'd39) ||

(screen\_X == 9'd296 && screen\_Y == 8'd39) ||

(screen\_X == 9'd291 && screen\_Y == 8'd33) ||

(screen\_X == 9'd291 && screen\_Y == 8'd34) ||

(screen\_X == 9'd291 && screen\_Y == 8'd35) ||

(screen\_X == 9'd291 && screen\_Y == 8'd36) ||

(screen\_X == 9'd291 && screen\_Y == 8'd37) ||

(screen\_X == 9'd291 && screen\_Y == 8'd38) ||

(screen\_X == 9'd291 && screen\_Y == 8'd39) ||

(screen\_X == 9'd297 && screen\_Y == 8'd33) ||

(screen\_X == 9'd297 && screen\_Y == 8'd34) ||

(screen\_X == 9'd297 && screen\_Y == 8'd35) ||

(screen\_X == 9'd297 && screen\_Y == 8'd36) ||

(screen\_X == 9'd297 && screen\_Y == 8'd37) ||

(screen\_X == 9'd297 && screen\_Y == 8'd38) ||

(screen\_X == 9'd297 && screen\_Y == 8'd39) ||

(screen\_X == 9'd297 && screen\_Y == 8'd40)

) begin // o

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[2:0]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[2:0])) : 3'b111;

end

if ((screen\_X == 9'd300 && screen\_Y == 8'd33) ||

(screen\_X == 9'd300 && screen\_Y == 8'd34) ||

(screen\_X == 9'd300 && screen\_Y == 8'd35) ||

(screen\_X == 9'd300 && screen\_Y == 8'd36) ||

(screen\_X == 9'd300 && screen\_Y == 8'd37) ||

(screen\_X == 9'd300 && screen\_Y == 8'd38) ||

(screen\_X == 9'd300 && screen\_Y == 8'd39) ||

(screen\_X == 9'd301 && screen\_Y == 8'd34) ||

(screen\_X == 9'd302 && screen\_Y == 8'd33) ||

(screen\_X == 9'd303 && screen\_Y == 8'd33) ||

(screen\_X == 9'd304 && screen\_Y == 8'd33) ||

(screen\_X == 9'd305 && screen\_Y == 8'd33) ||

(screen\_X == 9'd306 && screen\_Y == 8'd33)

) begin // r

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[2:0]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[2:0])) : 3'b111;

end

if ((screen\_X == 9'd310 && screen\_Y == 8'd32) ||

(screen\_X == 9'd311 && screen\_Y == 8'd32) ||

(screen\_X == 9'd312 && screen\_Y == 8'd32) ||

(screen\_X == 9'd313 && screen\_Y == 8'd32) ||

(screen\_X == 9'd314 && screen\_Y == 8'd33) ||

(screen\_X == 9'd314 && screen\_Y == 8'd34) ||

(screen\_X == 9'd315 && screen\_Y == 8'd34) ||

(screen\_X == 9'd315 && screen\_Y == 8'd35) ||

(screen\_X == 9'd315 && screen\_Y == 8'd36) ||

(screen\_X == 9'd310 && screen\_Y == 8'd37) ||

(screen\_X == 9'd311 && screen\_Y == 8'd37) ||

(screen\_X == 9'd312 && screen\_Y == 8'd37) ||

(screen\_X == 9'd313 && screen\_Y == 8'd37) ||

(screen\_X == 9'd314 && screen\_Y == 8'd37) ||

(screen\_X == 9'd315 && screen\_Y == 8'd37) ||

(screen\_X == 9'd311 && screen\_Y == 8'd41) ||

(screen\_X == 9'd312 && screen\_Y == 8'd41) ||

(screen\_X == 9'd313 && screen\_Y == 8'd41) ||

(screen\_X == 9'd314 && screen\_Y == 8'd41) ||

(screen\_X == 9'd315 && screen\_Y == 8'd41) ||

(screen\_X == 9'd310 && screen\_Y == 8'd40) ||

(screen\_X == 9'd309 && screen\_Y == 8'd33) ||

(screen\_X == 9'd309 && screen\_Y == 8'd34) ||

(screen\_X == 9'd309 && screen\_Y == 8'd35) ||

(screen\_X == 9'd309 && screen\_Y == 8'd36) ||

(screen\_X == 9'd309 && screen\_Y == 8'd37) ||

(screen\_X == 9'd309 && screen\_Y == 8'd38) ||

(screen\_X == 9'd309 && screen\_Y == 8'd39)

) begin // e

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[3:1]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[3:1])) : 3'b111;

end

if ((screen\_X == 9'd251 && screen\_Y == 8'd50) ||

(screen\_X == 9'd252 && screen\_Y == 8'd50) ||

(screen\_X == 9'd253 && screen\_Y == 8'd50) ||

(screen\_X == 9'd254 && screen\_Y == 8'd50) ||

(screen\_X == 9'd255 && screen\_Y == 8'd50) ||

(screen\_X == 9'd256 && screen\_Y == 8'd50) ||

(screen\_X == 9'd257 && screen\_Y == 8'd50) ||

(screen\_X == 9'd258 && screen\_Y == 8'd50) ||

(screen\_X == 9'd259 && screen\_Y == 8'd50) ||

(screen\_X == 9'd260 && screen\_Y == 8'd50) ||

(screen\_X == 9'd261 && screen\_Y == 8'd50) ||

(screen\_X == 9'd262 && screen\_Y == 8'd50) ||

(screen\_X == 9'd263 && screen\_Y == 8'd50) ||

(screen\_X == 9'd264 && screen\_Y == 8'd50) ||

(screen\_X == 9'd265 && screen\_Y == 8'd50) ||

(screen\_X == 9'd266 && screen\_Y == 8'd50) ||

(screen\_X == 9'd267 && screen\_Y == 8'd50) ||

(screen\_X == 9'd268 && screen\_Y == 8'd50) ||

(screen\_X == 9'd269 && screen\_Y == 8'd50) ||

(screen\_X == 9'd270 && screen\_Y == 8'd50) ||

(screen\_X == 9'd271 && screen\_Y == 8'd50) ||

(screen\_X == 9'd272 && screen\_Y == 8'd50) ||

(screen\_X == 9'd273 && screen\_Y == 8'd50) ||

(screen\_X == 9'd274 && screen\_Y == 8'd50) ||

(screen\_X == 9'd275 && screen\_Y == 8'd50) ||

(screen\_X == 9'd276 && screen\_Y == 8'd50) ||

(screen\_X == 9'd277 && screen\_Y == 8'd50) ||

(screen\_X == 9'd278 && screen\_Y == 8'd50) ||

(screen\_X == 9'd279 && screen\_Y == 8'd50) ||

(screen\_X == 9'd280 && screen\_Y == 8'd50) ||

(screen\_X == 9'd281 && screen\_Y == 8'd50) ||

(screen\_X == 9'd282 && screen\_Y == 8'd50) ||

(screen\_X == 9'd283 && screen\_Y == 8'd50) ||

(screen\_X == 9'd284 && screen\_Y == 8'd50) ||

(screen\_X == 9'd285 && screen\_Y == 8'd50) ||

(screen\_X == 9'd286 && screen\_Y == 8'd50) ||

(screen\_X == 9'd287 && screen\_Y == 8'd50) ||

(screen\_X == 9'd288 && screen\_Y == 8'd50) ||

(screen\_X == 9'd289 && screen\_Y == 8'd50) ||

(screen\_X == 9'd290 && screen\_Y == 8'd50) ||

(screen\_X == 9'd291 && screen\_Y == 8'd50) ||

(screen\_X == 9'd292 && screen\_Y == 8'd50) ||

(screen\_X == 9'd293 && screen\_Y == 8'd50) ||

(screen\_X == 9'd294 && screen\_Y == 8'd50) ||

(screen\_X == 9'd295 && screen\_Y == 8'd50) ||

(screen\_X == 9'd296 && screen\_Y == 8'd50) ||

(screen\_X == 9'd297 && screen\_Y == 8'd50) ||

(screen\_X == 9'd298 && screen\_Y == 8'd50) ||

(screen\_X == 9'd299 && screen\_Y == 8'd50) ||

(screen\_X == 9'd300 && screen\_Y == 8'd50) ||

(screen\_X == 9'd301 && screen\_Y == 8'd50) ||

(screen\_X == 9'd302 && screen\_Y == 8'd50) ||

(screen\_X == 9'd303 && screen\_Y == 8'd50) ||

(screen\_X == 9'd304 && screen\_Y == 8'd50) ||

(screen\_X == 9'd305 && screen\_Y == 8'd50) ||

(screen\_X == 9'd306 && screen\_Y == 8'd50) ||

(screen\_X == 9'd307 && screen\_Y == 8'd50) ||

(screen\_X == 9'd308 && screen\_Y == 8'd50) ||

(screen\_X == 9'd309 && screen\_Y == 8'd50) ||

(screen\_X == 9'd251 && screen\_Y == 8'd108) ||

(screen\_X == 9'd252 && screen\_Y == 8'd108) ||

(screen\_X == 9'd253 && screen\_Y == 8'd108) ||

(screen\_X == 9'd254 && screen\_Y == 8'd108) ||

(screen\_X == 9'd255 && screen\_Y == 8'd108) ||

(screen\_X == 9'd256 && screen\_Y == 8'd108) ||

(screen\_X == 9'd257 && screen\_Y == 8'd108) ||

(screen\_X == 9'd258 && screen\_Y == 8'd108) ||

(screen\_X == 9'd259 && screen\_Y == 8'd108) ||

(screen\_X == 9'd260 && screen\_Y == 8'd108) ||

(screen\_X == 9'd261 && screen\_Y == 8'd108) ||

(screen\_X == 9'd262 && screen\_Y == 8'd108) ||

(screen\_X == 9'd263 && screen\_Y == 8'd108) ||

(screen\_X == 9'd264 && screen\_Y == 8'd108) ||

(screen\_X == 9'd265 && screen\_Y == 8'd108) ||

(screen\_X == 9'd266 && screen\_Y == 8'd108) ||

(screen\_X == 9'd267 && screen\_Y == 8'd108) ||

(screen\_X == 9'd268 && screen\_Y == 8'd108) ||

(screen\_X == 9'd269 && screen\_Y == 8'd108) ||

(screen\_X == 9'd270 && screen\_Y == 8'd108) ||

(screen\_X == 9'd271 && screen\_Y == 8'd108) ||

(screen\_X == 9'd272 && screen\_Y == 8'd108) ||

(screen\_X == 9'd273 && screen\_Y == 8'd108) ||

(screen\_X == 9'd274 && screen\_Y == 8'd108) ||

(screen\_X == 9'd275 && screen\_Y == 8'd108) ||

(screen\_X == 9'd276 && screen\_Y == 8'd108) ||

(screen\_X == 9'd277 && screen\_Y == 8'd108) ||

(screen\_X == 9'd278 && screen\_Y == 8'd108) ||

(screen\_X == 9'd279 && screen\_Y == 8'd108) ||

(screen\_X == 9'd280 && screen\_Y == 8'd108) ||

(screen\_X == 9'd281 && screen\_Y == 8'd108) ||

(screen\_X == 9'd282 && screen\_Y == 8'd108) ||

(screen\_X == 9'd283 && screen\_Y == 8'd108) ||

(screen\_X == 9'd284 && screen\_Y == 8'd108) ||

(screen\_X == 9'd285 && screen\_Y == 8'd108) ||

(screen\_X == 9'd286 && screen\_Y == 8'd108) ||

(screen\_X == 9'd287 && screen\_Y == 8'd108) ||

(screen\_X == 9'd288 && screen\_Y == 8'd108) ||

(screen\_X == 9'd289 && screen\_Y == 8'd108) ||

(screen\_X == 9'd290 && screen\_Y == 8'd108) ||

(screen\_X == 9'd291 && screen\_Y == 8'd108) ||

(screen\_X == 9'd292 && screen\_Y == 8'd108) ||

(screen\_X == 9'd293 && screen\_Y == 8'd108) ||

(screen\_X == 9'd294 && screen\_Y == 8'd108) ||

(screen\_X == 9'd295 && screen\_Y == 8'd108) ||

(screen\_X == 9'd296 && screen\_Y == 8'd108) ||

(screen\_X == 9'd297 && screen\_Y == 8'd108) ||

(screen\_X == 9'd298 && screen\_Y == 8'd108) ||

(screen\_X == 9'd299 && screen\_Y == 8'd108) ||

(screen\_X == 9'd300 && screen\_Y == 8'd108) ||

(screen\_X == 9'd301 && screen\_Y == 8'd108) ||

(screen\_X == 9'd302 && screen\_Y == 8'd108) ||

(screen\_X == 9'd303 && screen\_Y == 8'd108) ||

(screen\_X == 9'd304 && screen\_Y == 8'd108) ||

(screen\_X == 9'd305 && screen\_Y == 8'd108) ||

(screen\_X == 9'd306 && screen\_Y == 8'd108) ||

(screen\_X == 9'd307 && screen\_Y == 8'd108) ||

(screen\_X == 9'd308 && screen\_Y == 8'd108) ||

(screen\_X == 9'd309 && screen\_Y == 8'd108) ||

(screen\_X == 9'd251 && screen\_Y == 8'd51) ||

(screen\_X == 9'd251 && screen\_Y == 8'd52) ||

(screen\_X == 9'd251 && screen\_Y == 8'd53) ||

(screen\_X == 9'd251 && screen\_Y == 8'd54) ||

(screen\_X == 9'd251 && screen\_Y == 8'd55) ||

(screen\_X == 9'd251 && screen\_Y == 8'd56) ||

(screen\_X == 9'd251 && screen\_Y == 8'd57) ||

(screen\_X == 9'd251 && screen\_Y == 8'd58) ||

(screen\_X == 9'd251 && screen\_Y == 8'd59) ||

(screen\_X == 9'd251 && screen\_Y == 8'd60) ||

(screen\_X == 9'd251 && screen\_Y == 8'd61) ||

(screen\_X == 9'd251 && screen\_Y == 8'd62) ||

(screen\_X == 9'd251 && screen\_Y == 8'd63) ||

(screen\_X == 9'd251 && screen\_Y == 8'd64) ||

(screen\_X == 9'd251 && screen\_Y == 8'd65) ||

(screen\_X == 9'd251 && screen\_Y == 8'd66) ||

(screen\_X == 9'd251 && screen\_Y == 8'd67) ||

(screen\_X == 9'd251 && screen\_Y == 8'd68) ||

(screen\_X == 9'd251 && screen\_Y == 8'd69) ||

(screen\_X == 9'd251 && screen\_Y == 8'd70) ||

(screen\_X == 9'd251 && screen\_Y == 8'd71) ||

(screen\_X == 9'd251 && screen\_Y == 8'd72) ||

(screen\_X == 9'd251 && screen\_Y == 8'd73) ||

(screen\_X == 9'd251 && screen\_Y == 8'd74) ||

(screen\_X == 9'd251 && screen\_Y == 8'd75) ||

(screen\_X == 9'd251 && screen\_Y == 8'd76) ||

(screen\_X == 9'd251 && screen\_Y == 8'd77) ||

(screen\_X == 9'd251 && screen\_Y == 8'd78) ||

(screen\_X == 9'd251 && screen\_Y == 8'd79) ||

(screen\_X == 9'd251 && screen\_Y == 8'd80) ||

(screen\_X == 9'd251 && screen\_Y == 8'd81) ||

(screen\_X == 9'd251 && screen\_Y == 8'd82) ||

(screen\_X == 9'd251 && screen\_Y == 8'd83) ||

(screen\_X == 9'd251 && screen\_Y == 8'd84) ||

(screen\_X == 9'd251 && screen\_Y == 8'd85) ||

(screen\_X == 9'd251 && screen\_Y == 8'd86) ||

(screen\_X == 9'd251 && screen\_Y == 8'd87) ||

(screen\_X == 9'd251 && screen\_Y == 8'd88) ||

(screen\_X == 9'd251 && screen\_Y == 8'd89) ||

(screen\_X == 9'd251 && screen\_Y == 8'd90) ||

(screen\_X == 9'd251 && screen\_Y == 8'd91) ||

(screen\_X == 9'd251 && screen\_Y == 8'd92) ||

(screen\_X == 9'd251 && screen\_Y == 8'd93) ||

(screen\_X == 9'd251 && screen\_Y == 8'd94) ||

(screen\_X == 9'd251 && screen\_Y == 8'd95) ||

(screen\_X == 9'd251 && screen\_Y == 8'd96) ||

(screen\_X == 9'd251 && screen\_Y == 8'd97) ||

(screen\_X == 9'd251 && screen\_Y == 8'd98) ||

(screen\_X == 9'd251 && screen\_Y == 8'd99) ||

(screen\_X == 9'd251 && screen\_Y == 8'd100) ||

(screen\_X == 9'd251 && screen\_Y == 8'd101) ||

(screen\_X == 9'd251 && screen\_Y == 8'd102) ||

(screen\_X == 9'd251 && screen\_Y == 8'd103) ||

(screen\_X == 9'd251 && screen\_Y == 8'd104) ||

(screen\_X == 9'd251 && screen\_Y == 8'd105) ||

(screen\_X == 9'd251 && screen\_Y == 8'd106) ||

(screen\_X == 9'd251 && screen\_Y == 8'd107) ||

(screen\_X == 9'd309 && screen\_Y == 8'd51) ||

(screen\_X == 9'd309 && screen\_Y == 8'd52) ||

(screen\_X == 9'd309 && screen\_Y == 8'd53) ||

(screen\_X == 9'd309 && screen\_Y == 8'd54) ||

(screen\_X == 9'd309 && screen\_Y == 8'd55) ||

(screen\_X == 9'd309 && screen\_Y == 8'd56) ||

(screen\_X == 9'd309 && screen\_Y == 8'd57) ||

(screen\_X == 9'd309 && screen\_Y == 8'd58) ||

(screen\_X == 9'd309 && screen\_Y == 8'd59) ||

(screen\_X == 9'd309 && screen\_Y == 8'd60) ||

(screen\_X == 9'd309 && screen\_Y == 8'd61) ||

(screen\_X == 9'd309 && screen\_Y == 8'd62) ||

(screen\_X == 9'd309 && screen\_Y == 8'd63) ||

(screen\_X == 9'd309 && screen\_Y == 8'd64) ||

(screen\_X == 9'd309 && screen\_Y == 8'd65) ||

(screen\_X == 9'd309 && screen\_Y == 8'd66) ||

(screen\_X == 9'd309 && screen\_Y == 8'd67) ||

(screen\_X == 9'd309 && screen\_Y == 8'd68) ||

(screen\_X == 9'd309 && screen\_Y == 8'd69) ||

(screen\_X == 9'd309 && screen\_Y == 8'd70) ||

(screen\_X == 9'd309 && screen\_Y == 8'd71) ||

(screen\_X == 9'd309 && screen\_Y == 8'd72) ||

(screen\_X == 9'd309 && screen\_Y == 8'd73) ||

(screen\_X == 9'd309 && screen\_Y == 8'd74) ||

(screen\_X == 9'd309 && screen\_Y == 8'd75) ||

(screen\_X == 9'd309 && screen\_Y == 8'd76) ||

(screen\_X == 9'd309 && screen\_Y == 8'd77) ||

(screen\_X == 9'd309 && screen\_Y == 8'd78) ||

(screen\_X == 9'd309 && screen\_Y == 8'd79) ||

(screen\_X == 9'd309 && screen\_Y == 8'd80) ||

(screen\_X == 9'd309 && screen\_Y == 8'd81) ||

(screen\_X == 9'd309 && screen\_Y == 8'd82) ||

(screen\_X == 9'd309 && screen\_Y == 8'd83) ||

(screen\_X == 9'd309 && screen\_Y == 8'd84) ||

(screen\_X == 9'd309 && screen\_Y == 8'd85) ||

(screen\_X == 9'd309 && screen\_Y == 8'd86) ||

(screen\_X == 9'd309 && screen\_Y == 8'd87) ||

(screen\_X == 9'd309 && screen\_Y == 8'd88) ||

(screen\_X == 9'd309 && screen\_Y == 8'd89) ||

(screen\_X == 9'd309 && screen\_Y == 8'd90) ||

(screen\_X == 9'd309 && screen\_Y == 8'd91) ||

(screen\_X == 9'd309 && screen\_Y == 8'd92) ||

(screen\_X == 9'd309 && screen\_Y == 8'd93) ||

(screen\_X == 9'd309 && screen\_Y == 8'd94) ||

(screen\_X == 9'd309 && screen\_Y == 8'd95) ||

(screen\_X == 9'd309 && screen\_Y == 8'd96) ||

(screen\_X == 9'd309 && screen\_Y == 8'd97) ||

(screen\_X == 9'd309 && screen\_Y == 8'd98) ||

(screen\_X == 9'd309 && screen\_Y == 8'd99) ||

(screen\_X == 9'd309 && screen\_Y == 8'd100) ||

(screen\_X == 9'd309 && screen\_Y == 8'd101) ||

(screen\_X == 9'd309 && screen\_Y == 8'd102) ||

(screen\_X == 9'd309 && screen\_Y == 8'd103) ||

(screen\_X == 9'd309 && screen\_Y == 8'd104) ||

(screen\_X == 9'd309 && screen\_Y == 8'd105) ||

(screen\_X == 9'd309 && screen\_Y == 8'd106) ||

(screen\_X == 9'd309 && screen\_Y == 8'd107)

) begin // box border

pixel\_colour = colourful ? (((randNum\_12b[6:4] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[6:4] ^ randNum\_12b[4:2])) : 3'b111;

end

if (screen\_X >= 9'd252 && screen\_X <= 9'd308 && screen\_Y >= 8'd50 && screen\_Y <= 8'd106) begin

effective\_X = screen\_X - 9'd252;

effective\_Y = screen\_Y - 8'd51;

if (highscore == 12'd0) begin

end

if (highscore == 12'd2) begin

if((effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[7:5] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[7:5] ^ randNum\_12b[4:2])) : 3'b111;

end

end

if (highscore == 12'd4) begin

if((effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) ||

(effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) ||

(effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) ||

(effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) ||

(effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) ||

(effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) ||

(effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) ||

(effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) ||

(effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[4:2])) : 3'b111;

end

end

if (highscore == 12'd8) begin

if((effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[3:1]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[3:1])) : 3'b111;

end

end

if (highscore == 12'd16) begin

if((effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38)||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38)||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38)||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38)||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38)||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38)||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38)||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38)||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38)||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38)||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38)||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38)||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[6:4] ^ randNum\_12b[7:5]) == 3'b0) ? 3'b111 : (randNum\_12b[6:4] ^ randNum\_12b[7:5])) : 3'b111;

end

end

if (highscore == 12'd32) begin

if((effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) || (effective\_X == 9'd29 && effective\_Y == 8'd37) || (effective\_X == 9'd29 && effective\_Y == 8'd38) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) || (effective\_X == 9'd30 && effective\_Y == 8'd37) || (effective\_X == 9'd30 && effective\_Y == 8'd38) ||

(effective\_X == 9'd31 && effective\_Y == 8'd18) || (effective\_X == 9'd31 && effective\_Y == 8'd19) || (effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) || (effective\_X == 9'd31 && effective\_Y == 8'd37) || (effective\_X == 9'd31 && effective\_Y == 8'd38) ||

(effective\_X == 9'd32 && effective\_Y == 8'd18) || (effective\_X == 9'd32 && effective\_Y == 8'd19) || (effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) || (effective\_X == 9'd32 && effective\_Y == 8'd37) || (effective\_X == 9'd32 && effective\_Y == 8'd38) ||

(effective\_X == 9'd33 && effective\_Y == 8'd18) || (effective\_X == 9'd33 && effective\_Y == 8'd19) || (effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) || (effective\_X == 9'd33 && effective\_Y == 8'd37) || (effective\_X == 9'd33 && effective\_Y == 8'd38) ||

(effective\_X == 9'd34 && effective\_Y == 8'd18) || (effective\_X == 9'd34 && effective\_Y == 8'd19) || (effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) || (effective\_X == 9'd34 && effective\_Y == 8'd37) || (effective\_X == 9'd34 && effective\_Y == 8'd38) ||

(effective\_X == 9'd35 && effective\_Y == 8'd18) || (effective\_X == 9'd35 && effective\_Y == 8'd19) || (effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) || (effective\_X == 9'd35 && effective\_Y == 8'd37) || (effective\_X == 9'd35 && effective\_Y == 8'd38) ||

(effective\_X == 9'd36 && effective\_Y == 8'd18) || (effective\_X == 9'd36 && effective\_Y == 8'd19) || (effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) || (effective\_X == 9'd36 && effective\_Y == 8'd37) || (effective\_X == 9'd36 && effective\_Y == 8'd38) ||

(effective\_X == 9'd37 && effective\_Y == 8'd18) || (effective\_X == 9'd37 && effective\_Y == 8'd19) || (effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) || (effective\_X == 9'd37 && effective\_Y == 8'd37) || (effective\_X == 9'd37 && effective\_Y == 8'd38) ||

(effective\_X == 9'd38 && effective\_Y == 8'd18) || (effective\_X == 9'd38 && effective\_Y == 8'd19) || (effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) || (effective\_X == 9'd38 && effective\_Y == 8'd37) || (effective\_X == 9'd38 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[4:2] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[4:2] ^ randNum\_12b[4:2])) : 3'b111;

end

end

if (highscore == 12'd64) begin

if((effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd20) || (effective\_X == 9'd29 && effective\_Y == 8'd21) || (effective\_X == 9'd29 && effective\_Y == 8'd22) || (effective\_X == 9'd29 && effective\_Y == 8'd23) || (effective\_X == 9'd29 && effective\_Y == 8'd24) || (effective\_X == 9'd29 && effective\_Y == 8'd25) || (effective\_X == 9'd29 && effective\_Y == 8'd26) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) || (effective\_X == 9'd29 && effective\_Y == 8'd29) || (effective\_X == 9'd29 && effective\_Y == 8'd30) || (effective\_X == 9'd29 && effective\_Y == 8'd31) || (effective\_X == 9'd29 && effective\_Y == 8'd32) || (effective\_X == 9'd29 && effective\_Y == 8'd33) || (effective\_X == 9'd29 && effective\_Y == 8'd34) || (effective\_X == 9'd29 && effective\_Y == 8'd35) || (effective\_X == 9'd29 && effective\_Y == 8'd36) || (effective\_X == 9'd29 && effective\_Y == 8'd37) || (effective\_X == 9'd29 && effective\_Y == 8'd38) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd20) || (effective\_X == 9'd30 && effective\_Y == 8'd21) || (effective\_X == 9'd30 && effective\_Y == 8'd22) || (effective\_X == 9'd30 && effective\_Y == 8'd23) || (effective\_X == 9'd30 && effective\_Y == 8'd24) || (effective\_X == 9'd30 && effective\_Y == 8'd25) || (effective\_X == 9'd30 && effective\_Y == 8'd26) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) || (effective\_X == 9'd30 && effective\_Y == 8'd29) || (effective\_X == 9'd30 && effective\_Y == 8'd30) || (effective\_X == 9'd30 && effective\_Y == 8'd31) || (effective\_X == 9'd30 && effective\_Y == 8'd32) || (effective\_X == 9'd30 && effective\_Y == 8'd33) || (effective\_X == 9'd30 && effective\_Y == 8'd34) || (effective\_X == 9'd30 && effective\_Y == 8'd35) || (effective\_X == 9'd30 && effective\_Y == 8'd36) || (effective\_X == 9'd30 && effective\_Y == 8'd37) || (effective\_X == 9'd30 && effective\_Y == 8'd38) ||

(effective\_X == 9'd31 && effective\_Y == 8'd18) || (effective\_X == 9'd31 && effective\_Y == 8'd19) || (effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) || (effective\_X == 9'd31 && effective\_Y == 8'd37) || (effective\_X == 9'd31 && effective\_Y == 8'd38) ||

(effective\_X == 9'd32 && effective\_Y == 8'd18) || (effective\_X == 9'd32 && effective\_Y == 8'd19) || (effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) || (effective\_X == 9'd32 && effective\_Y == 8'd37) || (effective\_X == 9'd32 && effective\_Y == 8'd38) ||

(effective\_X == 9'd33 && effective\_Y == 8'd18) || (effective\_X == 9'd33 && effective\_Y == 8'd19) || (effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) || (effective\_X == 9'd33 && effective\_Y == 8'd37) || (effective\_X == 9'd33 && effective\_Y == 8'd38) ||

(effective\_X == 9'd34 && effective\_Y == 8'd18) || (effective\_X == 9'd34 && effective\_Y == 8'd19) || (effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) || (effective\_X == 9'd34 && effective\_Y == 8'd37) || (effective\_X == 9'd34 && effective\_Y == 8'd38) ||

(effective\_X == 9'd35 && effective\_Y == 8'd18) || (effective\_X == 9'd35 && effective\_Y == 8'd19) || (effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) || (effective\_X == 9'd35 && effective\_Y == 8'd37) || (effective\_X == 9'd35 && effective\_Y == 8'd38) ||

(effective\_X == 9'd36 && effective\_Y == 8'd18) || (effective\_X == 9'd36 && effective\_Y == 8'd19) || (effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) || (effective\_X == 9'd36 && effective\_Y == 8'd37) || (effective\_X == 9'd36 && effective\_Y == 8'd38) ||

(effective\_X == 9'd37 && effective\_Y == 8'd18) || (effective\_X == 9'd37 && effective\_Y == 8'd19) || (effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) || (effective\_X == 9'd37 && effective\_Y == 8'd37) || (effective\_X == 9'd37 && effective\_Y == 8'd38) ||

(effective\_X == 9'd38 && effective\_Y == 8'd18) || (effective\_X == 9'd38 && effective\_Y == 8'd19) || (effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) || (effective\_X == 9'd38 && effective\_Y == 8'd37) || (effective\_X == 9'd38 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) ||

(effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) ||

(effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) ||

(effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) ||

(effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) ||

(effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) ||

(effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) ||

(effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) ||

(effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[7:5] ^ randNum\_12b[8:6]) == 3'b0) ? 3'b111 : (randNum\_12b[7:5] ^ randNum\_12b[8:6])) : 3'b111;

end

end

if (highscore == 12'd128) begin

if((effective\_X == 9'd25 && effective\_Y == 8'd18) || (effective\_X == 9'd25 && effective\_Y == 8'd19) || (effective\_X == 9'd25 && effective\_Y == 8'd20) || (effective\_X == 9'd25 && effective\_Y == 8'd21) || (effective\_X == 9'd25 && effective\_Y == 8'd22) || (effective\_X == 9'd25 && effective\_Y == 8'd23) || (effective\_X == 9'd25 && effective\_Y == 8'd24) || (effective\_X == 9'd25 && effective\_Y == 8'd25) || (effective\_X == 9'd25 && effective\_Y == 8'd26) || (effective\_X == 9'd25 && effective\_Y == 8'd27) || (effective\_X == 9'd25 && effective\_Y == 8'd28) || (effective\_X == 9'd25 && effective\_Y == 8'd29) || (effective\_X == 9'd25 && effective\_Y == 8'd30) || (effective\_X == 9'd25 && effective\_Y == 8'd31) || (effective\_X == 9'd25 && effective\_Y == 8'd32) || (effective\_X == 9'd25 && effective\_Y == 8'd33) || (effective\_X == 9'd25 && effective\_Y == 8'd34) || (effective\_X == 9'd25 && effective\_Y == 8'd35) || (effective\_X == 9'd25 && effective\_Y == 8'd36) || (effective\_X == 9'd25 && effective\_Y == 8'd37) || (effective\_X == 9'd25 && effective\_Y == 8'd38) ||

(effective\_X == 9'd26 && effective\_Y == 8'd18) || (effective\_X == 9'd26 && effective\_Y == 8'd19) || (effective\_X == 9'd26 && effective\_Y == 8'd20) || (effective\_X == 9'd26 && effective\_Y == 8'd21) || (effective\_X == 9'd26 && effective\_Y == 8'd22) || (effective\_X == 9'd26 && effective\_Y == 8'd23) || (effective\_X == 9'd26 && effective\_Y == 8'd24) || (effective\_X == 9'd26 && effective\_Y == 8'd25) || (effective\_X == 9'd26 && effective\_Y == 8'd26) || (effective\_X == 9'd26 && effective\_Y == 8'd27) || (effective\_X == 9'd26 && effective\_Y == 8'd28) || (effective\_X == 9'd26 && effective\_Y == 8'd29) || (effective\_X == 9'd26 && effective\_Y == 8'd30) || (effective\_X == 9'd26 && effective\_Y == 8'd31) || (effective\_X == 9'd26 && effective\_Y == 8'd32) || (effective\_X == 9'd26 && effective\_Y == 8'd33) || (effective\_X == 9'd26 && effective\_Y == 8'd34) || (effective\_X == 9'd26 && effective\_Y == 8'd35) || (effective\_X == 9'd26 && effective\_Y == 8'd36) || (effective\_X == 9'd26 && effective\_Y == 8'd37) || (effective\_X == 9'd26 && effective\_Y == 8'd38) ||

(effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) || (effective\_X == 9'd29 && effective\_Y == 8'd29) || (effective\_X == 9'd29 && effective\_Y == 8'd30) || (effective\_X == 9'd29 && effective\_Y == 8'd31) || (effective\_X == 9'd29 && effective\_Y == 8'd32) || (effective\_X == 9'd29 && effective\_Y == 8'd33) || (effective\_X == 9'd29 && effective\_Y == 8'd34) || (effective\_X == 9'd29 && effective\_Y == 8'd35) || (effective\_X == 9'd29 && effective\_Y == 8'd36) || (effective\_X == 9'd29 && effective\_Y == 8'd37) || (effective\_X == 9'd29 && effective\_Y == 8'd38) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) || (effective\_X == 9'd30 && effective\_Y == 8'd29) || (effective\_X == 9'd30 && effective\_Y == 8'd30) || (effective\_X == 9'd30 && effective\_Y == 8'd31) || (effective\_X == 9'd30 && effective\_Y == 8'd32) || (effective\_X == 9'd30 && effective\_Y == 8'd33) || (effective\_X == 9'd30 && effective\_Y == 8'd34) || (effective\_X == 9'd30 && effective\_Y == 8'd35) || (effective\_X == 9'd30 && effective\_Y == 8'd36) || (effective\_X == 9'd30 && effective\_Y == 8'd37) || (effective\_X == 9'd30 && effective\_Y == 8'd38) ||

(effective\_X == 9'd31 && effective\_Y == 8'd18) || (effective\_X == 9'd31 && effective\_Y == 8'd19) || (effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) || (effective\_X == 9'd31 && effective\_Y == 8'd37) || (effective\_X == 9'd31 && effective\_Y == 8'd38) ||

(effective\_X == 9'd32 && effective\_Y == 8'd18) || (effective\_X == 9'd32 && effective\_Y == 8'd19) || (effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) || (effective\_X == 9'd32 && effective\_Y == 8'd37) || (effective\_X == 9'd32 && effective\_Y == 8'd38) ||

(effective\_X == 9'd33 && effective\_Y == 8'd18) || (effective\_X == 9'd33 && effective\_Y == 8'd19) || (effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) || (effective\_X == 9'd33 && effective\_Y == 8'd37) || (effective\_X == 9'd33 && effective\_Y == 8'd38) ||

(effective\_X == 9'd34 && effective\_Y == 8'd18) || (effective\_X == 9'd34 && effective\_Y == 8'd19) || (effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) || (effective\_X == 9'd34 && effective\_Y == 8'd37) || (effective\_X == 9'd34 && effective\_Y == 8'd38) ||

(effective\_X == 9'd35 && effective\_Y == 8'd18) || (effective\_X == 9'd35 && effective\_Y == 8'd19) || (effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) || (effective\_X == 9'd35 && effective\_Y == 8'd37) || (effective\_X == 9'd35 && effective\_Y == 8'd38) ||

(effective\_X == 9'd36 && effective\_Y == 8'd18) || (effective\_X == 9'd36 && effective\_Y == 8'd19) || (effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) || (effective\_X == 9'd36 && effective\_Y == 8'd37) || (effective\_X == 9'd36 && effective\_Y == 8'd38) ||

(effective\_X == 9'd37 && effective\_Y == 8'd18) || (effective\_X == 9'd37 && effective\_Y == 8'd19) || (effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) || (effective\_X == 9'd37 && effective\_Y == 8'd37) || (effective\_X == 9'd37 && effective\_Y == 8'd38) ||

(effective\_X == 9'd38 && effective\_Y == 8'd18) || (effective\_X == 9'd38 && effective\_Y == 8'd19) || (effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) || (effective\_X == 9'd38 && effective\_Y == 8'd37) || (effective\_X == 9'd38 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[4:2])) : 3'b111;

end

end

if (highscore == 12'd256) begin

if((effective\_X == 9'd15 && effective\_Y == 8'd18) || (effective\_X == 9'd15 && effective\_Y == 8'd19) || (effective\_X == 9'd15 && effective\_Y == 8'd27) || (effective\_X == 9'd15 && effective\_Y == 8'd28) || (effective\_X == 9'd15 && effective\_Y == 8'd29) || (effective\_X == 9'd15 && effective\_Y == 8'd30) || (effective\_X == 9'd15 && effective\_Y == 8'd31) || (effective\_X == 9'd15 && effective\_Y == 8'd32) || (effective\_X == 9'd15 && effective\_Y == 8'd33) || (effective\_X == 9'd15 && effective\_Y == 8'd34) || (effective\_X == 9'd15 && effective\_Y == 8'd35) || (effective\_X == 9'd15 && effective\_Y == 8'd36) || (effective\_X == 9'd15 && effective\_Y == 8'd37) || (effective\_X == 9'd15 && effective\_Y == 8'd38) ||

(effective\_X == 9'd16 && effective\_Y == 8'd18) || (effective\_X == 9'd16 && effective\_Y == 8'd19) || (effective\_X == 9'd16 && effective\_Y == 8'd27) || (effective\_X == 9'd16 && effective\_Y == 8'd28) || (effective\_X == 9'd16 && effective\_Y == 8'd29) || (effective\_X == 9'd16 && effective\_Y == 8'd30) || (effective\_X == 9'd16 && effective\_Y == 8'd31) || (effective\_X == 9'd16 && effective\_Y == 8'd32) || (effective\_X == 9'd16 && effective\_Y == 8'd33) || (effective\_X == 9'd16 && effective\_Y == 8'd34) || (effective\_X == 9'd16 && effective\_Y == 8'd35) || (effective\_X == 9'd16 && effective\_Y == 8'd36) || (effective\_X == 9'd16 && effective\_Y == 8'd37) || (effective\_X == 9'd16 && effective\_Y == 8'd38) ||

(effective\_X == 9'd17 && effective\_Y == 8'd18) || (effective\_X == 9'd17 && effective\_Y == 8'd19) || (effective\_X == 9'd17 && effective\_Y == 8'd27) || (effective\_X == 9'd17 && effective\_Y == 8'd28) || (effective\_X == 9'd17 && effective\_Y == 8'd37) || (effective\_X == 9'd17 && effective\_Y == 8'd38) ||

(effective\_X == 9'd18 && effective\_Y == 8'd18) || (effective\_X == 9'd18 && effective\_Y == 8'd19) || (effective\_X == 9'd18 && effective\_Y == 8'd27) || (effective\_X == 9'd18 && effective\_Y == 8'd28) || (effective\_X == 9'd18 && effective\_Y == 8'd37) || (effective\_X == 9'd18 && effective\_Y == 8'd38) ||

(effective\_X == 9'd19 && effective\_Y == 8'd18) || (effective\_X == 9'd19 && effective\_Y == 8'd19) || (effective\_X == 9'd19 && effective\_Y == 8'd27) || (effective\_X == 9'd19 && effective\_Y == 8'd28) || (effective\_X == 9'd19 && effective\_Y == 8'd37) || (effective\_X == 9'd19 && effective\_Y == 8'd38) ||

(effective\_X == 9'd20 && effective\_Y == 8'd18) || (effective\_X == 9'd20 && effective\_Y == 8'd19) || (effective\_X == 9'd20 && effective\_Y == 8'd27) || (effective\_X == 9'd20 && effective\_Y == 8'd28) || (effective\_X == 9'd20 && effective\_Y == 8'd37) || (effective\_X == 9'd20 && effective\_Y == 8'd38) ||

(effective\_X == 9'd21 && effective\_Y == 8'd18) || (effective\_X == 9'd21 && effective\_Y == 8'd19) || (effective\_X == 9'd21 && effective\_Y == 8'd27) || (effective\_X == 9'd21 && effective\_Y == 8'd28) || (effective\_X == 9'd21 && effective\_Y == 8'd37) || (effective\_X == 9'd21 && effective\_Y == 8'd38) ||

(effective\_X == 9'd22 && effective\_Y == 8'd18) || (effective\_X == 9'd22 && effective\_Y == 8'd19) || (effective\_X == 9'd22 && effective\_Y == 8'd27) || (effective\_X == 9'd22 && effective\_Y == 8'd28) || (effective\_X == 9'd22 && effective\_Y == 8'd37) || (effective\_X == 9'd22 && effective\_Y == 8'd38) ||

(effective\_X == 9'd23 && effective\_Y == 8'd18) || (effective\_X == 9'd23 && effective\_Y == 8'd19) || (effective\_X == 9'd23 && effective\_Y == 8'd27) || (effective\_X == 9'd23 && effective\_Y == 8'd28) || (effective\_X == 9'd23 && effective\_Y == 8'd37) || (effective\_X == 9'd23 && effective\_Y == 8'd38) ||

(effective\_X == 9'd24 && effective\_Y == 8'd18) || (effective\_X == 9'd24 && effective\_Y == 8'd19) || (effective\_X == 9'd24 && effective\_Y == 8'd27) || (effective\_X == 9'd24 && effective\_Y == 8'd28) || (effective\_X == 9'd24 && effective\_Y == 8'd37) || (effective\_X == 9'd24 && effective\_Y == 8'd38) ||

(effective\_X == 9'd25 && effective\_Y == 8'd18) || (effective\_X == 9'd25 && effective\_Y == 8'd19) || (effective\_X == 9'd25 && effective\_Y == 8'd20) || (effective\_X == 9'd25 && effective\_Y == 8'd21) || (effective\_X == 9'd25 && effective\_Y == 8'd22) || (effective\_X == 9'd25 && effective\_Y == 8'd23) || (effective\_X == 9'd25 && effective\_Y == 8'd24) || (effective\_X == 9'd25 && effective\_Y == 8'd25) || (effective\_X == 9'd25 && effective\_Y == 8'd26) || (effective\_X == 9'd25 && effective\_Y == 8'd27) || (effective\_X == 9'd25 && effective\_Y == 8'd28) || (effective\_X == 9'd25 && effective\_Y == 8'd37) || (effective\_X == 9'd25 && effective\_Y == 8'd38) ||

(effective\_X == 9'd26 && effective\_Y == 8'd18) || (effective\_X == 9'd26 && effective\_Y == 8'd19) || (effective\_X == 9'd26 && effective\_Y == 8'd20) || (effective\_X == 9'd26 && effective\_Y == 8'd21) || (effective\_X == 9'd26 && effective\_Y == 8'd22) || (effective\_X == 9'd26 && effective\_Y == 8'd23) || (effective\_X == 9'd26 && effective\_Y == 8'd24) || (effective\_X == 9'd26 && effective\_Y == 8'd25) || (effective\_X == 9'd26 && effective\_Y == 8'd26) || (effective\_X == 9'd26 && effective\_Y == 8'd27) || (effective\_X == 9'd26 && effective\_Y == 8'd28) || (effective\_X == 9'd26 && effective\_Y == 8'd37) || (effective\_X == 9'd26 && effective\_Y == 8'd38) ||

(effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd20) || (effective\_X == 9'd29 && effective\_Y == 8'd21) || (effective\_X == 9'd29 && effective\_Y == 8'd22) || (effective\_X == 9'd29 && effective\_Y == 8'd23) || (effective\_X == 9'd29 && effective\_Y == 8'd24) || (effective\_X == 9'd29 && effective\_Y == 8'd25) || (effective\_X == 9'd29 && effective\_Y == 8'd26) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) || (effective\_X == 9'd29 && effective\_Y == 8'd37) || (effective\_X == 9'd29 && effective\_Y == 8'd38) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd20) || (effective\_X == 9'd30 && effective\_Y == 8'd21) || (effective\_X == 9'd30 && effective\_Y == 8'd22) || (effective\_X == 9'd30 && effective\_Y == 8'd23) || (effective\_X == 9'd30 && effective\_Y == 8'd24) || (effective\_X == 9'd30 && effective\_Y == 8'd25) || (effective\_X == 9'd30 && effective\_Y == 8'd26) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) || (effective\_X == 9'd30 && effective\_Y == 8'd37) || (effective\_X == 9'd30 && effective\_Y == 8'd38) ||

(effective\_X == 9'd31 && effective\_Y == 8'd18) || (effective\_X == 9'd31 && effective\_Y == 8'd19) || (effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) || (effective\_X == 9'd31 && effective\_Y == 8'd37) || (effective\_X == 9'd31 && effective\_Y == 8'd38) ||

(effective\_X == 9'd32 && effective\_Y == 8'd18) || (effective\_X == 9'd32 && effective\_Y == 8'd19) || (effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) || (effective\_X == 9'd32 && effective\_Y == 8'd37) || (effective\_X == 9'd32 && effective\_Y == 8'd38) ||

(effective\_X == 9'd33 && effective\_Y == 8'd18) || (effective\_X == 9'd33 && effective\_Y == 8'd19) || (effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) || (effective\_X == 9'd33 && effective\_Y == 8'd37) || (effective\_X == 9'd33 && effective\_Y == 8'd38) ||

(effective\_X == 9'd34 && effective\_Y == 8'd18) || (effective\_X == 9'd34 && effective\_Y == 8'd19) || (effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) || (effective\_X == 9'd34 && effective\_Y == 8'd37) || (effective\_X == 9'd34 && effective\_Y == 8'd38) ||

(effective\_X == 9'd35 && effective\_Y == 8'd18) || (effective\_X == 9'd35 && effective\_Y == 8'd19) || (effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) || (effective\_X == 9'd35 && effective\_Y == 8'd37) || (effective\_X == 9'd35 && effective\_Y == 8'd38) ||

(effective\_X == 9'd36 && effective\_Y == 8'd18) || (effective\_X == 9'd36 && effective\_Y == 8'd19) || (effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) || (effective\_X == 9'd36 && effective\_Y == 8'd37) || (effective\_X == 9'd36 && effective\_Y == 8'd38) ||

(effective\_X == 9'd37 && effective\_Y == 8'd18) || (effective\_X == 9'd37 && effective\_Y == 8'd19) || (effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) || (effective\_X == 9'd37 && effective\_Y == 8'd37) || (effective\_X == 9'd37 && effective\_Y == 8'd38) ||

(effective\_X == 9'd38 && effective\_Y == 8'd18) || (effective\_X == 9'd38 && effective\_Y == 8'd19) || (effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) || (effective\_X == 9'd38 && effective\_Y == 8'd37) || (effective\_X == 9'd38 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[6:4] ^ randNum\_12b[9:7]) == 3'b0) ? 3'b111 : (randNum\_12b[6:4] ^ randNum\_12b[9:7])) : 3'b111;

end

end

if (highscore == 12'd512) begin

if((effective\_X == 9'd15 && effective\_Y == 8'd18) || (effective\_X == 9'd15 && effective\_Y == 8'd19) || (effective\_X == 9'd15 && effective\_Y == 8'd20) || (effective\_X == 9'd15 && effective\_Y == 8'd21) || (effective\_X == 9'd15 && effective\_Y == 8'd22) || (effective\_X == 9'd15 && effective\_Y == 8'd23) || (effective\_X == 9'd15 && effective\_Y == 8'd24) || (effective\_X == 9'd15 && effective\_Y == 8'd25) || (effective\_X == 9'd15 && effective\_Y == 8'd26) || (effective\_X == 9'd15 && effective\_Y == 8'd27) || (effective\_X == 9'd15 && effective\_Y == 8'd28) || (effective\_X == 9'd15 && effective\_Y == 8'd37) || (effective\_X == 9'd15 && effective\_Y == 8'd38) ||

(effective\_X == 9'd16 && effective\_Y == 8'd18) || (effective\_X == 9'd16 && effective\_Y == 8'd19) || (effective\_X == 9'd16 && effective\_Y == 8'd20) || (effective\_X == 9'd16 && effective\_Y == 8'd21) || (effective\_X == 9'd16 && effective\_Y == 8'd22) || (effective\_X == 9'd16 && effective\_Y == 8'd23) || (effective\_X == 9'd16 && effective\_Y == 8'd24) || (effective\_X == 9'd16 && effective\_Y == 8'd25) || (effective\_X == 9'd16 && effective\_Y == 8'd26) || (effective\_X == 9'd16 && effective\_Y == 8'd27) || (effective\_X == 9'd16 && effective\_Y == 8'd28) || (effective\_X == 9'd16 && effective\_Y == 8'd37) || (effective\_X == 9'd16 && effective\_Y == 8'd38) ||

(effective\_X == 9'd17 && effective\_Y == 8'd18) || (effective\_X == 9'd17 && effective\_Y == 8'd19) || (effective\_X == 9'd17 && effective\_Y == 8'd27) || (effective\_X == 9'd17 && effective\_Y == 8'd28) || (effective\_X == 9'd17 && effective\_Y == 8'd37) || (effective\_X == 9'd17 && effective\_Y == 8'd38) ||

(effective\_X == 9'd18 && effective\_Y == 8'd18) || (effective\_X == 9'd18 && effective\_Y == 8'd19) || (effective\_X == 9'd18 && effective\_Y == 8'd27) || (effective\_X == 9'd18 && effective\_Y == 8'd28) || (effective\_X == 9'd18 && effective\_Y == 8'd37) || (effective\_X == 9'd18 && effective\_Y == 8'd38) ||

(effective\_X == 9'd19 && effective\_Y == 8'd18) || (effective\_X == 9'd19 && effective\_Y == 8'd19) || (effective\_X == 9'd19 && effective\_Y == 8'd27) || (effective\_X == 9'd19 && effective\_Y == 8'd28) || (effective\_X == 9'd19 && effective\_Y == 8'd37) || (effective\_X == 9'd19 && effective\_Y == 8'd38) ||

(effective\_X == 9'd20 && effective\_Y == 8'd18) || (effective\_X == 9'd20 && effective\_Y == 8'd19) || (effective\_X == 9'd20 && effective\_Y == 8'd27) || (effective\_X == 9'd20 && effective\_Y == 8'd28) || (effective\_X == 9'd20 && effective\_Y == 8'd37) || (effective\_X == 9'd20 && effective\_Y == 8'd38) ||

(effective\_X == 9'd21 && effective\_Y == 8'd18) || (effective\_X == 9'd21 && effective\_Y == 8'd19) || (effective\_X == 9'd21 && effective\_Y == 8'd27) || (effective\_X == 9'd21 && effective\_Y == 8'd28) || (effective\_X == 9'd21 && effective\_Y == 8'd37) || (effective\_X == 9'd21 && effective\_Y == 8'd38) ||

(effective\_X == 9'd22 && effective\_Y == 8'd18) || (effective\_X == 9'd22 && effective\_Y == 8'd19) || (effective\_X == 9'd22 && effective\_Y == 8'd27) || (effective\_X == 9'd22 && effective\_Y == 8'd28) || (effective\_X == 9'd22 && effective\_Y == 8'd37) || (effective\_X == 9'd22 && effective\_Y == 8'd38) ||

(effective\_X == 9'd23 && effective\_Y == 8'd18) || (effective\_X == 9'd23 && effective\_Y == 8'd19) || (effective\_X == 9'd23 && effective\_Y == 8'd27) || (effective\_X == 9'd23 && effective\_Y == 8'd28) || (effective\_X == 9'd23 && effective\_Y == 8'd37) || (effective\_X == 9'd23 && effective\_Y == 8'd38) ||

(effective\_X == 9'd24 && effective\_Y == 8'd18) || (effective\_X == 9'd24 && effective\_Y == 8'd19) || (effective\_X == 9'd24 && effective\_Y == 8'd27) || (effective\_X == 9'd24 && effective\_Y == 8'd28) || (effective\_X == 9'd24 && effective\_Y == 8'd37) || (effective\_X == 9'd24 && effective\_Y == 8'd38) ||

(effective\_X == 9'd25 && effective\_Y == 8'd18) || (effective\_X == 9'd25 && effective\_Y == 8'd19) || (effective\_X == 9'd25 && effective\_Y == 8'd27) || (effective\_X == 9'd25 && effective\_Y == 8'd28) || (effective\_X == 9'd25 && effective\_Y == 8'd29) || (effective\_X == 9'd25 && effective\_Y == 8'd30) || (effective\_X == 9'd25 && effective\_Y == 8'd31) || (effective\_X == 9'd25 && effective\_Y == 8'd32) || (effective\_X == 9'd25 && effective\_Y == 8'd33) || (effective\_X == 9'd25 && effective\_Y == 8'd34) || (effective\_X == 9'd25 && effective\_Y == 8'd35) || (effective\_X == 9'd25 && effective\_Y == 8'd36) || (effective\_X == 9'd25 && effective\_Y == 8'd37) || (effective\_X == 9'd25 && effective\_Y == 8'd38) ||

(effective\_X == 9'd26 && effective\_Y == 8'd18) || (effective\_X == 9'd26 && effective\_Y == 8'd19) || (effective\_X == 9'd26 && effective\_Y == 8'd27) || (effective\_X == 9'd26 && effective\_Y == 8'd28) || (effective\_X == 9'd26 && effective\_Y == 8'd29) || (effective\_X == 9'd26 && effective\_Y == 8'd30) || (effective\_X == 9'd26 && effective\_Y == 8'd31) || (effective\_X == 9'd26 && effective\_Y == 8'd32) || (effective\_X == 9'd26 && effective\_Y == 8'd33) || (effective\_X == 9'd26 && effective\_Y == 8'd34) || (effective\_X == 9'd26 && effective\_Y == 8'd35) || (effective\_X == 9'd26 && effective\_Y == 8'd36) || (effective\_X == 9'd26 && effective\_Y == 8'd37) || (effective\_X == 9'd26 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[6:4] ^ randNum\_12b[5:3]) == 3'b0) ? 3'b111 : (randNum\_12b[6:4] ^ randNum\_12b[5:3])) : 3'b111;

end

end

if (highscore == 12'd1024) begin

if((effective\_X == 9'd11 && effective\_Y == 8'd18) || (effective\_X == 9'd11 && effective\_Y == 8'd19) || (effective\_X == 9'd11 && effective\_Y == 8'd20) || (effective\_X == 9'd11 && effective\_Y == 8'd21) || (effective\_X == 9'd11 && effective\_Y == 8'd22) || (effective\_X == 9'd11 && effective\_Y == 8'd23) || (effective\_X == 9'd11 && effective\_Y == 8'd24) || (effective\_X == 9'd11 && effective\_Y == 8'd25) || (effective\_X == 9'd11 && effective\_Y == 8'd26) || (effective\_X == 9'd11 && effective\_Y == 8'd27) || (effective\_X == 9'd11 && effective\_Y == 8'd28) || (effective\_X == 9'd11 && effective\_Y == 8'd29) || (effective\_X == 9'd11 && effective\_Y == 8'd30) || (effective\_X == 9'd11 && effective\_Y == 8'd31) || (effective\_X == 9'd11 && effective\_Y == 8'd32) || (effective\_X == 9'd11 && effective\_Y == 8'd33) || (effective\_X == 9'd11 && effective\_Y == 8'd34) || (effective\_X == 9'd11 && effective\_Y == 8'd35) || (effective\_X == 9'd11 && effective\_Y == 8'd36) || (effective\_X == 9'd11 && effective\_Y == 8'd37) || (effective\_X == 9'd11 && effective\_Y == 8'd38) ||

(effective\_X == 9'd12 && effective\_Y == 8'd18) || (effective\_X == 9'd12 && effective\_Y == 8'd19) || (effective\_X == 9'd12 && effective\_Y == 8'd20) || (effective\_X == 9'd12 && effective\_Y == 8'd21) || (effective\_X == 9'd12 && effective\_Y == 8'd22) || (effective\_X == 9'd12 && effective\_Y == 8'd23) || (effective\_X == 9'd12 && effective\_Y == 8'd24) || (effective\_X == 9'd12 && effective\_Y == 8'd25) || (effective\_X == 9'd12 && effective\_Y == 8'd26) || (effective\_X == 9'd12 && effective\_Y == 8'd27) || (effective\_X == 9'd12 && effective\_Y == 8'd28) || (effective\_X == 9'd12 && effective\_Y == 8'd29) || (effective\_X == 9'd12 && effective\_Y == 8'd30) || (effective\_X == 9'd12 && effective\_Y == 8'd31) || (effective\_X == 9'd12 && effective\_Y == 8'd32) || (effective\_X == 9'd12 && effective\_Y == 8'd33) || (effective\_X == 9'd12 && effective\_Y == 8'd34) || (effective\_X == 9'd12 && effective\_Y == 8'd35) || (effective\_X == 9'd12 && effective\_Y == 8'd36) || (effective\_X == 9'd12 && effective\_Y == 8'd37) || (effective\_X == 9'd12 && effective\_Y == 8'd38) ||

(effective\_X == 9'd15 && effective\_Y == 8'd18) || (effective\_X == 9'd15 && effective\_Y == 8'd19) || (effective\_X == 9'd15 && effective\_Y == 8'd20) || (effective\_X == 9'd15 && effective\_Y == 8'd21) || (effective\_X == 9'd15 && effective\_Y == 8'd22) || (effective\_X == 9'd15 && effective\_Y == 8'd23) || (effective\_X == 9'd15 && effective\_Y == 8'd24) || (effective\_X == 9'd15 && effective\_Y == 8'd25) || (effective\_X == 9'd15 && effective\_Y == 8'd26) || (effective\_X == 9'd15 && effective\_Y == 8'd27) || (effective\_X == 9'd15 && effective\_Y == 8'd28) || (effective\_X == 9'd15 && effective\_Y == 8'd29) || (effective\_X == 9'd15 && effective\_Y == 8'd30) || (effective\_X == 9'd15 && effective\_Y == 8'd31) || (effective\_X == 9'd15 && effective\_Y == 8'd32) || (effective\_X == 9'd15 && effective\_Y == 8'd33) || (effective\_X == 9'd15 && effective\_Y == 8'd34) || (effective\_X == 9'd15 && effective\_Y == 8'd35) || (effective\_X == 9'd15 && effective\_Y == 8'd36) || (effective\_X == 9'd15 && effective\_Y == 8'd37) || (effective\_X == 9'd15 && effective\_Y == 8'd38) ||

(effective\_X == 9'd16 && effective\_Y == 8'd18) || (effective\_X == 9'd16 && effective\_Y == 8'd19) || (effective\_X == 9'd16 && effective\_Y == 8'd20) || (effective\_X == 9'd16 && effective\_Y == 8'd21) || (effective\_X == 9'd16 && effective\_Y == 8'd22) || (effective\_X == 9'd16 && effective\_Y == 8'd23) || (effective\_X == 9'd16 && effective\_Y == 8'd24) || (effective\_X == 9'd16 && effective\_Y == 8'd25) || (effective\_X == 9'd16 && effective\_Y == 8'd26) || (effective\_X == 9'd16 && effective\_Y == 8'd27) || (effective\_X == 9'd16 && effective\_Y == 8'd28) || (effective\_X == 9'd16 && effective\_Y == 8'd29) || (effective\_X == 9'd16 && effective\_Y == 8'd30) || (effective\_X == 9'd16 && effective\_Y == 8'd31) || (effective\_X == 9'd16 && effective\_Y == 8'd32) || (effective\_X == 9'd16 && effective\_Y == 8'd33) || (effective\_X == 9'd16 && effective\_Y == 8'd34) || (effective\_X == 9'd16 && effective\_Y == 8'd35) || (effective\_X == 9'd16 && effective\_Y == 8'd36) || (effective\_X == 9'd16 && effective\_Y == 8'd37) || (effective\_X == 9'd16 && effective\_Y == 8'd38) ||

(effective\_X == 9'd17 && effective\_Y == 8'd18) || (effective\_X == 9'd17 && effective\_Y == 8'd19) || (effective\_X == 9'd17 && effective\_Y == 8'd37) || (effective\_X == 9'd17 && effective\_Y == 8'd38) ||

(effective\_X == 9'd18 && effective\_Y == 8'd18) || (effective\_X == 9'd18 && effective\_Y == 8'd19) || (effective\_X == 9'd18 && effective\_Y == 8'd37) || (effective\_X == 9'd18 && effective\_Y == 8'd38) ||

(effective\_X == 9'd19 && effective\_Y == 8'd18) || (effective\_X == 9'd19 && effective\_Y == 8'd19) || (effective\_X == 9'd19 && effective\_Y == 8'd37) || (effective\_X == 9'd19 && effective\_Y == 8'd38) ||

(effective\_X == 9'd20 && effective\_Y == 8'd18) || (effective\_X == 9'd20 && effective\_Y == 8'd19) || (effective\_X == 9'd20 && effective\_Y == 8'd37) || (effective\_X == 9'd20 && effective\_Y == 8'd38) ||

(effective\_X == 9'd21 && effective\_Y == 8'd18) || (effective\_X == 9'd21 && effective\_Y == 8'd19) || (effective\_X == 9'd21 && effective\_Y == 8'd37) || (effective\_X == 9'd21 && effective\_Y == 8'd38) ||

(effective\_X == 9'd22 && effective\_Y == 8'd18) || (effective\_X == 9'd22 && effective\_Y == 8'd19) || (effective\_X == 9'd22 && effective\_Y == 8'd37) || (effective\_X == 9'd22 && effective\_Y == 8'd38) ||

(effective\_X == 9'd23 && effective\_Y == 8'd18) || (effective\_X == 9'd23 && effective\_Y == 8'd19) || (effective\_X == 9'd23 && effective\_Y == 8'd37) || (effective\_X == 9'd23 && effective\_Y == 8'd38) ||

(effective\_X == 9'd24 && effective\_Y == 8'd18) || (effective\_X == 9'd24 && effective\_Y == 8'd19) || (effective\_X == 9'd24 && effective\_Y == 8'd37) || (effective\_X == 9'd24 && effective\_Y == 8'd38) ||

(effective\_X == 9'd25 && effective\_Y == 8'd18) || (effective\_X == 9'd25 && effective\_Y == 8'd19) || (effective\_X == 9'd25 && effective\_Y == 8'd20) || (effective\_X == 9'd25 && effective\_Y == 8'd21) || (effective\_X == 9'd25 && effective\_Y == 8'd22) || (effective\_X == 9'd25 && effective\_Y == 8'd23) || (effective\_X == 9'd25 && effective\_Y == 8'd24) || (effective\_X == 9'd25 && effective\_Y == 8'd25) || (effective\_X == 9'd25 && effective\_Y == 8'd26) || (effective\_X == 9'd25 && effective\_Y == 8'd27) || (effective\_X == 9'd25 && effective\_Y == 8'd28) || (effective\_X == 9'd25 && effective\_Y == 8'd29) || (effective\_X == 9'd25 && effective\_Y == 8'd30) || (effective\_X == 9'd25 && effective\_Y == 8'd31) || (effective\_X == 9'd25 && effective\_Y == 8'd32) || (effective\_X == 9'd25 && effective\_Y == 8'd33) || (effective\_X == 9'd25 && effective\_Y == 8'd34) || (effective\_X == 9'd25 && effective\_Y == 8'd35) || (effective\_X == 9'd25 && effective\_Y == 8'd36) || (effective\_X == 9'd25 && effective\_Y == 8'd37) || (effective\_X == 9'd25 && effective\_Y == 8'd38) ||

(effective\_X == 9'd26 && effective\_Y == 8'd18) || (effective\_X == 9'd26 && effective\_Y == 8'd19) || (effective\_X == 9'd26 && effective\_Y == 8'd20) || (effective\_X == 9'd26 && effective\_Y == 8'd21) || (effective\_X == 9'd26 && effective\_Y == 8'd22) || (effective\_X == 9'd26 && effective\_Y == 8'd23) || (effective\_X == 9'd26 && effective\_Y == 8'd24) || (effective\_X == 9'd26 && effective\_Y == 8'd25) || (effective\_X == 9'd26 && effective\_Y == 8'd26) || (effective\_X == 9'd26 && effective\_Y == 8'd27) || (effective\_X == 9'd26 && effective\_Y == 8'd28) || (effective\_X == 9'd26 && effective\_Y == 8'd29) || (effective\_X == 9'd26 && effective\_Y == 8'd30) || (effective\_X == 9'd26 && effective\_Y == 8'd31) || (effective\_X == 9'd26 && effective\_Y == 8'd32) || (effective\_X == 9'd26 && effective\_Y == 8'd33) || (effective\_X == 9'd26 && effective\_Y == 8'd34) || (effective\_X == 9'd26 && effective\_Y == 8'd35) || (effective\_X == 9'd26 && effective\_Y == 8'd36) || (effective\_X == 9'd26 && effective\_Y == 8'd37) || (effective\_X == 9'd26 && effective\_Y == 8'd38) ||

(effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) || (effective\_X == 9'd29 && effective\_Y == 8'd29) || (effective\_X == 9'd29 && effective\_Y == 8'd30) || (effective\_X == 9'd29 && effective\_Y == 8'd31) || (effective\_X == 9'd29 && effective\_Y == 8'd32) || (effective\_X == 9'd29 && effective\_Y == 8'd33) || (effective\_X == 9'd29 && effective\_Y == 8'd34) || (effective\_X == 9'd29 && effective\_Y == 8'd35) || (effective\_X == 9'd29 && effective\_Y == 8'd36) || (effective\_X == 9'd29 && effective\_Y == 8'd37) || (effective\_X == 9'd29 && effective\_Y == 8'd38) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) || (effective\_X == 9'd30 && effective\_Y == 8'd29) || (effective\_X == 9'd30 && effective\_Y == 8'd30) || (effective\_X == 9'd30 && effective\_Y == 8'd31) || (effective\_X == 9'd30 && effective\_Y == 8'd32) || (effective\_X == 9'd30 && effective\_Y == 8'd33) || (effective\_X == 9'd30 && effective\_Y == 8'd34) || (effective\_X == 9'd30 && effective\_Y == 8'd35) || (effective\_X == 9'd30 && effective\_Y == 8'd36) || (effective\_X == 9'd30 && effective\_Y == 8'd37) || (effective\_X == 9'd30 && effective\_Y == 8'd38) ||

(effective\_X == 9'd31 && effective\_Y == 8'd18) || (effective\_X == 9'd31 && effective\_Y == 8'd19) || (effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) || (effective\_X == 9'd31 && effective\_Y == 8'd37) || (effective\_X == 9'd31 && effective\_Y == 8'd38) ||

(effective\_X == 9'd32 && effective\_Y == 8'd18) || (effective\_X == 9'd32 && effective\_Y == 8'd19) || (effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) || (effective\_X == 9'd32 && effective\_Y == 8'd37) || (effective\_X == 9'd32 && effective\_Y == 8'd38) ||

(effective\_X == 9'd33 && effective\_Y == 8'd18) || (effective\_X == 9'd33 && effective\_Y == 8'd19) || (effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) || (effective\_X == 9'd33 && effective\_Y == 8'd37) || (effective\_X == 9'd33 && effective\_Y == 8'd38) ||

(effective\_X == 9'd34 && effective\_Y == 8'd18) || (effective\_X == 9'd34 && effective\_Y == 8'd19) || (effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) || (effective\_X == 9'd34 && effective\_Y == 8'd37) || (effective\_X == 9'd34 && effective\_Y == 8'd38) ||

(effective\_X == 9'd35 && effective\_Y == 8'd18) || (effective\_X == 9'd35 && effective\_Y == 8'd19) || (effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) || (effective\_X == 9'd35 && effective\_Y == 8'd37) || (effective\_X == 9'd35 && effective\_Y == 8'd38) ||

(effective\_X == 9'd36 && effective\_Y == 8'd18) || (effective\_X == 9'd36 && effective\_Y == 8'd19) || (effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) || (effective\_X == 9'd36 && effective\_Y == 8'd37) || (effective\_X == 9'd36 && effective\_Y == 8'd38) ||

(effective\_X == 9'd37 && effective\_Y == 8'd18) || (effective\_X == 9'd37 && effective\_Y == 8'd19) || (effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) || (effective\_X == 9'd37 && effective\_Y == 8'd37) || (effective\_X == 9'd37 && effective\_Y == 8'd38) ||

(effective\_X == 9'd38 && effective\_Y == 8'd18) || (effective\_X == 9'd38 && effective\_Y == 8'd19) || (effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) || (effective\_X == 9'd38 && effective\_Y == 8'd37) || (effective\_X == 9'd38 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) ||

(effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) ||

(effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) ||

(effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) ||

(effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) ||

(effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) ||

(effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) ||

(effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) ||

(effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[9:7]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[9:7])) : 3'b111;

end

end

if (highscore == 12'd2048) begin

if((effective\_X == 9'd1 && effective\_Y == 8'd18) || (effective\_X == 9'd1 && effective\_Y == 8'd19) || (effective\_X == 9'd1 && effective\_Y == 8'd27) || (effective\_X == 9'd1 && effective\_Y == 8'd28) || (effective\_X == 9'd1 && effective\_Y == 8'd29) || (effective\_X == 9'd1 && effective\_Y == 8'd30) || (effective\_X == 9'd1 && effective\_Y == 8'd31) || (effective\_X == 9'd1 && effective\_Y == 8'd32) || (effective\_X == 9'd1 && effective\_Y == 8'd33) || (effective\_X == 9'd1 && effective\_Y == 8'd34) || (effective\_X == 9'd1 && effective\_Y == 8'd35) || (effective\_X == 9'd1 && effective\_Y == 8'd36) || (effective\_X == 9'd1 && effective\_Y == 8'd37) || (effective\_X == 9'd1 && effective\_Y == 8'd38) ||

(effective\_X == 9'd2 && effective\_Y == 8'd18) || (effective\_X == 9'd2 && effective\_Y == 8'd19) || (effective\_X == 9'd2 && effective\_Y == 8'd27) || (effective\_X == 9'd2 && effective\_Y == 8'd28) || (effective\_X == 9'd2 && effective\_Y == 8'd29) || (effective\_X == 9'd2 && effective\_Y == 8'd30) || (effective\_X == 9'd2 && effective\_Y == 8'd31) || (effective\_X == 9'd2 && effective\_Y == 8'd32) || (effective\_X == 9'd2 && effective\_Y == 8'd33) || (effective\_X == 9'd2 && effective\_Y == 8'd34) || (effective\_X == 9'd2 && effective\_Y == 8'd35) || (effective\_X == 9'd2 && effective\_Y == 8'd36) || (effective\_X == 9'd2 && effective\_Y == 8'd37) || (effective\_X == 9'd2 && effective\_Y == 8'd38) ||

(effective\_X == 9'd3 && effective\_Y == 8'd18) || (effective\_X == 9'd3 && effective\_Y == 8'd19) || (effective\_X == 9'd3 && effective\_Y == 8'd27) || (effective\_X == 9'd3 && effective\_Y == 8'd28) || (effective\_X == 9'd3 && effective\_Y == 8'd37) || (effective\_X == 9'd3 && effective\_Y == 8'd38) ||

(effective\_X == 9'd4 && effective\_Y == 8'd18) || (effective\_X == 9'd4 && effective\_Y == 8'd19) || (effective\_X == 9'd4 && effective\_Y == 8'd27) || (effective\_X == 9'd4 && effective\_Y == 8'd28) || (effective\_X == 9'd4 && effective\_Y == 8'd37) || (effective\_X == 9'd4 && effective\_Y == 8'd38) ||

(effective\_X == 9'd5 && effective\_Y == 8'd18) || (effective\_X == 9'd5 && effective\_Y == 8'd19) || (effective\_X == 9'd5 && effective\_Y == 8'd27) || (effective\_X == 9'd5 && effective\_Y == 8'd28) || (effective\_X == 9'd5 && effective\_Y == 8'd37) || (effective\_X == 9'd5 && effective\_Y == 8'd38) ||

(effective\_X == 9'd6 && effective\_Y == 8'd18) || (effective\_X == 9'd6 && effective\_Y == 8'd19) || (effective\_X == 9'd6 && effective\_Y == 8'd27) || (effective\_X == 9'd6 && effective\_Y == 8'd28) || (effective\_X == 9'd6 && effective\_Y == 8'd37) || (effective\_X == 9'd6 && effective\_Y == 8'd38) ||

(effective\_X == 9'd7 && effective\_Y == 8'd18) || (effective\_X == 9'd7 && effective\_Y == 8'd19) || (effective\_X == 9'd7 && effective\_Y == 8'd27) || (effective\_X == 9'd7 && effective\_Y == 8'd28) || (effective\_X == 9'd7 && effective\_Y == 8'd37) || (effective\_X == 9'd7 && effective\_Y == 8'd38) ||

(effective\_X == 9'd8 && effective\_Y == 8'd18) || (effective\_X == 9'd8 && effective\_Y == 8'd19) || (effective\_X == 9'd8 && effective\_Y == 8'd27) || (effective\_X == 9'd8 && effective\_Y == 8'd28) || (effective\_X == 9'd8 && effective\_Y == 8'd37) || (effective\_X == 9'd8 && effective\_Y == 8'd38) ||

(effective\_X == 9'd9 && effective\_Y == 8'd18) || (effective\_X == 9'd9 && effective\_Y == 8'd19) || (effective\_X == 9'd9 && effective\_Y == 8'd27) || (effective\_X == 9'd9 && effective\_Y == 8'd28) || (effective\_X == 9'd9 && effective\_Y == 8'd37) || (effective\_X == 9'd9 && effective\_Y == 8'd38) ||

(effective\_X == 9'd10 && effective\_Y == 8'd18) || (effective\_X == 9'd10 && effective\_Y == 8'd19) || (effective\_X == 9'd10 && effective\_Y == 8'd27) || (effective\_X == 9'd10 && effective\_Y == 8'd28) || (effective\_X == 9'd10 && effective\_Y == 8'd37) || (effective\_X == 9'd10 && effective\_Y == 8'd38) ||

(effective\_X == 9'd11 && effective\_Y == 8'd18) || (effective\_X == 9'd11 && effective\_Y == 8'd19) || (effective\_X == 9'd11 && effective\_Y == 8'd20) || (effective\_X == 9'd11 && effective\_Y == 8'd21) || (effective\_X == 9'd11 && effective\_Y == 8'd22) || (effective\_X == 9'd11 && effective\_Y == 8'd23) || (effective\_X == 9'd11 && effective\_Y == 8'd24) || (effective\_X == 9'd11 && effective\_Y == 8'd25) || (effective\_X == 9'd11 && effective\_Y == 8'd26) || (effective\_X == 9'd11 && effective\_Y == 8'd27) || (effective\_X == 9'd11 && effective\_Y == 8'd28) || (effective\_X == 9'd11 && effective\_Y == 8'd37) || (effective\_X == 9'd11 && effective\_Y == 8'd38) ||

(effective\_X == 9'd12 && effective\_Y == 8'd18) || (effective\_X == 9'd12 && effective\_Y == 8'd19) || (effective\_X == 9'd12 && effective\_Y == 8'd20) || (effective\_X == 9'd12 && effective\_Y == 8'd21) || (effective\_X == 9'd12 && effective\_Y == 8'd22) || (effective\_X == 9'd12 && effective\_Y == 8'd23) || (effective\_X == 9'd12 && effective\_Y == 8'd24) || (effective\_X == 9'd12 && effective\_Y == 8'd25) || (effective\_X == 9'd12 && effective\_Y == 8'd26) || (effective\_X == 9'd12 && effective\_Y == 8'd27) || (effective\_X == 9'd12 && effective\_Y == 8'd28) || (effective\_X == 9'd12 && effective\_Y == 8'd37) || (effective\_X == 9'd12 && effective\_Y == 8'd38) ||

(effective\_X == 9'd15 && effective\_Y == 8'd18) || (effective\_X == 9'd15 && effective\_Y == 8'd19) || (effective\_X == 9'd15 && effective\_Y == 8'd20) || (effective\_X == 9'd15 && effective\_Y == 8'd21) || (effective\_X == 9'd15 && effective\_Y == 8'd22) || (effective\_X == 9'd15 && effective\_Y == 8'd23) || (effective\_X == 9'd15 && effective\_Y == 8'd24) || (effective\_X == 9'd15 && effective\_Y == 8'd25) || (effective\_X == 9'd15 && effective\_Y == 8'd26) || (effective\_X == 9'd15 && effective\_Y == 8'd27) || (effective\_X == 9'd15 && effective\_Y == 8'd28) || (effective\_X == 9'd15 && effective\_Y == 8'd29) || (effective\_X == 9'd15 && effective\_Y == 8'd30) || (effective\_X == 9'd15 && effective\_Y == 8'd31) || (effective\_X == 9'd15 && effective\_Y == 8'd32) || (effective\_X == 9'd15 && effective\_Y == 8'd33) || (effective\_X == 9'd15 && effective\_Y == 8'd34) || (effective\_X == 9'd15 && effective\_Y == 8'd35) || (effective\_X == 9'd15 && effective\_Y == 8'd36) || (effective\_X == 9'd15 && effective\_Y == 8'd37) || (effective\_X == 9'd15 && effective\_Y == 8'd38) ||

(effective\_X == 9'd16 && effective\_Y == 8'd18) || (effective\_X == 9'd16 && effective\_Y == 8'd19) || (effective\_X == 9'd16 && effective\_Y == 8'd20) || (effective\_X == 9'd16 && effective\_Y == 8'd21) || (effective\_X == 9'd16 && effective\_Y == 8'd22) || (effective\_X == 9'd16 && effective\_Y == 8'd23) || (effective\_X == 9'd16 && effective\_Y == 8'd24) || (effective\_X == 9'd16 && effective\_Y == 8'd25) || (effective\_X == 9'd16 && effective\_Y == 8'd26) || (effective\_X == 9'd16 && effective\_Y == 8'd27) || (effective\_X == 9'd16 && effective\_Y == 8'd28) || (effective\_X == 9'd16 && effective\_Y == 8'd29) || (effective\_X == 9'd16 && effective\_Y == 8'd30) || (effective\_X == 9'd16 && effective\_Y == 8'd31) || (effective\_X == 9'd16 && effective\_Y == 8'd32) || (effective\_X == 9'd16 && effective\_Y == 8'd33) || (effective\_X == 9'd16 && effective\_Y == 8'd34) || (effective\_X == 9'd16 && effective\_Y == 8'd35) || (effective\_X == 9'd16 && effective\_Y == 8'd36) || (effective\_X == 9'd16 && effective\_Y == 8'd37) || (effective\_X == 9'd16 && effective\_Y == 8'd38) ||

(effective\_X == 9'd17 && effective\_Y == 8'd18) || (effective\_X == 9'd17 && effective\_Y == 8'd19) || (effective\_X == 9'd17 && effective\_Y == 8'd37) || (effective\_X == 9'd17 && effective\_Y == 8'd38) ||

(effective\_X == 9'd18 && effective\_Y == 8'd18) || (effective\_X == 9'd18 && effective\_Y == 8'd19) || (effective\_X == 9'd18 && effective\_Y == 8'd37) || (effective\_X == 9'd18 && effective\_Y == 8'd38) ||

(effective\_X == 9'd19 && effective\_Y == 8'd18) || (effective\_X == 9'd19 && effective\_Y == 8'd19) || (effective\_X == 9'd19 && effective\_Y == 8'd37) || (effective\_X == 9'd19 && effective\_Y == 8'd38) ||

(effective\_X == 9'd20 && effective\_Y == 8'd18) || (effective\_X == 9'd20 && effective\_Y == 8'd19) || (effective\_X == 9'd20 && effective\_Y == 8'd37) || (effective\_X == 9'd20 && effective\_Y == 8'd38) ||

(effective\_X == 9'd21 && effective\_Y == 8'd18) || (effective\_X == 9'd21 && effective\_Y == 8'd19) || (effective\_X == 9'd21 && effective\_Y == 8'd37) || (effective\_X == 9'd21 && effective\_Y == 8'd38) ||

(effective\_X == 9'd22 && effective\_Y == 8'd18) || (effective\_X == 9'd22 && effective\_Y == 8'd19) || (effective\_X == 9'd22 && effective\_Y == 8'd37) || (effective\_X == 9'd22 && effective\_Y == 8'd38) ||

(effective\_X == 9'd23 && effective\_Y == 8'd18) || (effective\_X == 9'd23 && effective\_Y == 8'd19) || (effective\_X == 9'd23 && effective\_Y == 8'd37) || (effective\_X == 9'd23 && effective\_Y == 8'd38) ||

(effective\_X == 9'd24 && effective\_Y == 8'd18) || (effective\_X == 9'd24 && effective\_Y == 8'd19) || (effective\_X == 9'd24 && effective\_Y == 8'd37) || (effective\_X == 9'd24 && effective\_Y == 8'd38) ||

(effective\_X == 9'd25 && effective\_Y == 8'd18) || (effective\_X == 9'd25 && effective\_Y == 8'd19) || (effective\_X == 9'd25 && effective\_Y == 8'd20) || (effective\_X == 9'd25 && effective\_Y == 8'd21) || (effective\_X == 9'd25 && effective\_Y == 8'd22) || (effective\_X == 9'd25 && effective\_Y == 8'd23) || (effective\_X == 9'd25 && effective\_Y == 8'd24) || (effective\_X == 9'd25 && effective\_Y == 8'd25) || (effective\_X == 9'd25 && effective\_Y == 8'd26) || (effective\_X == 9'd25 && effective\_Y == 8'd27) || (effective\_X == 9'd25 && effective\_Y == 8'd28) || (effective\_X == 9'd25 && effective\_Y == 8'd29) || (effective\_X == 9'd25 && effective\_Y == 8'd30) || (effective\_X == 9'd25 && effective\_Y == 8'd31) || (effective\_X == 9'd25 && effective\_Y == 8'd32) || (effective\_X == 9'd25 && effective\_Y == 8'd33) || (effective\_X == 9'd25 && effective\_Y == 8'd34) || (effective\_X == 9'd25 && effective\_Y == 8'd35) || (effective\_X == 9'd25 && effective\_Y == 8'd36) || (effective\_X == 9'd25 && effective\_Y == 8'd37) || (effective\_X == 9'd25 && effective\_Y == 8'd38) ||

(effective\_X == 9'd26 && effective\_Y == 8'd18) || (effective\_X == 9'd26 && effective\_Y == 8'd19) || (effective\_X == 9'd26 && effective\_Y == 8'd20) || (effective\_X == 9'd26 && effective\_Y == 8'd21) || (effective\_X == 9'd26 && effective\_Y == 8'd22) || (effective\_X == 9'd26 && effective\_Y == 8'd23) || (effective\_X == 9'd26 && effective\_Y == 8'd24) || (effective\_X == 9'd26 && effective\_Y == 8'd25) || (effective\_X == 9'd26 && effective\_Y == 8'd26) || (effective\_X == 9'd26 && effective\_Y == 8'd27) || (effective\_X == 9'd26 && effective\_Y == 8'd28) || (effective\_X == 9'd26 && effective\_Y == 8'd29) || (effective\_X == 9'd26 && effective\_Y == 8'd30) || (effective\_X == 9'd26 && effective\_Y == 8'd31) || (effective\_X == 9'd26 && effective\_Y == 8'd32) || (effective\_X == 9'd26 && effective\_Y == 8'd33) || (effective\_X == 9'd26 && effective\_Y == 8'd34) || (effective\_X == 9'd26 && effective\_Y == 8'd35) || (effective\_X == 9'd26 && effective\_Y == 8'd36) || (effective\_X == 9'd26 && effective\_Y == 8'd37) || (effective\_X == 9'd26 && effective\_Y == 8'd38) ||

(effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd20) || (effective\_X == 9'd29 && effective\_Y == 8'd21) || (effective\_X == 9'd29 && effective\_Y == 8'd22) || (effective\_X == 9'd29 && effective\_Y == 8'd23) || (effective\_X == 9'd29 && effective\_Y == 8'd24) || (effective\_X == 9'd29 && effective\_Y == 8'd25) || (effective\_X == 9'd29 && effective\_Y == 8'd26) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd20) || (effective\_X == 9'd30 && effective\_Y == 8'd21) || (effective\_X == 9'd30 && effective\_Y == 8'd22) || (effective\_X == 9'd30 && effective\_Y == 8'd23) || (effective\_X == 9'd30 && effective\_Y == 8'd24) || (effective\_X == 9'd30 && effective\_Y == 8'd25) || (effective\_X == 9'd30 && effective\_Y == 8'd26) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) ||

(effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) ||

(effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) ||

(effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) ||

(effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) ||

(effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) ||

(effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) ||

(effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) ||

(effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[6:4]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[6:4])) : 3'b111;

end

end

// if (highscore == 12'd4096) begin

// if(effective\_X == 6'd1 && effective\_Y == 6'd1 ||

// effective\_X == 6'd2 && effective\_Y == 6'd2 ||

// effective\_X == 6'd3 && effective\_Y == 6'd3 ||

// effective\_X == 6'd4 && effective\_Y == 6'd4 ||

// effective\_X == 6'd5 && effective\_Y == 6'd5 ||

// effective\_X == 6'd6 && effective\_Y == 6'd6 ||

// effective\_X == 6'd7 && effective\_Y == 6'd7 ||

// effective\_X == 6'd8 && effective\_Y == 6'd8 ||

// effective\_X == 6'd9 && effective\_Y == 6'd9 ||

// effective\_X == 6'd10 && effective\_Y == 6'd10 ||

// effective\_X == 6'd11 && effective\_Y == 6'd11 ||

// effective\_X == 6'd12 && effective\_Y == 6'd12) begin

// pixel\_colour = 3'b111;

// end

// end

end

end

else begin

if ((screen\_X == 9'd38 && screen\_Y == 8'd24) ||

(screen\_X == 9'd38 && screen\_Y == 8'd25) ||

(screen\_X == 9'd38 && screen\_Y == 8'd26) ||

(screen\_X == 9'd38 && screen\_Y == 8'd27) ||

(screen\_X == 9'd38 && screen\_Y == 8'd28) ||

(screen\_X == 9'd38 && screen\_Y == 8'd29) ||

(screen\_X == 9'd38 && screen\_Y == 8'd30) ||

(screen\_X == 9'd38 && screen\_Y == 8'd31) ||

(screen\_X == 9'd38 && screen\_Y == 8'd32) ||

(screen\_X == 9'd38 && screen\_Y == 8'd33) ||

(screen\_X == 9'd38 && screen\_Y == 8'd34) ||

(screen\_X == 9'd38 && screen\_Y == 8'd35) ||

(screen\_X == 9'd38 && screen\_Y == 8'd36) ||

(screen\_X == 9'd38 && screen\_Y == 8'd37) ||

(screen\_X == 9'd38 && screen\_Y == 8'd38) ||

(screen\_X == 9'd38 && screen\_Y == 8'd39) ||

(screen\_X == 9'd38 && screen\_Y == 8'd40) ||

(screen\_X == 9'd38 && screen\_Y == 8'd41) ||

(screen\_X == 9'd38 && screen\_Y == 8'd42) ||

(screen\_X == 9'd38 && screen\_Y == 8'd43) ||

(screen\_X == 9'd38 && screen\_Y == 8'd44) ||

(screen\_X == 9'd38 && screen\_Y == 8'd45) ||

(screen\_X == 9'd38 && screen\_Y == 8'd46) ||

(screen\_X == 9'd38 && screen\_Y == 8'd47) ||

(screen\_X == 9'd38 && screen\_Y == 8'd48) ||

(screen\_X == 9'd38 && screen\_Y == 8'd49) ||

(screen\_X == 9'd38 && screen\_Y == 8'd50) ||

(screen\_X == 9'd38 && screen\_Y == 8'd51) ||

(screen\_X == 9'd38 && screen\_Y == 8'd52) ||

(screen\_X == 9'd38 && screen\_Y == 8'd53) ||

(screen\_X == 9'd38 && screen\_Y == 8'd54) ||

(screen\_X == 9'd38 && screen\_Y == 8'd55) ||

(screen\_X == 9'd39 && screen\_Y == 8'd55) ||

(screen\_X == 9'd40 && screen\_Y == 8'd55) ||

(screen\_X == 9'd41 && screen\_Y == 8'd55) ||

(screen\_X == 9'd42 && screen\_Y == 8'd55) ||

(screen\_X == 9'd43 && screen\_Y == 8'd55) ||

(screen\_X == 9'd44 && screen\_Y == 8'd55) ||

(screen\_X == 9'd45 && screen\_Y == 8'd55) ||

(screen\_X == 9'd46 && screen\_Y == 8'd55) ||

(screen\_X == 9'd47 && screen\_Y == 8'd55) ||

(screen\_X == 9'd48 && screen\_Y == 8'd55) ||

(screen\_X == 9'd49 && screen\_Y == 8'd55) ||

(screen\_X == 9'd50 && screen\_Y == 8'd55) ||

(screen\_X == 9'd51 && screen\_Y == 8'd55) ||

(screen\_X == 9'd52 && screen\_Y == 8'd55) ||

(screen\_X == 9'd53 && screen\_Y == 8'd55) ||

(screen\_X == 9'd54 && screen\_Y == 8'd55) ||

(screen\_X == 9'd55 && screen\_Y == 8'd55) ||

(screen\_X == 9'd56 && screen\_Y == 8'd55) ||

(screen\_X == 9'd57 && screen\_Y == 8'd55) ||

(screen\_X == 9'd58 && screen\_Y == 8'd55) ||

(screen\_X == 9'd59 && screen\_Y == 8'd55) ||

(screen\_X == 9'd60 && screen\_Y == 8'd55) ||

(screen\_X == 9'd61 && screen\_Y == 8'd55) ||

(screen\_X == 9'd62 && screen\_Y == 8'd55) ||

(screen\_X == 9'd63 && screen\_Y == 8'd55) ||

(screen\_X == 9'd64 && screen\_Y == 8'd55) ||

(screen\_X == 9'd65 && screen\_Y == 8'd55) ||

(screen\_X == 9'd39 && screen\_Y == 8'd97) ||

(screen\_X == 9'd40 && screen\_Y == 8'd97) ||

(screen\_X == 9'd41 && screen\_Y == 8'd97) ||

(screen\_X == 9'd42 && screen\_Y == 8'd97) ||

(screen\_X == 9'd43 && screen\_Y == 8'd97) ||

(screen\_X == 9'd44 && screen\_Y == 8'd97) ||

(screen\_X == 9'd45 && screen\_Y == 8'd97) ||

(screen\_X == 9'd46 && screen\_Y == 8'd97) ||

(screen\_X == 9'd47 && screen\_Y == 8'd97) ||

(screen\_X == 9'd48 && screen\_Y == 8'd97) ||

(screen\_X == 9'd49 && screen\_Y == 8'd97) ||

(screen\_X == 9'd50 && screen\_Y == 8'd97) ||

(screen\_X == 9'd51 && screen\_Y == 8'd97) ||

(screen\_X == 9'd52 && screen\_Y == 8'd97) ||

(screen\_X == 9'd53 && screen\_Y == 8'd97) ||

(screen\_X == 9'd54 && screen\_Y == 8'd97) ||

(screen\_X == 9'd55 && screen\_Y == 8'd97) ||

(screen\_X == 9'd56 && screen\_Y == 8'd97) ||

(screen\_X == 9'd57 && screen\_Y == 8'd97) ||

(screen\_X == 9'd58 && screen\_Y == 8'd97) ||

(screen\_X == 9'd59 && screen\_Y == 8'd97) ||

(screen\_X == 9'd60 && screen\_Y == 8'd97) ||

(screen\_X == 9'd61 && screen\_Y == 8'd97) ||

(screen\_X == 9'd62 && screen\_Y == 8'd97) ||

(screen\_X == 9'd63 && screen\_Y == 8'd97) ||

(screen\_X == 9'd64 && screen\_Y == 8'd97) ||

(screen\_X == 9'd65 && screen\_Y == 8'd97) ||

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(screen\_X == 9'd66 && screen\_Y == 8'd25) ||

(screen\_X == 9'd66 && screen\_Y == 8'd26) ||

(screen\_X == 9'd66 && screen\_Y == 8'd27) ||

(screen\_X == 9'd66 && screen\_Y == 8'd28) ||

(screen\_X == 9'd66 && screen\_Y == 8'd29) ||

(screen\_X == 9'd66 && screen\_Y == 8'd30) ||

(screen\_X == 9'd66 && screen\_Y == 8'd31) ||

(screen\_X == 9'd66 && screen\_Y == 8'd32) ||

(screen\_X == 9'd66 && screen\_Y == 8'd33) ||

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(screen\_X == 9'd66 && screen\_Y == 8'd39) ||

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(screen\_X == 9'd66 && screen\_Y == 8'd50) ||

(screen\_X == 9'd66 && screen\_Y == 8'd51) ||

(screen\_X == 9'd66 && screen\_Y == 8'd52) ||

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(screen\_X == 9'd66 && screen\_Y == 8'd54) ||

(screen\_X == 9'd66 && screen\_Y == 8'd55) ||

(screen\_X == 9'd66 && screen\_Y == 8'd56) ||

(screen\_X == 9'd66 && screen\_Y == 8'd57) ||

(screen\_X == 9'd66 && screen\_Y == 8'd58) ||

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(screen\_X == 9'd66 && screen\_Y == 8'd61) ||

(screen\_X == 9'd66 && screen\_Y == 8'd62) ||

(screen\_X == 9'd66 && screen\_Y == 8'd63) ||

(screen\_X == 9'd66 && screen\_Y == 8'd64) ||

(screen\_X == 9'd66 && screen\_Y == 8'd65) ||

(screen\_X == 9'd66 && screen\_Y == 8'd66) ||

(screen\_X == 9'd66 && screen\_Y == 8'd67) ||

(screen\_X == 9'd66 && screen\_Y == 8'd68) ||

(screen\_X == 9'd66 && screen\_Y == 8'd69) ||

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(screen\_X == 9'd66 && screen\_Y == 8'd71) ||

(screen\_X == 9'd66 && screen\_Y == 8'd72) ||

(screen\_X == 9'd66 && screen\_Y == 8'd73) ||

(screen\_X == 9'd66 && screen\_Y == 8'd74) ||

(screen\_X == 9'd66 && screen\_Y == 8'd75) ||

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(screen\_X == 9'd66 && screen\_Y == 8'd77) ||

(screen\_X == 9'd66 && screen\_Y == 8'd78) ||

(screen\_X == 9'd66 && screen\_Y == 8'd79) ||

(screen\_X == 9'd66 && screen\_Y == 8'd80) ||

(screen\_X == 9'd66 && screen\_Y == 8'd81) ||

(screen\_X == 9'd66 && screen\_Y == 8'd82) ||

(screen\_X == 9'd66 && screen\_Y == 8'd83) ||

(screen\_X == 9'd66 && screen\_Y == 8'd84) ||

(screen\_X == 9'd66 && screen\_Y == 8'd85) ||

(screen\_X == 9'd66 && screen\_Y == 8'd86) ||

(screen\_X == 9'd66 && screen\_Y == 8'd87) ||

(screen\_X == 9'd66 && screen\_Y == 8'd88) ||

(screen\_X == 9'd66 && screen\_Y == 8'd89) ||

(screen\_X == 9'd66 && screen\_Y == 8'd90) ||

(screen\_X == 9'd66 && screen\_Y == 8'd91) ||

(screen\_X == 9'd66 && screen\_Y == 8'd92) ||

(screen\_X == 9'd66 && screen\_Y == 8'd93) ||

(screen\_X == 9'd66 && screen\_Y == 8'd94) ||

(screen\_X == 9'd66 && screen\_Y == 8'd95) ||

(screen\_X == 9'd66 && screen\_Y == 8'd96) ||

(screen\_X == 9'd66 && screen\_Y == 8'd97)

) begin // Y

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[9:7]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[9:7])) : 3'b111;

end

if ((screen\_X == 9'd90 && screen\_Y == 8'd37) ||

(screen\_X == 9'd90 && screen\_Y == 8'd38) ||

(screen\_X == 9'd90 && screen\_Y == 8'd39) ||

(screen\_X == 9'd90 && screen\_Y == 8'd40) ||

(screen\_X == 9'd90 && screen\_Y == 8'd41) ||

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(screen\_X == 9'd90 && screen\_Y == 8'd51) ||

(screen\_X == 9'd90 && screen\_Y == 8'd52) ||

(screen\_X == 9'd90 && screen\_Y == 8'd53) ||

(screen\_X == 9'd90 && screen\_Y == 8'd54) ||

(screen\_X == 9'd90 && screen\_Y == 8'd55) ||

(screen\_X == 9'd90 && screen\_Y == 8'd56) ||

(screen\_X == 9'd90 && screen\_Y == 8'd57) ||

(screen\_X == 9'd90 && screen\_Y == 8'd58) ||

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(screen\_X == 9'd90 && screen\_Y == 8'd60) ||

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(screen\_X == 9'd90 && screen\_Y == 8'd62) ||

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(screen\_X == 9'd90 && screen\_Y == 8'd66) ||

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(screen\_X == 9'd90 && screen\_Y == 8'd70) ||

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(screen\_X == 9'd90 && screen\_Y == 8'd89) ||

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(screen\_X == 9'd119 && screen\_Y == 8'd44) ||

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(screen\_X == 9'd119 && screen\_Y == 8'd47) ||

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(screen\_X == 9'd119 && screen\_Y == 8'd54) ||

(screen\_X == 9'd119 && screen\_Y == 8'd55) ||

(screen\_X == 9'd119 && screen\_Y == 8'd56) ||

(screen\_X == 9'd119 && screen\_Y == 8'd57) ||

(screen\_X == 9'd119 && screen\_Y == 8'd58) ||

(screen\_X == 9'd119 && screen\_Y == 8'd59) ||

(screen\_X == 9'd119 && screen\_Y == 8'd60) ||

(screen\_X == 9'd119 && screen\_Y == 8'd61) ||

(screen\_X == 9'd119 && screen\_Y == 8'd62) ||

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(screen\_X == 9'd119 && screen\_Y == 8'd65) ||

(screen\_X == 9'd119 && screen\_Y == 8'd66) ||

(screen\_X == 9'd119 && screen\_Y == 8'd67) ||

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(screen\_X == 9'd119 && screen\_Y == 8'd73) ||

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(screen\_X == 9'd93 && screen\_Y == 8'd39) ||

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(screen\_X == 9'd103 && screen\_Y == 8'd39) ||

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(screen\_X == 9'd105 && screen\_Y == 8'd39) ||

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(screen\_X == 9'd107 && screen\_Y == 8'd39) ||

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(screen\_X == 9'd109 && screen\_Y == 8'd39) ||

(screen\_X == 9'd110 && screen\_Y == 8'd39) ||

(screen\_X == 9'd111 && screen\_Y == 8'd39) ||

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(screen\_X == 9'd113 && screen\_Y == 8'd39) ||

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(screen\_X == 9'd115 && screen\_Y == 8'd39) ||

(screen\_X == 9'd116 && screen\_Y == 8'd39) ||

(screen\_X == 9'd117 && screen\_Y == 8'd39) ||

(screen\_X == 9'd118 && screen\_Y == 8'd39) ||

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(screen\_X == 9'd101 && screen\_Y == 8'd89) ||

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(screen\_X == 9'd107 && screen\_Y == 8'd89) ||

(screen\_X == 9'd108 && screen\_Y == 8'd89) ||

(screen\_X == 9'd109 && screen\_Y == 8'd89) ||

(screen\_X == 9'd110 && screen\_Y == 8'd89) ||

(screen\_X == 9'd111 && screen\_Y == 8'd89) ||

(screen\_X == 9'd112 && screen\_Y == 8'd89) ||

(screen\_X == 9'd113 && screen\_Y == 8'd89) ||

(screen\_X == 9'd114 && screen\_Y == 8'd89) ||

(screen\_X == 9'd115 && screen\_Y == 8'd89) ||

(screen\_X == 9'd116 && screen\_Y == 8'd89) ||

(screen\_X == 9'd117 && screen\_Y == 8'd89) ||

(screen\_X == 9'd118 && screen\_Y == 8'd89)

) begin // O

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[6:4]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[6:4])) : 3'b111;

end

if ((screen\_X == 9'd145 && screen\_Y == 8'd37) ||

(screen\_X == 9'd145 && screen\_Y == 8'd38) ||

(screen\_X == 9'd145 && screen\_Y == 8'd39) ||

(screen\_X == 9'd145 && screen\_Y == 8'd40) ||

(screen\_X == 9'd145 && screen\_Y == 8'd41) ||

(screen\_X == 9'd145 && screen\_Y == 8'd42) ||

(screen\_X == 9'd145 && screen\_Y == 8'd43) ||

(screen\_X == 9'd145 && screen\_Y == 8'd44) ||

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(screen\_X == 9'd145 && screen\_Y == 8'd46) ||

(screen\_X == 9'd145 && screen\_Y == 8'd47) ||

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(screen\_X == 9'd145 && screen\_Y == 8'd49) ||

(screen\_X == 9'd145 && screen\_Y == 8'd50) ||

(screen\_X == 9'd145 && screen\_Y == 8'd51) ||

(screen\_X == 9'd145 && screen\_Y == 8'd52) ||

(screen\_X == 9'd145 && screen\_Y == 8'd53) ||

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(screen\_X == 9'd182 && screen\_Y == 8'd42) ||

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(screen\_X == 9'd182 && screen\_Y == 8'd54) ||

(screen\_X == 9'd182 && screen\_Y == 8'd55) ||

(screen\_X == 9'd182 && screen\_Y == 8'd56) ||

(screen\_X == 9'd182 && screen\_Y == 8'd57) ||

(screen\_X == 9'd182 && screen\_Y == 8'd58) ||

(screen\_X == 9'd182 && screen\_Y == 8'd59) ||

(screen\_X == 9'd182 && screen\_Y == 8'd60) ||

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(screen\_X == 9'd182 && screen\_Y == 8'd81) ||

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(screen\_X == 9'd182 && screen\_Y == 8'd87) ||

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(screen\_X == 9'd182 && screen\_Y == 8'd91) ||

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(screen\_X == 9'd163 && screen\_Y == 8'd89) ||

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(screen\_X == 9'd179 && screen\_Y == 8'd89) ||

(screen\_X == 9'd180 && screen\_Y == 8'd89) ||

(screen\_X == 9'd181 && screen\_Y == 8'd89)

) begin // U

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[2:0]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[2:0])) : 3'b111;

end

if ((screen\_X == 9'd27 && screen\_Y == 8'd120) ||

(screen\_X == 9'd27 && screen\_Y == 8'd121) ||

(screen\_X == 9'd27 && screen\_Y == 8'd122) ||

(screen\_X == 9'd27 && screen\_Y == 8'd123) ||

(screen\_X == 9'd27 && screen\_Y == 8'd124) ||

(screen\_X == 9'd27 && screen\_Y == 8'd125) ||

(screen\_X == 9'd27 && screen\_Y == 8'd126) ||

(screen\_X == 9'd27 && screen\_Y == 8'd127) ||

(screen\_X == 9'd27 && screen\_Y == 8'd128) ||

(screen\_X == 9'd27 && screen\_Y == 8'd129) ||

(screen\_X == 9'd27 && screen\_Y == 8'd130) ||

(screen\_X == 9'd27 && screen\_Y == 8'd131) ||

(screen\_X == 9'd27 && screen\_Y == 8'd132) ||

(screen\_X == 9'd27 && screen\_Y == 8'd133) ||

(screen\_X == 9'd27 && screen\_Y == 8'd134) ||

(screen\_X == 9'd27 && screen\_Y == 8'd135) ||

(screen\_X == 9'd27 && screen\_Y == 8'd136) ||

(screen\_X == 9'd27 && screen\_Y == 8'd137) ||

(screen\_X == 9'd27 && screen\_Y == 8'd138) ||

(screen\_X == 9'd27 && screen\_Y == 8'd139) ||

(screen\_X == 9'd27 && screen\_Y == 8'd140) ||

(screen\_X == 9'd27 && screen\_Y == 8'd141) ||

(screen\_X == 9'd27 && screen\_Y == 8'd142) ||

(screen\_X == 9'd27 && screen\_Y == 8'd143) ||

(screen\_X == 9'd27 && screen\_Y == 8'd144) ||

(screen\_X == 9'd27 && screen\_Y == 8'd145) ||

(screen\_X == 9'd27 && screen\_Y == 8'd146) ||

(screen\_X == 9'd27 && screen\_Y == 8'd147) ||

(screen\_X == 9'd27 && screen\_Y == 8'd148) ||

(screen\_X == 9'd27 && screen\_Y == 8'd149) ||

(screen\_X == 9'd27 && screen\_Y == 8'd150) ||

(screen\_X == 9'd27 && screen\_Y == 8'd151) ||

(screen\_X == 9'd27 && screen\_Y == 8'd152) ||

(screen\_X == 9'd27 && screen\_Y == 8'd153) ||

(screen\_X == 9'd27 && screen\_Y == 8'd154) ||

(screen\_X == 9'd27 && screen\_Y == 8'd155) ||

(screen\_X == 9'd27 && screen\_Y == 8'd156) ||

(screen\_X == 9'd27 && screen\_Y == 8'd157) ||

(screen\_X == 9'd27 && screen\_Y == 8'd158) ||

(screen\_X == 9'd27 && screen\_Y == 8'd159) ||

(screen\_X == 9'd27 && screen\_Y == 8'd160) ||

(screen\_X == 9'd27 && screen\_Y == 8'd161) ||

(screen\_X == 9'd27 && screen\_Y == 8'd162) ||

(screen\_X == 9'd27 && screen\_Y == 8'd163) ||

(screen\_X == 9'd27 && screen\_Y == 8'd164) ||

(screen\_X == 9'd27 && screen\_Y == 8'd165) ||

(screen\_X == 9'd27 && screen\_Y == 8'd166) ||

(screen\_X == 9'd27 && screen\_Y == 8'd167) ||

(screen\_X == 9'd27 && screen\_Y == 8'd168) ||

(screen\_X == 9'd27 && screen\_Y == 8'd169) ||

(screen\_X == 9'd27 && screen\_Y == 8'd170) ||

(screen\_X == 9'd27 && screen\_Y == 8'd171) ||

(screen\_X == 9'd27 && screen\_Y == 8'd172) ||

(screen\_X == 9'd27 && screen\_Y == 8'd173) ||

(screen\_X == 9'd27 && screen\_Y == 8'd174) ||

(screen\_X == 9'd27 && screen\_Y == 8'd175) ||

(screen\_X == 9'd27 && screen\_Y == 8'd176) ||

(screen\_X == 9'd27 && screen\_Y == 8'd177) ||

(screen\_X == 9'd27 && screen\_Y == 8'd178) ||

(screen\_X == 9'd27 && screen\_Y == 8'd179) ||

(screen\_X == 9'd27 && screen\_Y == 8'd180) ||

(screen\_X == 9'd27 && screen\_Y == 8'd181) ||

(screen\_X == 9'd27 && screen\_Y == 8'd182) ||

(screen\_X == 9'd27 && screen\_Y == 8'd183) ||

(screen\_X == 9'd27 && screen\_Y == 8'd184) ||

(screen\_X == 9'd27 && screen\_Y == 8'd185) ||

(screen\_X == 9'd27 && screen\_Y == 8'd186) ||

(screen\_X == 9'd27 && screen\_Y == 8'd187) ||

(screen\_X == 9'd27 && screen\_Y == 8'd188) ||

(screen\_X == 9'd27 && screen\_Y == 8'd189) ||

(screen\_X == 9'd27 && screen\_Y == 8'd190) ||

(screen\_X == 9'd27 && screen\_Y == 8'd191) ||

(screen\_X == 9'd27 && screen\_Y == 8'd192) ||

(screen\_X == 9'd27 && screen\_Y == 8'd193) ||

(screen\_X == 9'd27 && screen\_Y == 8'd194) ||

(screen\_X == 9'd27 && screen\_Y == 8'd195) ||

(screen\_X == 9'd27 && screen\_Y == 8'd196) ||

(screen\_X == 9'd27 && screen\_Y == 8'd197) ||

(screen\_X == 9'd27 && screen\_Y == 8'd198) ||

(screen\_X == 9'd27 && screen\_Y == 8'd199) ||

(screen\_X == 9'd27 && screen\_Y == 8'd200) ||

(screen\_X == 9'd27 && screen\_Y == 8'd201) ||

(screen\_X == 9'd27 && screen\_Y == 8'd202) ||

(screen\_X == 9'd27 && screen\_Y == 8'd203) ||

(screen\_X == 9'd27 && screen\_Y == 8'd204) ||

(screen\_X == 9'd27 && screen\_Y == 8'd205) ||

(screen\_X == 9'd27 && screen\_Y == 8'd206) ||

(screen\_X == 9'd27 && screen\_Y == 8'd207) ||

(screen\_X == 9'd27 && screen\_Y == 8'd208) ||

(screen\_X == 9'd27 && screen\_Y == 8'd209) ||

(screen\_X == 9'd27 && screen\_Y == 8'd210) ||

(screen\_X == 9'd27 && screen\_Y == 8'd211) ||

(screen\_X == 9'd28 && screen\_Y == 8'd211) ||

(screen\_X == 9'd29 && screen\_Y == 8'd211) ||

(screen\_X == 9'd30 && screen\_Y == 8'd211) ||

(screen\_X == 9'd31 && screen\_Y == 8'd211) ||

(screen\_X == 9'd32 && screen\_Y == 8'd211) ||

(screen\_X == 9'd33 && screen\_Y == 8'd211) ||

(screen\_X == 9'd34 && screen\_Y == 8'd211) ||

(screen\_X == 9'd35 && screen\_Y == 8'd211) ||

(screen\_X == 9'd36 && screen\_Y == 8'd211) ||

(screen\_X == 9'd37 && screen\_Y == 8'd211) ||

(screen\_X == 9'd38 && screen\_Y == 8'd211) ||

(screen\_X == 9'd39 && screen\_Y == 8'd211) ||

(screen\_X == 9'd40 && screen\_Y == 8'd211) ||

(screen\_X == 9'd41 && screen\_Y == 8'd211) ||

(screen\_X == 9'd42 && screen\_Y == 8'd211) ||

(screen\_X == 9'd43 && screen\_Y == 8'd211) ||

(screen\_X == 9'd44 && screen\_Y == 8'd211) ||

(screen\_X == 9'd45 && screen\_Y == 8'd211) ||

(screen\_X == 9'd46 && screen\_Y == 8'd211) ||

(screen\_X == 9'd47 && screen\_Y == 8'd211) ||

(screen\_X == 9'd48 && screen\_Y == 8'd211) ||

(screen\_X == 9'd49 && screen\_Y == 8'd211) ||

(screen\_X == 9'd50 && screen\_Y == 8'd211) ||

(screen\_X == 9'd51 && screen\_Y == 8'd211) ||

(screen\_X == 9'd52 && screen\_Y == 8'd211) ||

(screen\_X == 9'd53 && screen\_Y == 8'd211) ||

(screen\_X == 9'd54 && screen\_Y == 8'd211) ||

(screen\_X == 9'd55 && screen\_Y == 8'd211) ||

(screen\_X == 9'd56 && screen\_Y == 8'd211) ||

(screen\_X == 9'd57 && screen\_Y == 8'd211) ||

(screen\_X == 9'd58 && screen\_Y == 8'd211) ||

(screen\_X == 9'd59 && screen\_Y == 8'd211) ||

(screen\_X == 9'd60 && screen\_Y == 8'd211) ||

(screen\_X == 9'd61 && screen\_Y == 8'd211) ||

(screen\_X == 9'd62 && screen\_Y == 8'd211) ||

(screen\_X == 9'd63 && screen\_Y == 8'd211) ||

(screen\_X == 9'd64 && screen\_Y == 8'd211) ||

(screen\_X == 9'd65 && screen\_Y == 8'd211) ||

(screen\_X == 9'd66 && screen\_Y == 8'd211) ||

(screen\_X == 9'd67 && screen\_Y == 8'd211) ||

(screen\_X == 9'd68 && screen\_Y == 8'd211) ||

(screen\_X == 9'd69 && screen\_Y == 8'd211)

) begin // L

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[3:1]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[3:1])) : 3'b111;

end

if ((screen\_X == 9'd71 && screen\_Y == 8'd156) ||

(screen\_X == 9'd72 && screen\_Y == 8'd156) ||

(screen\_X == 9'd73 && screen\_Y == 8'd156) ||

(screen\_X == 9'd74 && screen\_Y == 8'd156) ||

(screen\_X == 9'd75 && screen\_Y == 8'd156) ||

(screen\_X == 9'd76 && screen\_Y == 8'd156) ||

(screen\_X == 9'd77 && screen\_Y == 8'd156) ||

(screen\_X == 9'd78 && screen\_Y == 8'd156) ||

(screen\_X == 9'd79 && screen\_Y == 8'd156) ||

(screen\_X == 9'd80 && screen\_Y == 8'd156) ||

(screen\_X == 9'd81 && screen\_Y == 8'd156) ||

(screen\_X == 9'd82 && screen\_Y == 8'd156) ||

(screen\_X == 9'd83 && screen\_Y == 8'd156) ||

(screen\_X == 9'd84 && screen\_Y == 8'd156) ||

(screen\_X == 9'd85 && screen\_Y == 8'd156) ||

(screen\_X == 9'd86 && screen\_Y == 8'd156) ||

(screen\_X == 9'd87 && screen\_Y == 8'd156) ||

(screen\_X == 9'd88 && screen\_Y == 8'd156) ||

(screen\_X == 9'd89 && screen\_Y == 8'd156) ||

(screen\_X == 9'd90 && screen\_Y == 8'd156) ||

(screen\_X == 9'd91 && screen\_Y == 8'd156) ||

(screen\_X == 9'd92 && screen\_Y == 8'd156) ||

(screen\_X == 9'd93 && screen\_Y == 8'd156) ||

(screen\_X == 9'd94 && screen\_Y == 8'd156) ||

(screen\_X == 9'd95 && screen\_Y == 8'd156) ||

(screen\_X == 9'd96 && screen\_Y == 8'd156) ||

(screen\_X == 9'd97 && screen\_Y == 8'd156) ||

(screen\_X == 9'd98 && screen\_Y == 8'd156) ||

(screen\_X == 9'd99 && screen\_Y == 8'd156) ||

(screen\_X == 9'd100 && screen\_Y == 8'd156) ||

(screen\_X == 9'd101 && screen\_Y == 8'd156) ||

(screen\_X == 9'd102 && screen\_Y == 8'd156) ||

(screen\_X == 9'd103 && screen\_Y == 8'd156) ||

(screen\_X == 9'd104 && screen\_Y == 8'd156) ||

(screen\_X == 9'd105 && screen\_Y == 8'd156) ||

(screen\_X == 9'd106 && screen\_Y == 8'd156) ||

(screen\_X == 9'd107 && screen\_Y == 8'd156) ||

(screen\_X == 9'd75 && screen\_Y == 8'd197) ||

(screen\_X == 9'd76 && screen\_Y == 8'd197) ||

(screen\_X == 9'd77 && screen\_Y == 8'd197) ||

(screen\_X == 9'd78 && screen\_Y == 8'd197) ||

(screen\_X == 9'd79 && screen\_Y == 8'd197) ||

(screen\_X == 9'd80 && screen\_Y == 8'd197) ||

(screen\_X == 9'd81 && screen\_Y == 8'd197) ||

(screen\_X == 9'd82 && screen\_Y == 8'd197) ||

(screen\_X == 9'd83 && screen\_Y == 8'd197) ||

(screen\_X == 9'd84 && screen\_Y == 8'd197) ||

(screen\_X == 9'd85 && screen\_Y == 8'd197) ||

(screen\_X == 9'd86 && screen\_Y == 8'd197) ||

(screen\_X == 9'd87 && screen\_Y == 8'd197) ||

(screen\_X == 9'd88 && screen\_Y == 8'd197) ||

(screen\_X == 9'd89 && screen\_Y == 8'd197) ||

(screen\_X == 9'd90 && screen\_Y == 8'd197) ||

(screen\_X == 9'd91 && screen\_Y == 8'd197) ||

(screen\_X == 9'd92 && screen\_Y == 8'd197) ||

(screen\_X == 9'd93 && screen\_Y == 8'd197) ||

(screen\_X == 9'd94 && screen\_Y == 8'd197) ||

(screen\_X == 9'd95 && screen\_Y == 8'd197) ||

(screen\_X == 9'd96 && screen\_Y == 8'd197) ||

(screen\_X == 9'd97 && screen\_Y == 8'd197) ||

(screen\_X == 9'd98 && screen\_Y == 8'd197) ||

(screen\_X == 9'd99 && screen\_Y == 8'd197) ||

(screen\_X == 9'd100 && screen\_Y == 8'd197) ||

(screen\_X == 9'd101 && screen\_Y == 8'd197) ||

(screen\_X == 9'd102 && screen\_Y == 8'd197) ||

(screen\_X == 9'd103 && screen\_Y == 8'd197) ||

(screen\_X == 9'd104 && screen\_Y == 8'd197) ||

(screen\_X == 9'd105 && screen\_Y == 8'd197) ||

(screen\_X == 9'd106 && screen\_Y == 8'd197) ||

(screen\_X == 9'd107 && screen\_Y == 8'd197) ||

(screen\_X == 9'd75 && screen\_Y == 8'd157) ||

(screen\_X == 9'd75 && screen\_Y == 8'd158) ||

(screen\_X == 9'd75 && screen\_Y == 8'd159) ||

(screen\_X == 9'd75 && screen\_Y == 8'd160) ||

(screen\_X == 9'd75 && screen\_Y == 8'd161) ||

(screen\_X == 9'd75 && screen\_Y == 8'd162) ||

(screen\_X == 9'd75 && screen\_Y == 8'd163) ||

(screen\_X == 9'd75 && screen\_Y == 8'd164) ||

(screen\_X == 9'd75 && screen\_Y == 8'd165) ||

(screen\_X == 9'd75 && screen\_Y == 8'd166) ||

(screen\_X == 9'd75 && screen\_Y == 8'd167) ||

(screen\_X == 9'd75 && screen\_Y == 8'd168) ||

(screen\_X == 9'd75 && screen\_Y == 8'd169) ||

(screen\_X == 9'd75 && screen\_Y == 8'd170) ||

(screen\_X == 9'd75 && screen\_Y == 8'd171) ||

(screen\_X == 9'd75 && screen\_Y == 8'd172) ||

(screen\_X == 9'd75 && screen\_Y == 8'd173) ||

(screen\_X == 9'd75 && screen\_Y == 8'd174) ||

(screen\_X == 9'd75 && screen\_Y == 8'd175) ||

(screen\_X == 9'd75 && screen\_Y == 8'd176) ||

(screen\_X == 9'd75 && screen\_Y == 8'd177) ||

(screen\_X == 9'd75 && screen\_Y == 8'd178) ||

(screen\_X == 9'd75 && screen\_Y == 8'd179) ||

(screen\_X == 9'd75 && screen\_Y == 8'd180) ||

(screen\_X == 9'd75 && screen\_Y == 8'd181) ||

(screen\_X == 9'd75 && screen\_Y == 8'd182) ||

(screen\_X == 9'd75 && screen\_Y == 8'd183) ||

(screen\_X == 9'd75 && screen\_Y == 8'd184) ||

(screen\_X == 9'd75 && screen\_Y == 8'd185) ||

(screen\_X == 9'd75 && screen\_Y == 8'd186) ||

(screen\_X == 9'd75 && screen\_Y == 8'd187) ||

(screen\_X == 9'd75 && screen\_Y == 8'd188) ||

(screen\_X == 9'd75 && screen\_Y == 8'd189) ||

(screen\_X == 9'd75 && screen\_Y == 8'd190) ||

(screen\_X == 9'd75 && screen\_Y == 8'd191) ||

(screen\_X == 9'd75 && screen\_Y == 8'd192) ||

(screen\_X == 9'd75 && screen\_Y == 8'd193) ||

(screen\_X == 9'd75 && screen\_Y == 8'd194) ||

(screen\_X == 9'd75 && screen\_Y == 8'd195) ||

(screen\_X == 9'd75 && screen\_Y == 8'd196) ||

(screen\_X == 9'd107 && screen\_Y == 8'd157) ||

(screen\_X == 9'd107 && screen\_Y == 8'd158) ||

(screen\_X == 9'd107 && screen\_Y == 8'd159) ||

(screen\_X == 9'd107 && screen\_Y == 8'd160) ||

(screen\_X == 9'd107 && screen\_Y == 8'd161) ||

(screen\_X == 9'd107 && screen\_Y == 8'd162) ||

(screen\_X == 9'd107 && screen\_Y == 8'd163) ||

(screen\_X == 9'd107 && screen\_Y == 8'd164) ||

(screen\_X == 9'd107 && screen\_Y == 8'd165) ||

(screen\_X == 9'd107 && screen\_Y == 8'd166) ||

(screen\_X == 9'd107 && screen\_Y == 8'd167) ||

(screen\_X == 9'd107 && screen\_Y == 8'd168) ||

(screen\_X == 9'd107 && screen\_Y == 8'd169) ||

(screen\_X == 9'd107 && screen\_Y == 8'd170) ||

(screen\_X == 9'd107 && screen\_Y == 8'd171) ||

(screen\_X == 9'd107 && screen\_Y == 8'd172) ||

(screen\_X == 9'd107 && screen\_Y == 8'd173) ||

(screen\_X == 9'd107 && screen\_Y == 8'd174) ||

(screen\_X == 9'd107 && screen\_Y == 8'd175) ||

(screen\_X == 9'd107 && screen\_Y == 8'd176) ||

(screen\_X == 9'd107 && screen\_Y == 8'd177) ||

(screen\_X == 9'd107 && screen\_Y == 8'd178) ||

(screen\_X == 9'd107 && screen\_Y == 8'd179) ||

(screen\_X == 9'd107 && screen\_Y == 8'd180) ||

(screen\_X == 9'd107 && screen\_Y == 8'd181) ||

(screen\_X == 9'd107 && screen\_Y == 8'd182) ||

(screen\_X == 9'd107 && screen\_Y == 8'd183) ||

(screen\_X == 9'd107 && screen\_Y == 8'd184) ||

(screen\_X == 9'd107 && screen\_Y == 8'd185) ||

(screen\_X == 9'd107 && screen\_Y == 8'd186) ||

(screen\_X == 9'd107 && screen\_Y == 8'd187) ||

(screen\_X == 9'd107 && screen\_Y == 8'd188) ||

(screen\_X == 9'd107 && screen\_Y == 8'd189) ||

(screen\_X == 9'd107 && screen\_Y == 8'd190) ||

(screen\_X == 9'd107 && screen\_Y == 8'd191) ||

(screen\_X == 9'd107 && screen\_Y == 8'd192) ||

(screen\_X == 9'd107 && screen\_Y == 8'd193) ||

(screen\_X == 9'd107 && screen\_Y == 8'd194) ||

(screen\_X == 9'd107 && screen\_Y == 8'd195) ||

(screen\_X == 9'd107 && screen\_Y == 8'd196)

) begin // O

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[4:2])) : 3'b111;

end

if ((screen\_X == 9'd125 && screen\_Y == 8'd144) ||

(screen\_X == 9'd126 && screen\_Y == 8'd144) ||

(screen\_X == 9'd127 && screen\_Y == 8'd144) ||

(screen\_X == 9'd128 && screen\_Y == 8'd144) ||

(screen\_X == 9'd129 && screen\_Y == 8'd144) ||

(screen\_X == 9'd130 && screen\_Y == 8'd144) ||

(screen\_X == 9'd131 && screen\_Y == 8'd144) ||

(screen\_X == 9'd132 && screen\_Y == 8'd144) ||

(screen\_X == 9'd133 && screen\_Y == 8'd144) ||

(screen\_X == 9'd134 && screen\_Y == 8'd144) ||

(screen\_X == 9'd135 && screen\_Y == 8'd144) ||

(screen\_X == 9'd136 && screen\_Y == 8'd144) ||

(screen\_X == 9'd137 && screen\_Y == 8'd144) ||

(screen\_X == 9'd138 && screen\_Y == 8'd144) ||

(screen\_X == 9'd139 && screen\_Y == 8'd144) ||

(screen\_X == 9'd140 && screen\_Y == 8'd144) ||

(screen\_X == 9'd141 && screen\_Y == 8'd144) ||

(screen\_X == 9'd142 && screen\_Y == 8'd144) ||

(screen\_X == 9'd143 && screen\_Y == 8'd144) ||

(screen\_X == 9'd144 && screen\_Y == 8'd144) ||

(screen\_X == 9'd145 && screen\_Y == 8'd144) ||

(screen\_X == 9'd146 && screen\_Y == 8'd144) ||

(screen\_X == 9'd147 && screen\_Y == 8'd144) ||

(screen\_X == 9'd148 && screen\_Y == 8'd144) ||

(screen\_X == 9'd149 && screen\_Y == 8'd144) ||

(screen\_X == 9'd150 && screen\_Y == 8'd144) ||

(screen\_X == 9'd151 && screen\_Y == 8'd144) ||

(screen\_X == 9'd152 && screen\_Y == 8'd144) ||

(screen\_X == 9'd153 && screen\_Y == 8'd144) ||

(screen\_X == 9'd154 && screen\_Y == 8'd144) ||

(screen\_X == 9'd155 && screen\_Y == 8'd144) ||

(screen\_X == 9'd156 && screen\_Y == 8'd144) ||

(screen\_X == 9'd157 && screen\_Y == 8'd144) ||

(screen\_X == 9'd158 && screen\_Y == 8'd144) ||

(screen\_X == 9'd126 && screen\_Y == 8'd179) ||

(screen\_X == 9'd127 && screen\_Y == 8'd179) ||

(screen\_X == 9'd128 && screen\_Y == 8'd179) ||

(screen\_X == 9'd129 && screen\_Y == 8'd179) ||

(screen\_X == 9'd130 && screen\_Y == 8'd179) ||

(screen\_X == 9'd131 && screen\_Y == 8'd179) ||

(screen\_X == 9'd132 && screen\_Y == 8'd179) ||

(screen\_X == 9'd133 && screen\_Y == 8'd179) ||

(screen\_X == 9'd134 && screen\_Y == 8'd179) ||

(screen\_X == 9'd135 && screen\_Y == 8'd179) ||

(screen\_X == 9'd136 && screen\_Y == 8'd179) ||

(screen\_X == 9'd137 && screen\_Y == 8'd179) ||

(screen\_X == 9'd138 && screen\_Y == 8'd179) ||

(screen\_X == 9'd139 && screen\_Y == 8'd179) ||

(screen\_X == 9'd140 && screen\_Y == 8'd179) ||

(screen\_X == 9'd141 && screen\_Y == 8'd179) ||

(screen\_X == 9'd142 && screen\_Y == 8'd179) ||

(screen\_X == 9'd143 && screen\_Y == 8'd179) ||

(screen\_X == 9'd144 && screen\_Y == 8'd179) ||

(screen\_X == 9'd145 && screen\_Y == 8'd179) ||

(screen\_X == 9'd146 && screen\_Y == 8'd179) ||

(screen\_X == 9'd147 && screen\_Y == 8'd179) ||

(screen\_X == 9'd148 && screen\_Y == 8'd179) ||

(screen\_X == 9'd149 && screen\_Y == 8'd179) ||

(screen\_X == 9'd150 && screen\_Y == 8'd179) ||

(screen\_X == 9'd151 && screen\_Y == 8'd179) ||

(screen\_X == 9'd152 && screen\_Y == 8'd179) ||

(screen\_X == 9'd153 && screen\_Y == 8'd179) ||

(screen\_X == 9'd154 && screen\_Y == 8'd179) ||

(screen\_X == 9'd155 && screen\_Y == 8'd179) ||

(screen\_X == 9'd156 && screen\_Y == 8'd179) ||

(screen\_X == 9'd157 && screen\_Y == 8'd179) ||

(screen\_X == 9'd108 && screen\_Y == 8'd212) ||

(screen\_X == 9'd109 && screen\_Y == 8'd212) ||

(screen\_X == 9'd110 && screen\_Y == 8'd212) ||

(screen\_X == 9'd111 && screen\_Y == 8'd212) ||

(screen\_X == 9'd112 && screen\_Y == 8'd212) ||

(screen\_X == 9'd113 && screen\_Y == 8'd212) ||

(screen\_X == 9'd114 && screen\_Y == 8'd212) ||

(screen\_X == 9'd115 && screen\_Y == 8'd212) ||

(screen\_X == 9'd116 && screen\_Y == 8'd212) ||

(screen\_X == 9'd117 && screen\_Y == 8'd212) ||

(screen\_X == 9'd118 && screen\_Y == 8'd212) ||

(screen\_X == 9'd119 && screen\_Y == 8'd212) ||

(screen\_X == 9'd120 && screen\_Y == 8'd212) ||

(screen\_X == 9'd121 && screen\_Y == 8'd212) ||

(screen\_X == 9'd122 && screen\_Y == 8'd212) ||

(screen\_X == 9'd123 && screen\_Y == 8'd212) ||

(screen\_X == 9'd124 && screen\_Y == 8'd212) ||

(screen\_X == 9'd125 && screen\_Y == 8'd212) ||

(screen\_X == 9'd126 && screen\_Y == 8'd212) ||

(screen\_X == 9'd127 && screen\_Y == 8'd212) ||

(screen\_X == 9'd128 && screen\_Y == 8'd212) ||

(screen\_X == 9'd129 && screen\_Y == 8'd212) ||

(screen\_X == 9'd130 && screen\_Y == 8'd212) ||

(screen\_X == 9'd131 && screen\_Y == 8'd212) ||

(screen\_X == 9'd132 && screen\_Y == 8'd212) ||

(screen\_X == 9'd133 && screen\_Y == 8'd212) ||

(screen\_X == 9'd134 && screen\_Y == 8'd212) ||

(screen\_X == 9'd135 && screen\_Y == 8'd212) ||

(screen\_X == 9'd136 && screen\_Y == 8'd212) ||

(screen\_X == 9'd137 && screen\_Y == 8'd212) ||

(screen\_X == 9'd138 && screen\_Y == 8'd212) ||

(screen\_X == 9'd139 && screen\_Y == 8'd212) ||

(screen\_X == 9'd140 && screen\_Y == 8'd212) ||

(screen\_X == 9'd141 && screen\_Y == 8'd212) ||

(screen\_X == 9'd142 && screen\_Y == 8'd212) ||

(screen\_X == 9'd143 && screen\_Y == 8'd212) ||

(screen\_X == 9'd144 && screen\_Y == 8'd212) ||

(screen\_X == 9'd145 && screen\_Y == 8'd212) ||

(screen\_X == 9'd146 && screen\_Y == 8'd212) ||

(screen\_X == 9'd147 && screen\_Y == 8'd212) ||

(screen\_X == 9'd148 && screen\_Y == 8'd212) ||

(screen\_X == 9'd149 && screen\_Y == 8'd212) ||

(screen\_X == 9'd150 && screen\_Y == 8'd212) ||

(screen\_X == 9'd151 && screen\_Y == 8'd212) ||

(screen\_X == 9'd152 && screen\_Y == 8'd212) ||

(screen\_X == 9'd153 && screen\_Y == 8'd212) ||

(screen\_X == 9'd154 && screen\_Y == 8'd212) ||

(screen\_X == 9'd155 && screen\_Y == 8'd212) ||

(screen\_X == 9'd156 && screen\_Y == 8'd212) ||

(screen\_X == 9'd125 && screen\_Y == 8'd145) ||

(screen\_X == 9'd125 && screen\_Y == 8'd146) ||

(screen\_X == 9'd125 && screen\_Y == 8'd147) ||

(screen\_X == 9'd125 && screen\_Y == 8'd148) ||

(screen\_X == 9'd125 && screen\_Y == 8'd149) ||

(screen\_X == 9'd125 && screen\_Y == 8'd150) ||

(screen\_X == 9'd125 && screen\_Y == 8'd151) ||

(screen\_X == 9'd125 && screen\_Y == 8'd152) ||

(screen\_X == 9'd125 && screen\_Y == 8'd153) ||

(screen\_X == 9'd125 && screen\_Y == 8'd154) ||

(screen\_X == 9'd125 && screen\_Y == 8'd155) ||

(screen\_X == 9'd125 && screen\_Y == 8'd156) ||

(screen\_X == 9'd125 && screen\_Y == 8'd157) ||

(screen\_X == 9'd125 && screen\_Y == 8'd158) ||

(screen\_X == 9'd125 && screen\_Y == 8'd159) ||

(screen\_X == 9'd125 && screen\_Y == 8'd160) ||

(screen\_X == 9'd125 && screen\_Y == 8'd161) ||

(screen\_X == 9'd125 && screen\_Y == 8'd162) ||

(screen\_X == 9'd125 && screen\_Y == 8'd163) ||

(screen\_X == 9'd125 && screen\_Y == 8'd164) ||

(screen\_X == 9'd125 && screen\_Y == 8'd165) ||

(screen\_X == 9'd125 && screen\_Y == 8'd166) ||

(screen\_X == 9'd125 && screen\_Y == 8'd167) ||

(screen\_X == 9'd125 && screen\_Y == 8'd168) ||

(screen\_X == 9'd125 && screen\_Y == 8'd169) ||

(screen\_X == 9'd125 && screen\_Y == 8'd170) ||

(screen\_X == 9'd125 && screen\_Y == 8'd171) ||

(screen\_X == 9'd125 && screen\_Y == 8'd172) ||

(screen\_X == 9'd125 && screen\_Y == 8'd173) ||

(screen\_X == 9'd125 && screen\_Y == 8'd174) ||

(screen\_X == 9'd125 && screen\_Y == 8'd175) ||

(screen\_X == 9'd125 && screen\_Y == 8'd176) ||

(screen\_X == 9'd125 && screen\_Y == 8'd177) ||

(screen\_X == 9'd125 && screen\_Y == 8'd178) ||

(screen\_X == 9'd125 && screen\_Y == 8'd179) ||

(screen\_X == 9'd157 && screen\_Y == 8'd180) ||

(screen\_X == 9'd157 && screen\_Y == 8'd181) ||

(screen\_X == 9'd157 && screen\_Y == 8'd182) ||

(screen\_X == 9'd157 && screen\_Y == 8'd183) ||

(screen\_X == 9'd157 && screen\_Y == 8'd184) ||

(screen\_X == 9'd157 && screen\_Y == 8'd185) ||

(screen\_X == 9'd157 && screen\_Y == 8'd186) ||

(screen\_X == 9'd157 && screen\_Y == 8'd187) ||

(screen\_X == 9'd157 && screen\_Y == 8'd188) ||

(screen\_X == 9'd157 && screen\_Y == 8'd189) ||

(screen\_X == 9'd157 && screen\_Y == 8'd190) ||

(screen\_X == 9'd157 && screen\_Y == 8'd191) ||

(screen\_X == 9'd157 && screen\_Y == 8'd192) ||

(screen\_X == 9'd157 && screen\_Y == 8'd193) ||

(screen\_X == 9'd157 && screen\_Y == 8'd194) ||

(screen\_X == 9'd157 && screen\_Y == 8'd195) ||

(screen\_X == 9'd157 && screen\_Y == 8'd196) ||

(screen\_X == 9'd157 && screen\_Y == 8'd197) ||

(screen\_X == 9'd157 && screen\_Y == 8'd198) ||

(screen\_X == 9'd157 && screen\_Y == 8'd199) ||

(screen\_X == 9'd157 && screen\_Y == 8'd200) ||

(screen\_X == 9'd157 && screen\_Y == 8'd201) ||

(screen\_X == 9'd157 && screen\_Y == 8'd202) ||

(screen\_X == 9'd157 && screen\_Y == 8'd203) ||

(screen\_X == 9'd157 && screen\_Y == 8'd204) ||

(screen\_X == 9'd157 && screen\_Y == 8'd205) ||

(screen\_X == 9'd157 && screen\_Y == 8'd206) ||

(screen\_X == 9'd157 && screen\_Y == 8'd207) ||

(screen\_X == 9'd157 && screen\_Y == 8'd208) ||

(screen\_X == 9'd157 && screen\_Y == 8'd209) ||

(screen\_X == 9'd157 && screen\_Y == 8'd210) ||

(screen\_X == 9'd157 && screen\_Y == 8'd211) ||

(screen\_X == 9'd157 && screen\_Y == 8'd212)

) begin // S

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[5:3]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[5:3])) : 3'b111;

end

if ((screen\_X == 9'd175 && screen\_Y == 8'd136) ||

(screen\_X == 9'd175 && screen\_Y == 8'd137) ||

(screen\_X == 9'd175 && screen\_Y == 8'd138) ||

(screen\_X == 9'd175 && screen\_Y == 8'd139) ||

(screen\_X == 9'd175 && screen\_Y == 8'd140) ||

(screen\_X == 9'd175 && screen\_Y == 8'd141) ||

(screen\_X == 9'd175 && screen\_Y == 8'd142) ||

(screen\_X == 9'd175 && screen\_Y == 8'd143) ||

(screen\_X == 9'd175 && screen\_Y == 8'd144) ||

(screen\_X == 9'd175 && screen\_Y == 8'd145) ||

(screen\_X == 9'd175 && screen\_Y == 8'd146) ||

(screen\_X == 9'd175 && screen\_Y == 8'd147) ||

(screen\_X == 9'd175 && screen\_Y == 8'd148) ||

(screen\_X == 9'd175 && screen\_Y == 8'd149) ||

(screen\_X == 9'd175 && screen\_Y == 8'd150) ||

(screen\_X == 9'd175 && screen\_Y == 8'd151) ||

(screen\_X == 9'd175 && screen\_Y == 8'd152) ||

(screen\_X == 9'd175 && screen\_Y == 8'd153) ||

(screen\_X == 9'd175 && screen\_Y == 8'd154) ||

(screen\_X == 9'd175 && screen\_Y == 8'd155) ||

(screen\_X == 9'd175 && screen\_Y == 8'd156) ||

(screen\_X == 9'd175 && screen\_Y == 8'd157) ||

(screen\_X == 9'd175 && screen\_Y == 8'd158) ||

(screen\_X == 9'd175 && screen\_Y == 8'd159) ||

(screen\_X == 9'd175 && screen\_Y == 8'd160) ||

(screen\_X == 9'd175 && screen\_Y == 8'd161) ||

(screen\_X == 9'd175 && screen\_Y == 8'd162) ||

(screen\_X == 9'd175 && screen\_Y == 8'd163) ||

(screen\_X == 9'd175 && screen\_Y == 8'd164) ||

(screen\_X == 9'd175 && screen\_Y == 8'd165) ||

(screen\_X == 9'd175 && screen\_Y == 8'd166) ||

(screen\_X == 9'd175 && screen\_Y == 8'd167) ||

(screen\_X == 9'd175 && screen\_Y == 8'd168) ||

(screen\_X == 9'd175 && screen\_Y == 8'd169) ||

(screen\_X == 9'd175 && screen\_Y == 8'd170) ||

(screen\_X == 9'd175 && screen\_Y == 8'd171) ||

(screen\_X == 9'd175 && screen\_Y == 8'd172) ||

(screen\_X == 9'd175 && screen\_Y == 8'd173) ||

(screen\_X == 9'd175 && screen\_Y == 8'd174) ||

(screen\_X == 9'd175 && screen\_Y == 8'd175) ||

(screen\_X == 9'd175 && screen\_Y == 8'd176) ||

(screen\_X == 9'd175 && screen\_Y == 8'd177) ||

(screen\_X == 9'd175 && screen\_Y == 8'd178) ||

(screen\_X == 9'd175 && screen\_Y == 8'd179) ||

(screen\_X == 9'd175 && screen\_Y == 8'd180) ||

(screen\_X == 9'd175 && screen\_Y == 8'd181) ||

(screen\_X == 9'd175 && screen\_Y == 8'd182) ||

(screen\_X == 9'd175 && screen\_Y == 8'd183) ||

(screen\_X == 9'd175 && screen\_Y == 8'd184) ||

(screen\_X == 9'd175 && screen\_Y == 8'd185) ||

(screen\_X == 9'd175 && screen\_Y == 8'd186) ||

(screen\_X == 9'd175 && screen\_Y == 8'd187) ||

(screen\_X == 9'd175 && screen\_Y == 8'd188) ||

(screen\_X == 9'd175 && screen\_Y == 8'd189) ||

(screen\_X == 9'd175 && screen\_Y == 8'd190) ||

(screen\_X == 9'd175 && screen\_Y == 8'd191) ||

(screen\_X == 9'd175 && screen\_Y == 8'd192) ||

(screen\_X == 9'd175 && screen\_Y == 8'd193) ||

(screen\_X == 9'd175 && screen\_Y == 8'd194) ||

(screen\_X == 9'd175 && screen\_Y == 8'd195) ||

(screen\_X == 9'd175 && screen\_Y == 8'd196) ||

(screen\_X == 9'd175 && screen\_Y == 8'd197) ||

(screen\_X == 9'd175 && screen\_Y == 8'd198) ||

(screen\_X == 9'd175 && screen\_Y == 8'd199) ||

(screen\_X == 9'd175 && screen\_Y == 8'd200) ||

(screen\_X == 9'd175 && screen\_Y == 8'd201) ||

(screen\_X == 9'd176 && screen\_Y == 8'd170) ||

(screen\_X == 9'd177 && screen\_Y == 8'd170) ||

(screen\_X == 9'd178 && screen\_Y == 8'd170) ||

(screen\_X == 9'd179 && screen\_Y == 8'd170) ||

(screen\_X == 9'd180 && screen\_Y == 8'd170) ||

(screen\_X == 9'd181 && screen\_Y == 8'd170) ||

(screen\_X == 9'd182 && screen\_Y == 8'd170) ||

(screen\_X == 9'd183 && screen\_Y == 8'd170) ||

(screen\_X == 9'd184 && screen\_Y == 8'd170) ||

(screen\_X == 9'd185 && screen\_Y == 8'd170) ||

(screen\_X == 9'd186 && screen\_Y == 8'd170) ||

(screen\_X == 9'd187 && screen\_Y == 8'd170) ||

(screen\_X == 9'd188 && screen\_Y == 8'd170) ||

(screen\_X == 9'd189 && screen\_Y == 8'd170) ||

(screen\_X == 9'd190 && screen\_Y == 8'd170) ||

(screen\_X == 9'd191 && screen\_Y == 8'd170) ||

(screen\_X == 9'd192 && screen\_Y == 8'd170) ||

(screen\_X == 9'd193 && screen\_Y == 8'd170) ||

(screen\_X == 9'd194 && screen\_Y == 8'd170) ||

(screen\_X == 9'd195 && screen\_Y == 8'd170) ||

(screen\_X == 9'd196 && screen\_Y == 8'd170) ||

(screen\_X == 9'd176 && screen\_Y == 8'd137) ||

(screen\_X == 9'd177 && screen\_Y == 8'd137) ||

(screen\_X == 9'd178 && screen\_Y == 8'd137) ||

(screen\_X == 9'd179 && screen\_Y == 8'd137) ||

(screen\_X == 9'd180 && screen\_Y == 8'd137) ||

(screen\_X == 9'd181 && screen\_Y == 8'd137) ||

(screen\_X == 9'd182 && screen\_Y == 8'd137) ||

(screen\_X == 9'd183 && screen\_Y == 8'd137) ||

(screen\_X == 9'd184 && screen\_Y == 8'd137) ||

(screen\_X == 9'd185 && screen\_Y == 8'd137) ||

(screen\_X == 9'd186 && screen\_Y == 8'd137) ||

(screen\_X == 9'd187 && screen\_Y == 8'd137) ||

(screen\_X == 9'd188 && screen\_Y == 8'd137) ||

(screen\_X == 9'd189 && screen\_Y == 8'd137) ||

(screen\_X == 9'd190 && screen\_Y == 8'd137) ||

(screen\_X == 9'd191 && screen\_Y == 8'd137) ||

(screen\_X == 9'd192 && screen\_Y == 8'd137) ||

(screen\_X == 9'd193 && screen\_Y == 8'd137) ||

(screen\_X == 9'd194 && screen\_Y == 8'd137) ||

(screen\_X == 9'd195 && screen\_Y == 8'd137) ||

(screen\_X == 9'd196 && screen\_Y == 8'd137) ||

(screen\_X == 9'd197 && screen\_Y == 8'd137) ||

(screen\_X == 9'd198 && screen\_Y == 8'd137) ||

(screen\_X == 9'd199 && screen\_Y == 8'd137) ||

(screen\_X == 9'd200 && screen\_Y == 8'd137) ||

(screen\_X == 9'd201 && screen\_Y == 8'd137) ||

(screen\_X == 9'd202 && screen\_Y == 8'd137) ||

(screen\_X == 9'd203 && screen\_Y == 8'd137) ||

(screen\_X == 9'd204 && screen\_Y == 8'd137) ||

(screen\_X == 9'd205 && screen\_Y == 8'd137) ||

(screen\_X == 9'd206 && screen\_Y == 8'd137) ||

(screen\_X == 9'd207 && screen\_Y == 8'd137) ||

(screen\_X == 9'd208 && screen\_Y == 8'd137) ||

(screen\_X == 9'd209 && screen\_Y == 8'd137) ||

(screen\_X == 9'd210 && screen\_Y == 8'd137) ||

(screen\_X == 9'd211 && screen\_Y == 8'd137) ||

(screen\_X == 9'd212 && screen\_Y == 8'd137) ||

(screen\_X == 9'd213 && screen\_Y == 8'd137) ||

(screen\_X == 9'd214 && screen\_Y == 8'd137) ||

(screen\_X == 9'd176 && screen\_Y == 8'd201) ||

(screen\_X == 9'd177 && screen\_Y == 8'd201) ||

(screen\_X == 9'd178 && screen\_Y == 8'd201) ||

(screen\_X == 9'd179 && screen\_Y == 8'd201) ||

(screen\_X == 9'd180 && screen\_Y == 8'd201) ||

(screen\_X == 9'd181 && screen\_Y == 8'd201) ||

(screen\_X == 9'd182 && screen\_Y == 8'd201) ||

(screen\_X == 9'd183 && screen\_Y == 8'd201) ||

(screen\_X == 9'd184 && screen\_Y == 8'd201) ||

(screen\_X == 9'd185 && screen\_Y == 8'd201) ||

(screen\_X == 9'd186 && screen\_Y == 8'd201) ||

(screen\_X == 9'd187 && screen\_Y == 8'd201) ||

(screen\_X == 9'd188 && screen\_Y == 8'd201) ||

(screen\_X == 9'd189 && screen\_Y == 8'd201) ||

(screen\_X == 9'd190 && screen\_Y == 8'd201) ||

(screen\_X == 9'd191 && screen\_Y == 8'd201) ||

(screen\_X == 9'd192 && screen\_Y == 8'd201) ||

(screen\_X == 9'd193 && screen\_Y == 8'd201) ||

(screen\_X == 9'd194 && screen\_Y == 8'd201) ||

(screen\_X == 9'd195 && screen\_Y == 8'd201) ||

(screen\_X == 9'd196 && screen\_Y == 8'd201) ||

(screen\_X == 9'd197 && screen\_Y == 8'd201) ||

(screen\_X == 9'd198 && screen\_Y == 8'd201) ||

(screen\_X == 9'd199 && screen\_Y == 8'd201) ||

(screen\_X == 9'd200 && screen\_Y == 8'd201) ||

(screen\_X == 9'd201 && screen\_Y == 8'd201) ||

(screen\_X == 9'd202 && screen\_Y == 8'd201) ||

(screen\_X == 9'd203 && screen\_Y == 8'd201) ||

(screen\_X == 9'd204 && screen\_Y == 8'd201) ||

(screen\_X == 9'd205 && screen\_Y == 8'd201) ||

(screen\_X == 9'd206 && screen\_Y == 8'd201) ||

(screen\_X == 9'd207 && screen\_Y == 8'd201) ||

(screen\_X == 9'd208 && screen\_Y == 8'd201) ||

(screen\_X == 9'd209 && screen\_Y == 8'd201) ||

(screen\_X == 9'd210 && screen\_Y == 8'd201) ||

(screen\_X == 9'd211 && screen\_Y == 8'd201) ||

(screen\_X == 9'd212 && screen\_Y == 8'd201) ||

(screen\_X == 9'd213 && screen\_Y == 8'd201) ||

(screen\_X == 9'd214 && screen\_Y == 8'd201)

) begin // E

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[7:5]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[7:5])) : 3'b111;

end

if ((screen\_X == 9'd238 && screen\_Y == 8'd130) ||

(screen\_X == 9'd238 && screen\_Y == 8'd131) ||

(screen\_X == 9'd238 && screen\_Y == 8'd132) ||

(screen\_X == 9'd238 && screen\_Y == 8'd133) ||

(screen\_X == 9'd238 && screen\_Y == 8'd134) ||

(screen\_X == 9'd238 && screen\_Y == 8'd135) ||

(screen\_X == 9'd238 && screen\_Y == 8'd136) ||

(screen\_X == 9'd238 && screen\_Y == 8'd137) ||

(screen\_X == 9'd238 && screen\_Y == 8'd138) ||

(screen\_X == 9'd238 && screen\_Y == 8'd139) ||

(screen\_X == 9'd238 && screen\_Y == 8'd140) ||

(screen\_X == 9'd238 && screen\_Y == 8'd141) ||

(screen\_X == 9'd238 && screen\_Y == 8'd142) ||

(screen\_X == 9'd238 && screen\_Y == 8'd143) ||

(screen\_X == 9'd238 && screen\_Y == 8'd144) ||

(screen\_X == 9'd238 && screen\_Y == 8'd145) ||

(screen\_X == 9'd238 && screen\_Y == 8'd146) ||

(screen\_X == 9'd238 && screen\_Y == 8'd147) ||

(screen\_X == 9'd238 && screen\_Y == 8'd148) ||

(screen\_X == 9'd238 && screen\_Y == 8'd149) ||

(screen\_X == 9'd238 && screen\_Y == 8'd150) ||

(screen\_X == 9'd238 && screen\_Y == 8'd151) ||

(screen\_X == 9'd238 && screen\_Y == 8'd152) ||

(screen\_X == 9'd238 && screen\_Y == 8'd153) ||

(screen\_X == 9'd238 && screen\_Y == 8'd154) ||

(screen\_X == 9'd238 && screen\_Y == 8'd155) ||

(screen\_X == 9'd238 && screen\_Y == 8'd156) ||

(screen\_X == 9'd238 && screen\_Y == 8'd157) ||

(screen\_X == 9'd238 && screen\_Y == 8'd158) ||

(screen\_X == 9'd238 && screen\_Y == 8'd159) ||

(screen\_X == 9'd238 && screen\_Y == 8'd160) ||

(screen\_X == 9'd238 && screen\_Y == 8'd161) ||

(screen\_X == 9'd238 && screen\_Y == 8'd162) ||

(screen\_X == 9'd238 && screen\_Y == 8'd163) ||

(screen\_X == 9'd238 && screen\_Y == 8'd164) ||

(screen\_X == 9'd238 && screen\_Y == 8'd165) ||

(screen\_X == 9'd238 && screen\_Y == 8'd166) ||

(screen\_X == 9'd238 && screen\_Y == 8'd167) ||

(screen\_X == 9'd238 && screen\_Y == 8'd168) ||

(screen\_X == 9'd238 && screen\_Y == 8'd169) ||

(screen\_X == 9'd238 && screen\_Y == 8'd170) ||

(screen\_X == 9'd238 && screen\_Y == 8'd171) ||

(screen\_X == 9'd238 && screen\_Y == 8'd172) ||

(screen\_X == 9'd238 && screen\_Y == 8'd173) ||

(screen\_X == 9'd238 && screen\_Y == 8'd174) ||

(screen\_X == 9'd238 && screen\_Y == 8'd175) ||

(screen\_X == 9'd238 && screen\_Y == 8'd176) ||

(screen\_X == 9'd238 && screen\_Y == 8'd177) ||

(screen\_X == 9'd238 && screen\_Y == 8'd178) ||

(screen\_X == 9'd238 && screen\_Y == 8'd179) ||

(screen\_X == 9'd238 && screen\_Y == 8'd180) ||

(screen\_X == 9'd238 && screen\_Y == 8'd181) ||

(screen\_X == 9'd238 && screen\_Y == 8'd182) ||

(screen\_X == 9'd238 && screen\_Y == 8'd183) ||

(screen\_X == 9'd238 && screen\_Y == 8'd184) ||

(screen\_X == 9'd238 && screen\_Y == 8'd185) ||

(screen\_X == 9'd238 && screen\_Y == 8'd186) ||

(screen\_X == 9'd238 && screen\_Y == 8'd187) ||

(screen\_X == 9'd238 && screen\_Y == 8'd188) ||

(screen\_X == 9'd238 && screen\_Y == 8'd189) ||

(screen\_X == 9'd238 && screen\_Y == 8'd190) ||

(screen\_X == 9'd238 && screen\_Y == 8'd191) ||

(screen\_X == 9'd238 && screen\_Y == 8'd192) ||

(screen\_X == 9'd238 && screen\_Y == 8'd193) ||

(screen\_X == 9'd238 && screen\_Y == 8'd194) ||

(screen\_X == 9'd238 && screen\_Y == 8'd195) ||

(screen\_X == 9'd238 && screen\_Y == 8'd196) ||

(screen\_X == 9'd238 && screen\_Y == 8'd197) ||

(screen\_X == 9'd238 && screen\_Y == 8'd198) ||

(screen\_X == 9'd238 && screen\_Y == 8'd199) ||

(screen\_X == 9'd238 && screen\_Y == 8'd200) ||

(screen\_X == 9'd238 && screen\_Y == 8'd201) ||

(screen\_X == 9'd238 && screen\_Y == 8'd206) ||

(screen\_X == 9'd238 && screen\_Y == 8'd207)

) begin // !

pixel\_colour = colourful ? (((randNum\_12b[9:7] ^ randNum\_12b[2:0]) == 3'b0) ? 3'b111 : (randNum\_12b[9:7] ^ randNum\_12b[2:0])) : 3'b111;

end

if ((screen\_X == 9'd257 && screen\_Y == 8'd128) ||

(screen\_X == 9'd257 && screen\_Y == 8'd129) ||

(screen\_X == 9'd257 && screen\_Y == 8'd130) ||

(screen\_X == 9'd257 && screen\_Y == 8'd131) ||

(screen\_X == 9'd257 && screen\_Y == 8'd132) ||

(screen\_X == 9'd257 && screen\_Y == 8'd133) ||

(screen\_X == 9'd257 && screen\_Y == 8'd134) ||

(screen\_X == 9'd257 && screen\_Y == 8'd135) ||

(screen\_X == 9'd257 && screen\_Y == 8'd136) ||

(screen\_X == 9'd257 && screen\_Y == 8'd137) ||

(screen\_X == 9'd257 && screen\_Y == 8'd138) ||

(screen\_X == 9'd257 && screen\_Y == 8'd139) ||

(screen\_X == 9'd257 && screen\_Y == 8'd140) ||

(screen\_X == 9'd257 && screen\_Y == 8'd141) ||

(screen\_X == 9'd257 && screen\_Y == 8'd142) ||

(screen\_X == 9'd257 && screen\_Y == 8'd143) ||

(screen\_X == 9'd257 && screen\_Y == 8'd144) ||

(screen\_X == 9'd257 && screen\_Y == 8'd145) ||

(screen\_X == 9'd257 && screen\_Y == 8'd146) ||

(screen\_X == 9'd257 && screen\_Y == 8'd147) ||

(screen\_X == 9'd257 && screen\_Y == 8'd148) ||

(screen\_X == 9'd257 && screen\_Y == 8'd149) ||

(screen\_X == 9'd257 && screen\_Y == 8'd150) ||

(screen\_X == 9'd257 && screen\_Y == 8'd151) ||

(screen\_X == 9'd257 && screen\_Y == 8'd152) ||

(screen\_X == 9'd257 && screen\_Y == 8'd153) ||

(screen\_X == 9'd257 && screen\_Y == 8'd154) ||

(screen\_X == 9'd257 && screen\_Y == 8'd155) ||

(screen\_X == 9'd257 && screen\_Y == 8'd156) ||

(screen\_X == 9'd257 && screen\_Y == 8'd157) ||

(screen\_X == 9'd257 && screen\_Y == 8'd158) ||

(screen\_X == 9'd257 && screen\_Y == 8'd159) ||

(screen\_X == 9'd257 && screen\_Y == 8'd160) ||

(screen\_X == 9'd257 && screen\_Y == 8'd161) ||

(screen\_X == 9'd257 && screen\_Y == 8'd162) ||

(screen\_X == 9'd257 && screen\_Y == 8'd163) ||

(screen\_X == 9'd257 && screen\_Y == 8'd164) ||

(screen\_X == 9'd257 && screen\_Y == 8'd165) ||

(screen\_X == 9'd257 && screen\_Y == 8'd166) ||

(screen\_X == 9'd257 && screen\_Y == 8'd167) ||

(screen\_X == 9'd257 && screen\_Y == 8'd168) ||

(screen\_X == 9'd257 && screen\_Y == 8'd169) ||

(screen\_X == 9'd257 && screen\_Y == 8'd170) ||

(screen\_X == 9'd257 && screen\_Y == 8'd171) ||

(screen\_X == 9'd257 && screen\_Y == 8'd172) ||

(screen\_X == 9'd257 && screen\_Y == 8'd173) ||

(screen\_X == 9'd257 && screen\_Y == 8'd174) ||

(screen\_X == 9'd257 && screen\_Y == 8'd175) ||

(screen\_X == 9'd257 && screen\_Y == 8'd176) ||

(screen\_X == 9'd257 && screen\_Y == 8'd177) ||

(screen\_X == 9'd257 && screen\_Y == 8'd178) ||

(screen\_X == 9'd257 && screen\_Y == 8'd179) ||

(screen\_X == 9'd257 && screen\_Y == 8'd180) ||

(screen\_X == 9'd257 && screen\_Y == 8'd181) ||

(screen\_X == 9'd257 && screen\_Y == 8'd182) ||

(screen\_X == 9'd257 && screen\_Y == 8'd183) ||

(screen\_X == 9'd257 && screen\_Y == 8'd184) ||

(screen\_X == 9'd257 && screen\_Y == 8'd185) ||

(screen\_X == 9'd257 && screen\_Y == 8'd186) ||

(screen\_X == 9'd257 && screen\_Y == 8'd187) ||

(screen\_X == 9'd257 && screen\_Y == 8'd188) ||

(screen\_X == 9'd257 && screen\_Y == 8'd189) ||

(screen\_X == 9'd257 && screen\_Y == 8'd190) ||

(screen\_X == 9'd257 && screen\_Y == 8'd191) ||

(screen\_X == 9'd257 && screen\_Y == 8'd192) ||

(screen\_X == 9'd257 && screen\_Y == 8'd193) ||

(screen\_X == 9'd257 && screen\_Y == 8'd194) ||

(screen\_X == 9'd257 && screen\_Y == 8'd195) ||

(screen\_X == 9'd257 && screen\_Y == 8'd196) ||

(screen\_X == 9'd257 && screen\_Y == 8'd197) ||

(screen\_X == 9'd257 && screen\_Y == 8'd198) ||

(screen\_X == 9'd257 && screen\_Y == 8'd199) ||

(screen\_X == 9'd257 && screen\_Y == 8'd200) ||

(screen\_X == 9'd257 && screen\_Y == 8'd201) ||

(screen\_X == 9'd257 && screen\_Y == 8'd205) ||

(screen\_X == 9'd257 && screen\_Y == 8'd206) ||

(screen\_X == 9'd257 && screen\_Y == 8'd207)

) begin // !

pixel\_colour = colourful ? (((randNum\_12b[9:7] ^ randNum\_12b[3:1]) == 3'b0) ? 3'b111 : (randNum\_12b[9:7] ^ randNum\_12b[3:1])) : 3'b111;

end

if ((screen\_X == 9'd27 && screen\_Y == 8'd224) ||

(screen\_X == 9'd27 && screen\_Y == 8'd225) ||

(screen\_X == 9'd27 && screen\_Y == 8'd226) ||

(screen\_X == 9'd27 && screen\_Y == 8'd227) ||

(screen\_X == 9'd27 && screen\_Y == 8'd228) ||

(screen\_X == 9'd27 && screen\_Y == 8'd229) ||

(screen\_X == 9'd27 && screen\_Y == 8'd230) ||

(screen\_X == 9'd27 && screen\_Y == 8'd231) ||

(screen\_X == 9'd27 && screen\_Y == 8'd232) ||

(screen\_X == 9'd27 && screen\_Y == 8'd233) ||

(screen\_X == 9'd27 && screen\_Y == 8'd234) ||

(screen\_X == 9'd27 && screen\_Y == 8'd235) ||

(screen\_X == 9'd32 && screen\_Y == 8'd224) ||

(screen\_X == 9'd32 && screen\_Y == 8'd225) ||

(screen\_X == 9'd32 && screen\_Y == 8'd226) ||

(screen\_X == 9'd32 && screen\_Y == 8'd227) ||

(screen\_X == 9'd32 && screen\_Y == 8'd228) ||

(screen\_X == 9'd28 && screen\_Y == 8'd224) ||

(screen\_X == 9'd29 && screen\_Y == 8'd224) ||

(screen\_X == 9'd30 && screen\_Y == 8'd224) ||

(screen\_X == 9'd31 && screen\_Y == 8'd224) ||

(screen\_X == 9'd28 && screen\_Y == 8'd228) ||

(screen\_X == 9'd29 && screen\_Y == 8'd228) ||

(screen\_X == 9'd30 && screen\_Y == 8'd228) ||

(screen\_X == 9'd31 && screen\_Y == 8'd228)

) begin // P

pixel\_colour = colourful ? (((randNum\_12b[9:7] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[9:7] ^ randNum\_12b[4:2])) : 3'b111;

end

if ((screen\_X == 9'd33 && screen\_Y == 8'd230) ||

(screen\_X == 9'd33 && screen\_Y == 8'd231) ||

(screen\_X == 9'd33 && screen\_Y == 8'd232) ||

(screen\_X == 9'd33 && screen\_Y == 8'd233) ||

(screen\_X == 9'd33 && screen\_Y == 8'd234) ||

(screen\_X == 9'd33 && screen\_Y == 8'd235) ||

(screen\_X == 9'd33 && screen\_Y == 8'd236) ||

(screen\_X == 9'd34 && screen\_Y == 8'd231) ||

(screen\_X == 9'd35 && screen\_Y == 8'd231) ||

(screen\_X == 9'd36 && screen\_Y == 8'd231) ||

(screen\_X == 9'd37 && screen\_Y == 8'd231)

) begin // r

pixel\_colour = colourful ? (((randNum\_12b[9:7] ^ randNum\_12b[6:4]) == 3'b0) ? 3'b111 : (randNum\_12b[9:7] ^ randNum\_12b[6:4])) : 3'b111;

end

if ((screen\_X == 9'd41 && screen\_Y == 8'd227) ||

(screen\_X == 9'd41 && screen\_Y == 8'd228) ||

(screen\_X == 9'd41 && screen\_Y == 8'd229) ||

(screen\_X == 9'd41 && screen\_Y == 8'd230) ||

(screen\_X == 9'd41 && screen\_Y == 8'd231) ||

(screen\_X == 9'd41 && screen\_Y == 8'd232) ||

(screen\_X == 9'd41 && screen\_Y == 8'd233) ||

(screen\_X == 9'd41 && screen\_Y == 8'd234) ||

(screen\_X == 9'd41 && screen\_Y == 8'd235) ||

(screen\_X == 9'd41 && screen\_Y == 8'd236) ||

(screen\_X == 9'd42 && screen\_Y == 8'd227) ||

(screen\_X == 9'd43 && screen\_Y == 8'd227) ||

(screen\_X == 9'd44 && screen\_Y == 8'd227) ||

(screen\_X == 9'd45 && screen\_Y == 8'd227) ||

(screen\_X == 9'd42 && screen\_Y == 8'd236) ||

(screen\_X == 9'd43 && screen\_Y == 8'd236) ||

(screen\_X == 9'd44 && screen\_Y == 8'd236) ||

(screen\_X == 9'd42 && screen\_Y == 8'd231) ||

(screen\_X == 9'd43 && screen\_Y == 8'd231)

) begin // e

pixel\_colour = colourful ? (((randNum\_12b[8:6] ^ randNum\_12b[2:0]) == 3'b0) ? 3'b111 : (randNum\_12b[8:6] ^ randNum\_12b[2:0])) : 3'b111;

end

if ((screen\_X == 9'd48 && screen\_Y == 8'd227) ||

(screen\_X == 9'd49 && screen\_Y == 8'd227) ||

(screen\_X == 9'd50 && screen\_Y == 8'd227) ||

(screen\_X == 9'd48 && screen\_Y == 8'd235) ||

(screen\_X == 9'd49 && screen\_Y == 8'd235) ||

(screen\_X == 9'd50 && screen\_Y == 8'd231) ||

(screen\_X == 9'd50 && screen\_Y == 8'd232) ||

(screen\_X == 9'd50 && screen\_Y == 8'd233) ||

(screen\_X == 9'd50 && screen\_Y == 8'd234) ||

(screen\_X == 9'd50 && screen\_Y == 8'd235) ||

(screen\_X == 9'd48 && screen\_Y == 8'd228) ||

(screen\_X == 9'd48 && screen\_Y == 8'd229) ||

(screen\_X == 9'd48 && screen\_Y == 8'd230) ||

(screen\_X == 9'd48 && screen\_Y == 8'd231) ||

(screen\_X == 9'd49 && screen\_Y == 8'd231)

) begin // s

pixel\_colour = colourful ? (((randNum\_12b[8:6] ^ randNum\_12b[3:1]) == 3'b0) ? 3'b111 : (randNum\_12b[8:6] ^ randNum\_12b[3:1])) : 3'b111;

end

if ((screen\_X == 9'd53 && screen\_Y == 8'd226) ||

(screen\_X == 9'd54 && screen\_Y == 8'd226) ||

(screen\_X == 9'd55 && screen\_Y == 8'd226) ||

(screen\_X == 9'd56 && screen\_Y == 8'd226) ||

(screen\_X == 9'd52 && screen\_Y == 8'd233) ||

(screen\_X == 9'd53 && screen\_Y == 8'd233) ||

(screen\_X == 9'd54 && screen\_Y == 8'd233) ||

(screen\_X == 9'd54 && screen\_Y == 8'd229) ||

(screen\_X == 9'd53 && screen\_Y == 8'd227) ||

(screen\_X == 9'd53 && screen\_Y == 8'd228) ||

(screen\_X == 9'd53 && screen\_Y == 8'd229) ||

(screen\_X == 9'd55 && screen\_Y == 8'd229) ||

(screen\_X == 9'd55 && screen\_Y == 8'd230) ||

(screen\_X == 9'd55 && screen\_Y == 8'd231) ||

(screen\_X == 9'd55 && screen\_Y == 8'd232) ||

(screen\_X == 9'd55 && screen\_Y == 8'd233)

) begin // s

pixel\_colour = colourful ? (((randNum\_12b[8:6] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[8:6] ^ randNum\_12b[4:2])) : 3'b111;

end

if ((screen\_X == 9'd63 && screen\_Y == 8'd223) ||

(screen\_X == 9'd63 && screen\_Y == 8'd224) ||

(screen\_X == 9'd63 && screen\_Y == 8'd225) ||

(screen\_X == 9'd63 && screen\_Y == 8'd226) ||

(screen\_X == 9'd63 && screen\_Y == 8'd227) ||

(screen\_X == 9'd63 && screen\_Y == 8'd228) ||

(screen\_X == 9'd63 && screen\_Y == 8'd229) ||

(screen\_X == 9'd63 && screen\_Y == 8'd230) ||

(screen\_X == 9'd63 && screen\_Y == 8'd231) ||

(screen\_X == 9'd63 && screen\_Y == 8'd232) ||

(screen\_X == 9'd63 && screen\_Y == 8'd233) ||

(screen\_X == 9'd64 && screen\_Y == 8'd227) ||

(screen\_X == 9'd65 && screen\_Y == 8'd227) ||

(screen\_X == 9'd66 && screen\_Y == 8'd227) ||

(screen\_X == 9'd64 && screen\_Y == 8'd223) ||

(screen\_X == 9'd65 && screen\_Y == 8'd223) ||

(screen\_X == 9'd66 && screen\_Y == 8'd223) ||

(screen\_X == 9'd67 && screen\_Y == 8'd223) ||

(screen\_X == 9'd64 && screen\_Y == 8'd233) ||

(screen\_X == 9'd65 && screen\_Y == 8'd233) ||

(screen\_X == 9'd66 && screen\_Y == 8'd233) ||

(screen\_X == 9'd67 && screen\_Y == 8'd233) ||

(screen\_X == 9'd68 && screen\_Y == 8'd233)

) begin // E

pixel\_colour = colourful ? (((randNum\_12b[8:6] ^ randNum\_12b[7:5]) == 3'b0) ? 3'b111 : (randNum\_12b[8:6] ^ randNum\_12b[7:5])) : 3'b111;

end

if ((screen\_X == 9'd71 && screen\_Y == 8'd227) ||

(screen\_X == 9'd71 && screen\_Y == 8'd228) ||

(screen\_X == 9'd71 && screen\_Y == 8'd229) ||

(screen\_X == 9'd71 && screen\_Y == 8'd230) ||

(screen\_X == 9'd71 && screen\_Y == 8'd231) ||

(screen\_X == 9'd71 && screen\_Y == 8'd232) ||

(screen\_X == 9'd71 && screen\_Y == 8'd233) ||

(screen\_X == 9'd72 && screen\_Y == 8'd228) ||

(screen\_X == 9'd73 && screen\_Y == 8'd228) ||

(screen\_X == 9'd74 && screen\_Y == 8'd228) ||

(screen\_X == 9'd75 && screen\_Y == 8'd228) ||

(screen\_X == 9'd75 && screen\_Y == 8'd229) ||

(screen\_X == 9'd75 && screen\_Y == 8'd230) ||

(screen\_X == 9'd75 && screen\_Y == 8'd231) ||

(screen\_X == 9'd75 && screen\_Y == 8'd232) ||

(screen\_X == 9'd75 && screen\_Y == 8'd233)

) begin // n

pixel\_colour = colourful ? (((randNum\_12b[8:6] ^ randNum\_12b[8:6]) == 3'b0) ? 3'b111 : (randNum\_12b[8:6] ^ randNum\_12b[8:6])) : 3'b111;

end

if ((screen\_X == 9'd76 && screen\_Y == 8'd224) ||

(screen\_X == 9'd77 && screen\_Y == 8'd224) ||

(screen\_X == 9'd78 && screen\_Y == 8'd224) ||

(screen\_X == 9'd79 && screen\_Y == 8'd224) ||

(screen\_X == 9'd80 && screen\_Y == 8'd224) ||

(screen\_X == 9'd81 && screen\_Y == 8'd224) ||

(screen\_X == 9'd82 && screen\_Y == 8'd224) ||

(screen\_X == 9'd79 && screen\_Y == 8'd225) ||

(screen\_X == 9'd79 && screen\_Y == 8'd226) ||

(screen\_X == 9'd79 && screen\_Y == 8'd227) ||

(screen\_X == 9'd79 && screen\_Y == 8'd228) ||

(screen\_X == 9'd79 && screen\_Y == 8'd229) ||

(screen\_X == 9'd79 && screen\_Y == 8'd230) ||

(screen\_X == 9'd79 && screen\_Y == 8'd231) ||

(screen\_X == 9'd79 && screen\_Y == 8'd232) ||

(screen\_X == 9'd79 && screen\_Y == 8'd233)

) begin // t

pixel\_colour = colourful ? (((randNum\_12b[7:5] ^ randNum\_12b[2:0]) == 3'b0) ? 3'b111 : (randNum\_12b[7:5] ^ randNum\_12b[2:0])) : 3'b111;

end

if ((screen\_X == 9'd83 && screen\_Y == 8'd225) ||

(screen\_X == 9'd83 && screen\_Y == 8'd226) ||

(screen\_X == 9'd83 && screen\_Y == 8'd227) ||

(screen\_X == 9'd83 && screen\_Y == 8'd228) ||

(screen\_X == 9'd83 && screen\_Y == 8'd229) ||

(screen\_X == 9'd83 && screen\_Y == 8'd230) ||

(screen\_X == 9'd83 && screen\_Y == 8'd231) ||

(screen\_X == 9'd83 && screen\_Y == 8'd232) ||

(screen\_X == 9'd83 && screen\_Y == 8'd233) ||

(screen\_X == 9'd84 && screen\_Y == 8'd225) ||

(screen\_X == 9'd85 && screen\_Y == 8'd225) ||

(screen\_X == 9'd86 && screen\_Y == 8'd225) ||

(screen\_X == 9'd84 && screen\_Y == 8'd230) ||

(screen\_X == 9'd85 && screen\_Y == 8'd230) ||

(screen\_X == 9'd84 && screen\_Y == 8'd233) ||

(screen\_X == 9'd85 && screen\_Y == 8'd233) ||

(screen\_X == 9'd86 && screen\_Y == 8'd233)

) begin // e

pixel\_colour = colourful ? (((randNum\_12b[7:5] ^ randNum\_12b[3:1]) == 3'b0) ? 3'b111 : (randNum\_12b[7:5] ^ randNum\_12b[3:1])) : 3'b111;

end

if ((screen\_X == 9'd89 && screen\_Y == 8'd223) ||

(screen\_X == 9'd89 && screen\_Y == 8'd224) ||

(screen\_X == 9'd89 && screen\_Y == 8'd225) ||

(screen\_X == 9'd89 && screen\_Y == 8'd226) ||

(screen\_X == 9'd89 && screen\_Y == 8'd227) ||

(screen\_X == 9'd89 && screen\_Y == 8'd228) ||

(screen\_X == 9'd89 && screen\_Y == 8'd229) ||

(screen\_X == 9'd89 && screen\_Y == 8'd230) ||

(screen\_X == 9'd89 && screen\_Y == 8'd231) ||

(screen\_X == 9'd89 && screen\_Y == 8'd232) ||

(screen\_X == 9'd89 && screen\_Y == 8'd233) ||

(screen\_X == 9'd90 && screen\_Y == 8'd223) ||

(screen\_X == 9'd91 && screen\_Y == 8'd223) ||

(screen\_X == 9'd92 && screen\_Y == 8'd223) ||

(screen\_X == 9'd93 && screen\_Y == 8'd223) ||

(screen\_X == 9'd93 && screen\_Y == 8'd224) ||

(screen\_X == 9'd93 && screen\_Y == 8'd225) ||

(screen\_X == 9'd93 && screen\_Y == 8'd226) ||

(screen\_X == 9'd93 && screen\_Y == 8'd227) ||

(screen\_X == 9'd90 && screen\_Y == 8'd227) ||

(screen\_X == 9'd91 && screen\_Y == 8'd227) ||

(screen\_X == 9'd92 && screen\_Y == 8'd227) ||

(screen\_X == 9'd92 && screen\_Y == 8'd228) ||

(screen\_X == 9'd92 && screen\_Y == 8'd229) ||

(screen\_X == 9'd93 && screen\_Y == 8'd230) ||

(screen\_X == 9'd93 && screen\_Y == 8'd231) ||

(screen\_X == 9'd94 && screen\_Y == 8'd232)

) begin // r

pixel\_colour = colourful ? (((randNum\_12b[7:5] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[7:5] ^ randNum\_12b[4:2])) : 3'b111;

end

if ((screen\_X == 9'd100 && screen\_Y == 8'd223) ||

(screen\_X == 9'd101 && screen\_Y == 8'd223) ||

(screen\_X == 9'd102 && screen\_Y == 8'd223) ||

(screen\_X == 9'd103 && screen\_Y == 8'd223) ||

(screen\_X == 9'd104 && screen\_Y == 8'd223) ||

(screen\_X == 9'd105 && screen\_Y == 8'd223) ||

(screen\_X == 9'd106 && screen\_Y == 8'd223) ||

(screen\_X == 9'd103 && screen\_Y == 8'd224) ||

(screen\_X == 9'd103 && screen\_Y == 8'd225) ||

(screen\_X == 9'd103 && screen\_Y == 8'd226) ||

(screen\_X == 9'd103 && screen\_Y == 8'd227) ||

(screen\_X == 9'd103 && screen\_Y == 8'd228) ||

(screen\_X == 9'd103 && screen\_Y == 8'd229) ||

(screen\_X == 9'd103 && screen\_Y == 8'd230) ||

(screen\_X == 9'd103 && screen\_Y == 8'd231) ||

(screen\_X == 9'd103 && screen\_Y == 8'd232) ||

(screen\_X == 9'd103 && screen\_Y == 8'd233)

) begin // T

pixel\_colour = colourful ? (((randNum\_12b[7:5] ^ randNum\_12b[5:3]) == 3'b0) ? 3'b111 : (randNum\_12b[7:5] ^ randNum\_12b[5:3])) : 3'b111;

end

if ((screen\_X == 9'd107 && screen\_Y == 8'd227) ||

(screen\_X == 9'd107 && screen\_Y == 8'd228) ||

(screen\_X == 9'd107 && screen\_Y == 8'd229) ||

(screen\_X == 9'd107 && screen\_Y == 8'd230) ||

(screen\_X == 9'd107 && screen\_Y == 8'd231) ||

(screen\_X == 9'd107 && screen\_Y == 8'd232) ||

(screen\_X == 9'd111 && screen\_Y == 8'd227) ||

(screen\_X == 9'd111 && screen\_Y == 8'd228) ||

(screen\_X == 9'd111 && screen\_Y == 8'd229) ||

(screen\_X == 9'd111 && screen\_Y == 8'd230) ||

(screen\_X == 9'd111 && screen\_Y == 8'd231) ||

(screen\_X == 9'd111 && screen\_Y == 8'd232) ||

(screen\_X == 9'd107 && screen\_Y == 8'd227) ||

(screen\_X == 9'd108 && screen\_Y == 8'd227) ||

(screen\_X == 9'd109 && screen\_Y == 8'd227) ||

(screen\_X == 9'd107 && screen\_Y == 8'd232) ||

(screen\_X == 9'd108 && screen\_Y == 8'd232) ||

(screen\_X == 9'd109 && screen\_Y == 8'd232)

) begin // o

pixel\_colour = colourful ? (((randNum\_12b[7:5] ^ randNum\_12b[6:4]) == 3'b0) ? 3'b111 : (randNum\_12b[7:5] ^ randNum\_12b[6:4])) : 3'b111;

end

if ((screen\_X == 9'd118 && screen\_Y == 8'd222) ||

(screen\_X == 9'd118 && screen\_Y == 8'd223) ||

(screen\_X == 9'd118 && screen\_Y == 8'd224) ||

(screen\_X == 9'd118 && screen\_Y == 8'd225) ||

(screen\_X == 9'd118 && screen\_Y == 8'd226) ||

(screen\_X == 9'd118 && screen\_Y == 8'd227) ||

(screen\_X == 9'd118 && screen\_Y == 8'd228) ||

(screen\_X == 9'd118 && screen\_Y == 8'd229) ||

(screen\_X == 9'd118 && screen\_Y == 8'd230) ||

(screen\_X == 9'd118 && screen\_Y == 8'd231) ||

(screen\_X == 9'd118 && screen\_Y == 8'd232) ||

(screen\_X == 9'd118 && screen\_Y == 8'd233) ||

(screen\_X == 9'd123 && screen\_Y == 8'd222) ||

(screen\_X == 9'd123 && screen\_Y == 8'd223) ||

(screen\_X == 9'd123 && screen\_Y == 8'd224) ||

(screen\_X == 9'd123 && screen\_Y == 8'd225) ||

(screen\_X == 9'd123 && screen\_Y == 8'd226) ||

(screen\_X == 9'd121 && screen\_Y == 8'd228) ||

(screen\_X == 9'd121 && screen\_Y == 8'd229) ||

(screen\_X == 9'd121 && screen\_Y == 8'd230) ||

(screen\_X == 9'd119 && screen\_Y == 8'd222) ||

(screen\_X == 9'd120 && screen\_Y == 8'd222) ||

(screen\_X == 9'd121 && screen\_Y == 8'd222) ||

(screen\_X == 9'd122 && screen\_Y == 8'd222) ||

(screen\_X == 9'd119 && screen\_Y == 8'd226) ||

(screen\_X == 9'd120 && screen\_Y == 8'd226) ||

(screen\_X == 9'd121 && screen\_Y == 8'd226) ||

(screen\_X == 9'd122 && screen\_Y == 8'd226) ||

(screen\_X == 9'd122 && screen\_Y == 8'd231) ||

(screen\_X == 9'd122 && screen\_Y == 8'd232) ||

(screen\_X == 9'd120 && screen\_Y == 8'd227)

) begin // R

pixel\_colour = colourful ? (((randNum\_12b[7:5] ^ randNum\_12b[7:5]) == 3'b0) ? 3'b111 : (randNum\_12b[7:5] ^ randNum\_12b[7:5])) : 3'b111;

end

if ((screen\_X == 9'd125 && screen\_Y == 8'd222) ||

(screen\_X == 9'd125 && screen\_Y == 8'd223) ||

(screen\_X == 9'd125 && screen\_Y == 8'd224) ||

(screen\_X == 9'd125 && screen\_Y == 8'd225) ||

(screen\_X == 9'd125 && screen\_Y == 8'd226) ||

(screen\_X == 9'd125 && screen\_Y == 8'd227) ||

(screen\_X == 9'd125 && screen\_Y == 8'd228) ||

(screen\_X == 9'd125 && screen\_Y == 8'd229) ||

(screen\_X == 9'd125 && screen\_Y == 8'd230) ||

(screen\_X == 9'd125 && screen\_Y == 8'd231) ||

(screen\_X == 9'd126 && screen\_Y == 8'd222) ||

(screen\_X == 9'd127 && screen\_Y == 8'd222) ||

(screen\_X == 9'd128 && screen\_Y == 8'd222) ||

(screen\_X == 9'd129 && screen\_Y == 8'd222) ||

(screen\_X == 9'd126 && screen\_Y == 8'd226) ||

(screen\_X == 9'd127 && screen\_Y == 8'd226) ||

(screen\_X == 9'd126 && screen\_Y == 8'd231) ||

(screen\_X == 9'd127 && screen\_Y == 8'd231) ||

(screen\_X == 9'd128 && screen\_Y == 8'd231) ||

(screen\_X == 9'd129 && screen\_Y == 8'd231)

) begin // e

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[2:0]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[2:0])) : 3'b111;

end

if ((screen\_X == 9'd131 && screen\_Y == 8'd222) ||

(screen\_X == 9'd131 && screen\_Y == 8'd223) ||

(screen\_X == 9'd131 && screen\_Y == 8'd224) ||

(screen\_X == 9'd131 && screen\_Y == 8'd225) ||

(screen\_X == 9'd131 && screen\_Y == 8'd226) ||

(screen\_X == 9'd134 && screen\_Y == 8'd226) ||

(screen\_X == 9'd134 && screen\_Y == 8'd227) ||

(screen\_X == 9'd134 && screen\_Y == 8'd228) ||

(screen\_X == 9'd134 && screen\_Y == 8'd229) ||

(screen\_X == 9'd134 && screen\_Y == 8'd230) ||

(screen\_X == 9'd134 && screen\_Y == 8'd231) ||

(screen\_X == 9'd132 && screen\_Y == 8'd222) ||

(screen\_X == 9'd133 && screen\_Y == 8'd222) ||

(screen\_X == 9'd134 && screen\_Y == 8'd222) ||

(screen\_X == 9'd131 && screen\_Y == 8'd231) ||

(screen\_X == 9'd132 && screen\_Y == 8'd231) ||

(screen\_X == 9'd133 && screen\_Y == 8'd231) ||

(screen\_X == 9'd132 && screen\_Y == 8'd226) ||

(screen\_X == 9'd133 && screen\_Y == 8'd226)

) begin // s

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[11:9]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[11:9])) : 3'b111;

end

if ((screen\_X == 9'd137 && screen\_Y == 8'd222) ||

(screen\_X == 9'd138 && screen\_Y == 8'd222) ||

(screen\_X == 9'd139 && screen\_Y == 8'd222) ||

(screen\_X == 9'd136 && screen\_Y == 8'd221) ||

(screen\_X == 9'd136 && screen\_Y == 8'd222) ||

(screen\_X == 9'd136 && screen\_Y == 8'd223) ||

(screen\_X == 9'd136 && screen\_Y == 8'd224) ||

(screen\_X == 9'd136 && screen\_Y == 8'd225) ||

(screen\_X == 9'd136 && screen\_Y == 8'd226) ||

(screen\_X == 9'd136 && screen\_Y == 8'd227) ||

(screen\_X == 9'd136 && screen\_Y == 8'd228) ||

(screen\_X == 9'd136 && screen\_Y == 8'd229) ||

(screen\_X == 9'd136 && screen\_Y == 8'd230) ||

(screen\_X == 9'd136 && screen\_Y == 8'd231) ||

(screen\_X == 9'd137 && screen\_Y == 8'd226) ||

(screen\_X == 9'd138 && screen\_Y == 8'd226) ||

(screen\_X == 9'd139 && screen\_Y == 8'd226) ||

(screen\_X == 9'd137 && screen\_Y == 8'd231) ||

(screen\_X == 9'd138 && screen\_Y == 8'd231) ||

(screen\_X == 9'd139 && screen\_Y == 8'd231) ||

(screen\_X == 9'd140 && screen\_Y == 8'd231)

) begin // e

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[3:1]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[3:1])) : 3'b111;

end

if ((screen\_X == 9'd141 && screen\_Y == 8'd222) ||

(screen\_X == 9'd142 && screen\_Y == 8'd222) ||

(screen\_X == 9'd143 && screen\_Y == 8'd222) ||

(screen\_X == 9'd144 && screen\_Y == 8'd222) ||

(screen\_X == 9'd145 && screen\_Y == 8'd222) ||

(screen\_X == 9'd143 && screen\_Y == 8'd223) ||

(screen\_X == 9'd143 && screen\_Y == 8'd224) ||

(screen\_X == 9'd143 && screen\_Y == 8'd225) ||

(screen\_X == 9'd143 && screen\_Y == 8'd226) ||

(screen\_X == 9'd143 && screen\_Y == 8'd227) ||

(screen\_X == 9'd143 && screen\_Y == 8'd228) ||

(screen\_X == 9'd143 && screen\_Y == 8'd229) ||

(screen\_X == 9'd143 && screen\_Y == 8'd230) ||

(screen\_X == 9'd143 && screen\_Y == 8'd231) ||

(screen\_X == 9'd143 && screen\_Y == 8'd232) ||

(screen\_X == 9'd143 && screen\_Y == 8'd233) ||

(screen\_X == 9'd143 && screen\_Y == 8'd234)

) begin // t

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[4:2])) : 3'b111;

end

if ((screen\_X == 9'd207 && screen\_Y == 8'd227) ||

(screen\_X == 9'd208 && screen\_Y == 8'd227) ||

(screen\_X == 9'd209 && screen\_Y == 8'd227) ||

(screen\_X == 9'd210 && screen\_Y == 8'd227) ||

(screen\_X == 9'd211 && screen\_Y == 8'd227) ||

(screen\_X == 9'd212 && screen\_Y == 8'd227) ||

(screen\_X == 9'd209 && screen\_Y == 8'd228) ||

(screen\_X == 9'd209 && screen\_Y == 8'd229) ||

(screen\_X == 9'd209 && screen\_Y == 8'd230) ||

(screen\_X == 9'd209 && screen\_Y == 8'd231) ||

(screen\_X == 9'd209 && screen\_Y == 8'd232) ||

(screen\_X == 9'd209 && screen\_Y == 8'd233) ||

(screen\_X == 9'd209 && screen\_Y == 8'd234) ||

(screen\_X == 9'd209 && screen\_Y == 8'd235)

) begin // T

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[5:3]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[5:3])) : 3'b111;

end

if ((screen\_X == 9'd215 && screen\_Y == 8'd227) ||

(screen\_X == 9'd215 && screen\_Y == 8'd228) ||

(screen\_X == 9'd215 && screen\_Y == 8'd229) ||

(screen\_X == 9'd215 && screen\_Y == 8'd230) ||

(screen\_X == 9'd215 && screen\_Y == 8'd231) ||

(screen\_X == 9'd215 && screen\_Y == 8'd232) ||

(screen\_X == 9'd215 && screen\_Y == 8'd233) ||

(screen\_X == 9'd215 && screen\_Y == 8'd234) ||

(screen\_X == 9'd215 && screen\_Y == 8'd235) ||

(screen\_X == 9'd215 && screen\_Y == 8'd236) ||

(screen\_X == 9'd219 && screen\_Y == 8'd226) ||

(screen\_X == 9'd219 && screen\_Y == 8'd227) ||

(screen\_X == 9'd219 && screen\_Y == 8'd228) ||

(screen\_X == 9'd219 && screen\_Y == 8'd229) ||

(screen\_X == 9'd219 && screen\_Y == 8'd230) ||

(screen\_X == 9'd219 && screen\_Y == 8'd231) ||

(screen\_X == 9'd219 && screen\_Y == 8'd232) ||

(screen\_X == 9'd219 && screen\_Y == 8'd233) ||

(screen\_X == 9'd219 && screen\_Y == 8'd234) ||

(screen\_X == 9'd219 && screen\_Y == 8'd235) ||

(screen\_X == 9'd216 && screen\_Y == 8'd232) ||

(screen\_X == 9'd217 && screen\_Y == 8'd232) ||

(screen\_X == 9'd218 && screen\_Y == 8'd232)

) begin // h

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[6:4]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[6:4])) : 3'b111;

end

if ((screen\_X == 9'd222 && screen\_Y == 8'd227) ||

(screen\_X == 9'd231 && screen\_Y == 8'd227) ||

(screen\_X == 9'd223 && screen\_Y == 8'd228) ||

(screen\_X == 9'd230 && screen\_Y == 8'd228) ||

(screen\_X == 9'd224 && screen\_Y == 8'd229) ||

(screen\_X == 9'd229 && screen\_Y == 8'd229) ||

(screen\_X == 9'd225 && screen\_Y == 8'd230) ||

(screen\_X == 9'd228 && screen\_Y == 8'd230) ||

(screen\_X == 9'd226 && screen\_Y == 8'd231) ||

(screen\_X == 9'd227 && screen\_Y == 8'd231) ||

(screen\_X == 9'd225 && screen\_Y == 8'd232) ||

(screen\_X == 9'd228 && screen\_Y == 8'd232) ||

(screen\_X == 9'd224 && screen\_Y == 8'd233) ||

(screen\_X == 9'd229 && screen\_Y == 8'd233) ||

(screen\_X == 9'd223 && screen\_Y == 8'd234) ||

(screen\_X == 9'd230 && screen\_Y == 8'd234) ||

(screen\_X == 9'd222 && screen\_Y == 8'd235) ||

(screen\_X == 9'd231 && screen\_Y == 8'd235) ||

(screen\_X == 9'd221 && screen\_Y == 8'd236)

) begin // x

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[7:5]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[7:5])) : 3'b111;

end

if ((screen\_X == 9'd240 && screen\_Y == 8'd226) ||

(screen\_X == 9'd240 && screen\_Y == 8'd227) ||

(screen\_X == 9'd240 && screen\_Y == 8'd228) ||

(screen\_X == 9'd240 && screen\_Y == 8'd229) ||

(screen\_X == 9'd240 && screen\_Y == 8'd230) ||

(screen\_X == 9'd240 && screen\_Y == 8'd231) ||

(screen\_X == 9'd240 && screen\_Y == 8'd232) ||

(screen\_X == 9'd240 && screen\_Y == 8'd233) ||

(screen\_X == 9'd240 && screen\_Y == 8'd234) ||

(screen\_X == 9'd240 && screen\_Y == 8'd235) ||

(screen\_X == 9'd240 && screen\_Y == 8'd236) ||

(screen\_X == 9'd241 && screen\_Y == 8'd227) ||

(screen\_X == 9'd242 && screen\_Y == 8'd227) ||

(screen\_X == 9'd243 && screen\_Y == 8'd227) ||

(screen\_X == 9'd244 && screen\_Y == 8'd227) ||

(screen\_X == 9'd245 && screen\_Y == 8'd227) ||

(screen\_X == 9'd246 && screen\_Y == 8'd227) ||

(screen\_X == 9'd241 && screen\_Y == 8'd231) ||

(screen\_X == 9'd242 && screen\_Y == 8'd231) ||

(screen\_X == 9'd243 && screen\_Y == 8'd231)

) begin // F

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[8:6]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[8:6])) : 3'b111;

end

if ((screen\_X == 9'd246 && screen\_Y == 8'd230) ||

(screen\_X == 9'd246 && screen\_Y == 8'd231) ||

(screen\_X == 9'd246 && screen\_Y == 8'd232) ||

(screen\_X == 9'd246 && screen\_Y == 8'd233) ||

(screen\_X == 9'd246 && screen\_Y == 8'd234) ||

(screen\_X == 9'd246 && screen\_Y == 8'd235) ||

(screen\_X == 9'd246 && screen\_Y == 8'd236) ||

(screen\_X == 9'd250 && screen\_Y == 8'd230) ||

(screen\_X == 9'd250 && screen\_Y == 8'd231) ||

(screen\_X == 9'd250 && screen\_Y == 8'd232) ||

(screen\_X == 9'd250 && screen\_Y == 8'd233) ||

(screen\_X == 9'd250 && screen\_Y == 8'd234) ||

(screen\_X == 9'd250 && screen\_Y == 8'd235) ||

(screen\_X == 9'd250 && screen\_Y == 8'd236) ||

(screen\_X == 9'd247 && screen\_Y == 8'd230) ||

(screen\_X == 9'd248 && screen\_Y == 8'd230) ||

(screen\_X == 9'd249 && screen\_Y == 8'd230) ||

(screen\_X == 9'd247 && screen\_Y == 8'd236) ||

(screen\_X == 9'd248 && screen\_Y == 8'd236) ||

(screen\_X == 9'd249 && screen\_Y == 8'd236)

) begin // o

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[9:7]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[9:7])) : 3'b111;

end

if ((screen\_X == 9'd253 && screen\_Y == 8'd230) ||

(screen\_X == 9'd253 && screen\_Y == 8'd231) ||

(screen\_X == 9'd253 && screen\_Y == 8'd232) ||

(screen\_X == 9'd253 && screen\_Y == 8'd233) ||

(screen\_X == 9'd253 && screen\_Y == 8'd234) ||

(screen\_X == 9'd253 && screen\_Y == 8'd235) ||

(screen\_X == 9'd254 && screen\_Y == 8'd231) ||

(screen\_X == 9'd255 && screen\_Y == 8'd231) ||

(screen\_X == 9'd256 && screen\_Y == 8'd231) ||

(screen\_X == 9'd257 && screen\_Y == 8'd231)

) begin // r

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[10:8]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[10:8])) : 3'b111;

end

if ((screen\_X == 9'd266 && screen\_Y == 8'd223) ||

(screen\_X == 9'd266 && screen\_Y == 8'd224) ||

(screen\_X == 9'd266 && screen\_Y == 8'd225) ||

(screen\_X == 9'd266 && screen\_Y == 8'd226) ||

(screen\_X == 9'd266 && screen\_Y == 8'd227) ||

(screen\_X == 9'd266 && screen\_Y == 8'd228) ||

(screen\_X == 9'd266 && screen\_Y == 8'd229) ||

(screen\_X == 9'd266 && screen\_Y == 8'd230) ||

(screen\_X == 9'd266 && screen\_Y == 8'd231) ||

(screen\_X == 9'd266 && screen\_Y == 8'd232) ||

(screen\_X == 9'd266 && screen\_Y == 8'd233) ||

(screen\_X == 9'd266 && screen\_Y == 8'd234) ||

(screen\_X == 9'd266 && screen\_Y == 8'd235) ||

(screen\_X == 9'd266 && screen\_Y == 8'd236) ||

(screen\_X == 9'd271 && screen\_Y == 8'd224) ||

(screen\_X == 9'd271 && screen\_Y == 8'd225) ||

(screen\_X == 9'd271 && screen\_Y == 8'd226) ||

(screen\_X == 9'd271 && screen\_Y == 8'd227) ||

(screen\_X == 9'd271 && screen\_Y == 8'd228) ||

(screen\_X == 9'd271 && screen\_Y == 8'd229) ||

(screen\_X == 9'd271 && screen\_Y == 8'd230) ||

(screen\_X == 9'd267 && screen\_Y == 8'd224) ||

(screen\_X == 9'd268 && screen\_Y == 8'd224) ||

(screen\_X == 9'd269 && screen\_Y == 8'd224) ||

(screen\_X == 9'd270 && screen\_Y == 8'd224) ||

(screen\_X == 9'd267 && screen\_Y == 8'd230) ||

(screen\_X == 9'd268 && screen\_Y == 8'd230) ||

(screen\_X == 9'd269 && screen\_Y == 8'd230) ||

(screen\_X == 9'd270 && screen\_Y == 8'd230)

) begin // P

pixel\_colour = colourful ? (((randNum\_12b[3:1] ^ randNum\_12b[2:0]) == 3'b0) ? 3'b111 : (randNum\_12b[3:1] ^ randNum\_12b[2:0])) : 3'b111;

end

if ((screen\_X == 9'd273 && screen\_Y == 8'd226) ||

(screen\_X == 9'd273 && screen\_Y == 8'd227) ||

(screen\_X == 9'd273 && screen\_Y == 8'd228) ||

(screen\_X == 9'd273 && screen\_Y == 8'd229) ||

(screen\_X == 9'd273 && screen\_Y == 8'd230) ||

(screen\_X == 9'd273 && screen\_Y == 8'd231) ||

(screen\_X == 9'd273 && screen\_Y == 8'd232) ||

(screen\_X == 9'd273 && screen\_Y == 8'd233) ||

(screen\_X == 9'd273 && screen\_Y == 8'd234) ||

(screen\_X == 9'd273 && screen\_Y == 8'd235) ||

(screen\_X == 9'd273 && screen\_Y == 8'd236) ||

(screen\_X == 9'd273 && screen\_Y == 8'd237) ||

(screen\_X == 9'd273 && screen\_Y == 8'd238) ||

(screen\_X == 9'd274 && screen\_Y == 8'd238) ||

(screen\_X == 9'd275 && screen\_Y == 8'd238) ||

(screen\_X == 9'd276 && screen\_Y == 8'd238) ||

(screen\_X == 9'd277 && screen\_Y == 8'd238) ||

(screen\_X == 9'd278 && screen\_Y == 8'd238) ||

(screen\_X == 9'd279 && screen\_Y == 8'd238) ||

(screen\_X == 9'd280 && screen\_Y == 8'd238)

) begin // l

pixel\_colour = colourful ? (((randNum\_12b[3:1] ^ randNum\_12b[3:1]) == 3'b0) ? 3'b111 : (randNum\_12b[3:1] ^ randNum\_12b[3:1])) : 3'b111;

end

if ((screen\_X == 9'd279 && screen\_Y == 8'd225) ||

(screen\_X == 9'd279 && screen\_Y == 8'd226) ||

(screen\_X == 9'd279 && screen\_Y == 8'd227) ||

(screen\_X == 9'd279 && screen\_Y == 8'd228) ||

(screen\_X == 9'd279 && screen\_Y == 8'd229) ||

(screen\_X == 9'd279 && screen\_Y == 8'd230) ||

(screen\_X == 9'd279 && screen\_Y == 8'd231) ||

(screen\_X == 9'd279 && screen\_Y == 8'd232) ||

(screen\_X == 9'd279 && screen\_Y == 8'd233) ||

(screen\_X == 9'd279 && screen\_Y == 8'd234) ||

(screen\_X == 9'd279 && screen\_Y == 8'd235) ||

(screen\_X == 9'd285 && screen\_Y == 8'd225) ||

(screen\_X == 9'd285 && screen\_Y == 8'd226) ||

(screen\_X == 9'd285 && screen\_Y == 8'd227) ||

(screen\_X == 9'd285 && screen\_Y == 8'd228) ||

(screen\_X == 9'd285 && screen\_Y == 8'd229) ||

(screen\_X == 9'd285 && screen\_Y == 8'd230) ||

(screen\_X == 9'd285 && screen\_Y == 8'd231) ||

(screen\_X == 9'd285 && screen\_Y == 8'd232) ||

(screen\_X == 9'd285 && screen\_Y == 8'd233) ||

(screen\_X == 9'd285 && screen\_Y == 8'd234) ||

(screen\_X == 9'd285 && screen\_Y == 8'd235) ||

(screen\_X == 9'd285 && screen\_Y == 8'd236) ||

(screen\_X == 9'd280 && screen\_Y == 8'd225) ||

(screen\_X == 9'd281 && screen\_Y == 8'd225) ||

(screen\_X == 9'd282 && screen\_Y == 8'd225) ||

(screen\_X == 9'd283 && screen\_Y == 8'd225) ||

(screen\_X == 9'd284 && screen\_Y == 8'd225) ||

(screen\_X == 9'd280 && screen\_Y == 8'd230) ||

(screen\_X == 9'd281 && screen\_Y == 8'd230) ||

(screen\_X == 9'd282 && screen\_Y == 8'd230) ||

(screen\_X == 9'd283 && screen\_Y == 8'd230) ||

(screen\_X == 9'd284 && screen\_Y == 8'd230)

) begin // a

pixel\_colour = colourful ? (((randNum\_12b[3:1] ^ randNum\_12b[4:3]) == 3'b0) ? 3'b111 : (randNum\_12b[3:1] ^ randNum\_12b[4:3])) : 3'b111;

end

if ((screen\_X == 9'd288 && screen\_Y == 8'd223) ||

(screen\_X == 9'd288 && screen\_Y == 8'd224) ||

(screen\_X == 9'd288 && screen\_Y == 8'd225) ||

(screen\_X == 9'd288 && screen\_Y == 8'd226) ||

(screen\_X == 9'd288 && screen\_Y == 8'd227) ||

(screen\_X == 9'd288 && screen\_Y == 8'd228) ||

(screen\_X == 9'd288 && screen\_Y == 8'd229) ||

(screen\_X == 9'd288 && screen\_Y == 8'd230) ||

(screen\_X == 9'd288 && screen\_Y == 8'd231) ||

(screen\_X == 9'd288 && screen\_Y == 8'd232) ||

(screen\_X == 9'd288 && screen\_Y == 8'd233) ||

(screen\_X == 9'd288 && screen\_Y == 8'd234) ||

(screen\_X == 9'd288 && screen\_Y == 8'd235) ||

(screen\_X == 9'd288 && screen\_Y == 8'd236) ||

(screen\_X == 9'd289 && screen\_Y == 8'd223) ||

(screen\_X == 9'd290 && screen\_Y == 8'd223) ||

(screen\_X == 9'd291 && screen\_Y == 8'd223) ||

(screen\_X == 9'd292 && screen\_Y == 8'd223) ||

(screen\_X == 9'd293 && screen\_Y == 8'd223) ||

(screen\_X == 9'd289 && screen\_Y == 8'd229) ||

(screen\_X == 9'd290 && screen\_Y == 8'd229) ||

(screen\_X == 9'd291 && screen\_Y == 8'd229) ||

(screen\_X == 9'd292 && screen\_Y == 8'd229) ||

(screen\_X == 9'd289 && screen\_Y == 8'd235) ||

(screen\_X == 9'd290 && screen\_Y == 8'd235) ||

(screen\_X == 9'd291 && screen\_Y == 8'd235) ||

(screen\_X == 9'd292 && screen\_Y == 8'd235) ||

(screen\_X == 9'd293 && screen\_Y == 8'd235) ||

(screen\_X == 9'd294 && screen\_Y == 8'd235) ||

(screen\_X == 9'd295 && screen\_Y == 8'd235) ||

(screen\_X == 9'd296 && screen\_Y == 8'd235)

) begin // e

pixel\_colour = colourful ? (((randNum\_12b[3:1] ^ randNum\_12b[7:5]) == 3'b0) ? 3'b111 : (randNum\_12b[3:1] ^ randNum\_12b[7:5])) : 3'b111;

end

end

end

if (sig\_drawBoard) begin

if (screen\_X >= 9'd240 && screen\_X <= 9'd319 && screen\_Y <= 8'd119) begin

if ((screen\_X == 9'd247 && screen\_Y == 8'd8) ||

(screen\_X == 9'd247 && screen\_Y == 8'd9) ||

(screen\_X == 9'd247 && screen\_Y == 8'd10) ||

(screen\_X == 9'd247 && screen\_Y == 8'd11) ||

(screen\_X == 9'd247 && screen\_Y == 8'd12) ||

(screen\_X == 9'd247 && screen\_Y == 8'd13) ||

(screen\_X == 9'd247 && screen\_Y == 8'd14) ||

(screen\_X == 9'd247 && screen\_Y == 8'd15) ||

(screen\_X == 9'd247 && screen\_Y == 8'd16) ||

(screen\_X == 9'd247 && screen\_Y == 8'd17) ||

(screen\_X == 9'd247 && screen\_Y == 8'd18) ||

(screen\_X == 9'd247 && screen\_Y == 8'd19) ||

(screen\_X == 9'd247 && screen\_Y == 8'd20) ||

(screen\_X == 9'd248 && screen\_Y == 8'd13) ||

(screen\_X == 9'd249 && screen\_Y == 8'd13) ||

(screen\_X == 9'd250 && screen\_Y == 8'd13) ||

(screen\_X == 9'd251 && screen\_Y == 8'd13) ||

(screen\_X == 9'd252 && screen\_Y == 8'd13) ||

(screen\_X == 9'd253 && screen\_Y == 8'd13) ||

(screen\_X == 9'd254 && screen\_Y == 8'd13) ||

(screen\_X == 9'd255 && screen\_Y == 8'd8) ||

(screen\_X == 9'd255 && screen\_Y == 8'd9) ||

(screen\_X == 9'd255 && screen\_Y == 8'd10) ||

(screen\_X == 9'd255 && screen\_Y == 8'd11) ||

(screen\_X == 9'd255 && screen\_Y == 8'd12) ||

(screen\_X == 9'd255 && screen\_Y == 8'd13) ||

(screen\_X == 9'd255 && screen\_Y == 8'd14) ||

(screen\_X == 9'd255 && screen\_Y == 8'd15) ||

(screen\_X == 9'd255 && screen\_Y == 8'd16) ||

(screen\_X == 9'd255 && screen\_Y == 8'd17) ||

(screen\_X == 9'd255 && screen\_Y == 8'd18) ||

(screen\_X == 9'd255 && screen\_Y == 8'd19) ||

(screen\_X == 9'd255 && screen\_Y == 8'd20)

) begin // H

pixel\_colour = colourful ? ((randNum\_12b[11:9] == 3'b0) ? 3'b111 : randNum\_12b[11:9]) : 3'b111;

end

if ((screen\_X == 9'd258 && screen\_Y == 8'd9) ||

(screen\_X == 9'd258 && screen\_Y == 8'd12) ||

(screen\_X == 9'd258 && screen\_Y == 8'd13) ||

(screen\_X == 9'd258 && screen\_Y == 8'd14) ||

(screen\_X == 9'd258 && screen\_Y == 8'd15) ||

(screen\_X == 9'd258 && screen\_Y == 8'd16) ||

(screen\_X == 9'd258 && screen\_Y == 8'd17) ||

(screen\_X == 9'd258 && screen\_Y == 8'd18)

) begin // i

pixel\_colour = colourful ? ((randNum\_12b[10:8] == 3'b0) ? 3'b111 : randNum\_12b[10:8]) : 3'b111;

end

if ((screen\_X == 9'd261 && screen\_Y == 8'd12) ||

(screen\_X == 9'd261 && screen\_Y == 8'd13) ||

(screen\_X == 9'd261 && screen\_Y == 8'd14) ||

(screen\_X == 9'd261 && screen\_Y == 8'd15) ||

(screen\_X == 9'd261 && screen\_Y == 8'd16) ||

(screen\_X == 9'd261 && screen\_Y == 8'd17) ||

(screen\_X == 9'd261 && screen\_Y == 8'd18) ||

(screen\_X == 9'd265 && screen\_Y == 8'd12) ||

(screen\_X == 9'd265 && screen\_Y == 8'd13) ||

(screen\_X == 9'd265 && screen\_Y == 8'd14) ||

(screen\_X == 9'd265 && screen\_Y == 8'd15) ||

(screen\_X == 9'd265 && screen\_Y == 8'd16) ||

(screen\_X == 9'd265 && screen\_Y == 8'd17) ||

(screen\_X == 9'd265 && screen\_Y == 8'd18) ||

(screen\_X == 9'd265 && screen\_Y == 8'd19) ||

(screen\_X == 9'd265 && screen\_Y == 8'd20) ||

(screen\_X == 9'd265 && screen\_Y == 8'd21) ||

(screen\_X == 9'd265 && screen\_Y == 8'd22) ||

(screen\_X == 9'd265 && screen\_Y == 8'd23) ||

(screen\_X == 9'd265 && screen\_Y == 8'd24) ||

(screen\_X == 9'd262 && screen\_Y == 8'd12) ||

(screen\_X == 9'd263 && screen\_Y == 8'd12) ||

(screen\_X == 9'd264 && screen\_Y == 8'd12) ||

(screen\_X == 9'd262 && screen\_Y == 8'd18) ||

(screen\_X == 9'd263 && screen\_Y == 8'd18) ||

(screen\_X == 9'd264 && screen\_Y == 8'd18) ||

(screen\_X == 9'd261 && screen\_Y == 8'd22) ||

(screen\_X == 9'd261 && screen\_Y == 8'd23) ||

(screen\_X == 9'd261 && screen\_Y == 8'd24) ||

(screen\_X == 9'd262 && screen\_Y == 8'd24) ||

(screen\_X == 9'd263 && screen\_Y == 8'd24) ||

(screen\_X == 9'd264 && screen\_Y == 8'd24)

) begin // g

pixel\_colour = colourful ? ((randNum\_12b[9:7] == 3'b0) ? 3'b111 : randNum\_12b[9:7]) : 3'b111;

end

if ((screen\_X == 9'd267 && screen\_Y == 8'd8) ||

(screen\_X == 9'd268 && screen\_Y == 8'd8) ||

(screen\_X == 9'd268 && screen\_Y == 8'd9) ||

(screen\_X == 9'd268 && screen\_Y == 8'd10) ||

(screen\_X == 9'd268 && screen\_Y == 8'd11) ||

(screen\_X == 9'd268 && screen\_Y == 8'd12) ||

(screen\_X == 9'd268 && screen\_Y == 8'd13) ||

(screen\_X == 9'd268 && screen\_Y == 8'd14) ||

(screen\_X == 9'd268 && screen\_Y == 8'd15) ||

(screen\_X == 9'd268 && screen\_Y == 8'd16) ||

(screen\_X == 9'd268 && screen\_Y == 8'd17) ||

(screen\_X == 9'd268 && screen\_Y == 8'd18) ||

(screen\_X == 9'd268 && screen\_Y == 8'd19) ||

(screen\_X == 9'd269 && screen\_Y == 8'd13) ||

(screen\_X == 9'd270 && screen\_Y == 8'd13) ||

(screen\_X == 9'd271 && screen\_Y == 8'd13) ||

(screen\_X == 9'd272 && screen\_Y == 8'd13) ||

(screen\_X == 9'd272 && screen\_Y == 8'd14) ||

(screen\_X == 9'd272 && screen\_Y == 8'd15) ||

(screen\_X == 9'd272 && screen\_Y == 8'd16) ||

(screen\_X == 9'd272 && screen\_Y == 8'd17) ||

(screen\_X == 9'd272 && screen\_Y == 8'd18)

) begin // h

pixel\_colour = colourful ? ((randNum\_12b[8:6] == 3'b0) ? 3'b111 : randNum\_12b[8:6]) : 3'b111;

end

if ((screen\_X == 9'd276 && screen\_Y == 8'd12) ||

(screen\_X == 9'd277 && screen\_Y == 8'd12) ||

(screen\_X == 9'd278 && screen\_Y == 8'd12) ||

(screen\_X == 9'd279 && screen\_Y == 8'd12) ||

(screen\_X == 9'd280 && screen\_Y == 8'd12) ||

(screen\_X == 9'd281 && screen\_Y == 8'd12) ||

(screen\_X == 9'd276 && screen\_Y == 8'd13) ||

(screen\_X == 9'd276 && screen\_Y == 8'd14) ||

(screen\_X == 9'd276 && screen\_Y == 8'd15) ||

(screen\_X == 9'd276 && screen\_Y == 8'd16) ||

(screen\_X == 9'd276 && screen\_Y == 8'd17) ||

(screen\_X == 9'd276 && screen\_Y == 8'd18) ||

(screen\_X == 9'd276 && screen\_Y == 8'd19) ||

(screen\_X == 9'd277 && screen\_Y == 8'd15) ||

(screen\_X == 9'd278 && screen\_Y == 8'd15) ||

(screen\_X == 9'd279 && screen\_Y == 8'd15) ||

(screen\_X == 9'd280 && screen\_Y == 8'd15) ||

(screen\_X == 9'd281 && screen\_Y == 8'd15) ||

(screen\_X == 9'd282 && screen\_Y == 8'd15) ||

(screen\_X == 9'd277 && screen\_Y == 8'd19) ||

(screen\_X == 9'd278 && screen\_Y == 8'd19) ||

(screen\_X == 9'd279 && screen\_Y == 8'd19) ||

(screen\_X == 9'd280 && screen\_Y == 8'd19) ||

(screen\_X == 9'd281 && screen\_Y == 8'd19) ||

(screen\_X == 9'd282 && screen\_Y == 8'd19) ||

(screen\_X == 9'd281 && screen\_Y == 8'd13) ||

(screen\_X == 9'd282 && screen\_Y == 8'd13) ||

(screen\_X == 9'd282 && screen\_Y == 8'd14)

) begin // e

pixel\_colour = colourful ? ((randNum\_12b[7:5] == 3'b0) ? 3'b111 : randNum\_12b[7:5]) : 3'b111;

end

if ((screen\_X == 9'd286 && screen\_Y == 8'd13) ||

(screen\_X == 9'd287 && screen\_Y == 8'd13) ||

(screen\_X == 9'd288 && screen\_Y == 8'd13) ||

(screen\_X == 9'd289 && screen\_Y == 8'd13) ||

(screen\_X == 9'd290 && screen\_Y == 8'd13) ||

(screen\_X == 9'd291 && screen\_Y == 8'd13) ||

(screen\_X == 9'd292 && screen\_Y == 8'd13) ||

(screen\_X == 9'd293 && screen\_Y == 8'd13) ||

(screen\_X == 9'd286 && screen\_Y == 8'd14) ||

(screen\_X == 9'd286 && screen\_Y == 8'd15) ||

(screen\_X == 9'd286 && screen\_Y == 8'd16) ||

(screen\_X == 9'd286 && screen\_Y == 8'd17) ||

(screen\_X == 9'd287 && screen\_Y == 8'd17) ||

(screen\_X == 9'd288 && screen\_Y == 8'd17) ||

(screen\_X == 9'd289 && screen\_Y == 8'd17) ||

(screen\_X == 9'd290 && screen\_Y == 8'd17) ||

(screen\_X == 9'd291 && screen\_Y == 8'd17) ||

(screen\_X == 9'd292 && screen\_Y == 8'd17) ||

(screen\_X == 9'd293 && screen\_Y == 8'd17) ||

(screen\_X == 9'd293 && screen\_Y == 8'd18) ||

(screen\_X == 9'd293 && screen\_Y == 8'd19) ||

(screen\_X == 9'd287 && screen\_Y == 8'd20) ||

(screen\_X == 9'd288 && screen\_Y == 8'd20) ||

(screen\_X == 9'd289 && screen\_Y == 8'd20) ||

(screen\_X == 9'd290 && screen\_Y == 8'd20) ||

(screen\_X == 9'd291 && screen\_Y == 8'd20) ||

(screen\_X == 9'd292 && screen\_Y == 8'd20) ||

(screen\_X == 9'd293 && screen\_Y == 8'd20)

) begin // s

pixel\_colour = colourful ? ((randNum\_12b[6:4] == 3'b0) ? 3'b111 : randNum\_12b[6:4]) : 3'b111;

end

if ((screen\_X == 9'd295 && screen\_Y == 8'd10) ||

(screen\_X == 9'd296 && screen\_Y == 8'd10) ||

(screen\_X == 9'd297 && screen\_Y == 8'd10) ||

(screen\_X == 9'd298 && screen\_Y == 8'd10) ||

(screen\_X == 9'd299 && screen\_Y == 8'd10) ||

(screen\_X == 9'd300 && screen\_Y == 8'd10) ||

(screen\_X == 9'd301 && screen\_Y == 8'd10) ||

(screen\_X == 9'd302 && screen\_Y == 8'd10) ||

(screen\_X == 9'd303 && screen\_Y == 8'd10) ||

(screen\_X == 9'd304 && screen\_Y == 8'd10) ||

(screen\_X == 9'd305 && screen\_Y == 8'd10) ||

(screen\_X == 9'd300 && screen\_Y == 8'd11) ||

(screen\_X == 9'd300 && screen\_Y == 8'd12) ||

(screen\_X == 9'd300 && screen\_Y == 8'd13) ||

(screen\_X == 9'd300 && screen\_Y == 8'd14) ||

(screen\_X == 9'd300 && screen\_Y == 8'd15) ||

(screen\_X == 9'd300 && screen\_Y == 8'd16) ||

(screen\_X == 9'd300 && screen\_Y == 8'd17) ||

(screen\_X == 9'd300 && screen\_Y == 8'd18) ||

(screen\_X == 9'd300 && screen\_Y == 8'd19) ||

(screen\_X == 9'd300 && screen\_Y == 8'd20) ||

(screen\_X == 9'd300 && screen\_Y == 8'd21)

) begin // t

pixel\_colour = colourful ? ((randNum\_12b[5:3] == 3'b0) ? 3'b111 : randNum\_12b[5:3]) : 3'b111;

end

if ((screen\_X == 9'd258 && screen\_Y == 8'd29) ||

(screen\_X == 9'd256 && screen\_Y == 8'd30) ||

(screen\_X == 9'd257 && screen\_Y == 8'd30) ||

(screen\_X == 9'd255 && screen\_Y == 8'd31) ||

(screen\_X == 9'd255 && screen\_Y == 8'd32) ||

(screen\_X == 9'd255 && screen\_Y == 8'd33) ||

(screen\_X == 9'd255 && screen\_Y == 8'd34) ||

(screen\_X == 9'd256 && screen\_Y == 8'd35) ||

(screen\_X == 9'd256 && screen\_Y == 8'd36) ||

(screen\_X == 9'd256 && screen\_Y == 8'd37) ||

(screen\_X == 9'd257 && screen\_Y == 8'd38) ||

(screen\_X == 9'd257 && screen\_Y == 8'd39) ||

(screen\_X == 9'd258 && screen\_Y == 8'd40) ||

(screen\_X == 9'd258 && screen\_Y == 8'd41) ||

(screen\_X == 9'd259 && screen\_Y == 8'd41) ||

(screen\_X == 9'd259 && screen\_Y == 8'd42) ||

(screen\_X == 9'd260 && screen\_Y == 8'd42) ||

(screen\_X == 9'd254 && screen\_Y == 8'd42) ||

(screen\_X == 9'd255 && screen\_Y == 8'd42) ||

(screen\_X == 9'd256 && screen\_Y == 8'd42) ||

(screen\_X == 9'd257 && screen\_Y == 8'd43) ||

(screen\_X == 9'd258 && screen\_Y == 8'd43) ||

(screen\_X == 9'd259 && screen\_Y == 8'd43) ||

(screen\_X == 9'd260 && screen\_Y == 8'd43) ||

(screen\_X == 9'd261 && screen\_Y == 8'd43) ||

(screen\_X == 9'd261 && screen\_Y == 8'd38) ||

(screen\_X == 9'd261 && screen\_Y == 8'd39) ||

(screen\_X == 9'd261 && screen\_Y == 8'd40) ||

(screen\_X == 9'd261 && screen\_Y == 8'd41) ||

(screen\_X == 9'd261 && screen\_Y == 8'd42)

) begin // arrow

pixel\_colour = colourful ? ((randNum\_12b[4:3] == 3'b0) ? 3'b111 : randNum\_12b[4:3]) : 3'b111;

end

if ((screen\_X == 9'd273 && screen\_Y == 8'd29) ||

(screen\_X == 9'd274 && screen\_Y == 8'd29) ||

(screen\_X == 9'd275 && screen\_Y == 8'd29) ||

(screen\_X == 9'd276 && screen\_Y == 8'd29) ||

(screen\_X == 9'd277 && screen\_Y == 8'd29) ||

(screen\_X == 9'd278 && screen\_Y == 8'd29) ||

(screen\_X == 9'd279 && screen\_Y == 8'd29) ||

(screen\_X == 9'd280 && screen\_Y == 8'd29) ||

(screen\_X == 9'd281 && screen\_Y == 8'd29) ||

(screen\_X == 9'd281 && screen\_Y == 8'd30) ||

(screen\_X == 9'd281 && screen\_Y == 8'd31) ||

(screen\_X == 9'd281 && screen\_Y == 8'd36) ||

(screen\_X == 9'd281 && screen\_Y == 8'd37) ||

(screen\_X == 9'd281 && screen\_Y == 8'd38) ||

(screen\_X == 9'd281 && screen\_Y == 8'd39) ||

(screen\_X == 9'd281 && screen\_Y == 8'd40) ||

(screen\_X == 9'd281 && screen\_Y == 8'd41) ||

(screen\_X == 9'd273 && screen\_Y == 8'd30) ||

(screen\_X == 9'd273 && screen\_Y == 8'd31) ||

(screen\_X == 9'd273 && screen\_Y == 8'd32) ||

(screen\_X == 9'd273 && screen\_Y == 8'd33) ||

(screen\_X == 9'd273 && screen\_Y == 8'd34) ||

(screen\_X == 9'd273 && screen\_Y == 8'd35) ||

(screen\_X == 9'd274 && screen\_Y == 8'd35) ||

(screen\_X == 9'd275 && screen\_Y == 8'd35) ||

(screen\_X == 9'd276 && screen\_Y == 8'd35) ||

(screen\_X == 9'd277 && screen\_Y == 8'd35) ||

(screen\_X == 9'd278 && screen\_Y == 8'd35) ||

(screen\_X == 9'd279 && screen\_Y == 8'd35) ||

(screen\_X == 9'd280 && screen\_Y == 8'd35) ||

(screen\_X == 9'd281 && screen\_Y == 8'd35) ||

(screen\_X == 9'd272 && screen\_Y == 8'd39) ||

(screen\_X == 9'd272 && screen\_Y == 8'd40) ||

(screen\_X == 9'd272 && screen\_Y == 8'd41) ||

(screen\_X == 9'd273 && screen\_Y == 8'd41) ||

(screen\_X == 9'd274 && screen\_Y == 8'd41) ||

(screen\_X == 9'd275 && screen\_Y == 8'd41) ||

(screen\_X == 9'd276 && screen\_Y == 8'd41) ||

(screen\_X == 9'd277 && screen\_Y == 8'd41) ||

(screen\_X == 9'd278 && screen\_Y == 8'd41) ||

(screen\_X == 9'd279 && screen\_Y == 8'd41) ||

(screen\_X == 9'd280 && screen\_Y == 8'd41)

) begin // S

pixel\_colour = colourful ? ((randNum\_12b[3:1] == 3'b0) ? 3'b111 : randNum\_12b[3:1]) : 3'b111;

end

if ((screen\_X == 9'd283 && screen\_Y == 8'd32) ||

(screen\_X == 9'd284 && screen\_Y == 8'd32) ||

(screen\_X == 9'd285 && screen\_Y == 8'd32) ||

(screen\_X == 9'd286 && screen\_Y == 8'd32) ||

(screen\_X == 9'd287 && screen\_Y == 8'd32) ||

(screen\_X == 9'd288 && screen\_Y == 8'd32) ||

(screen\_X == 9'd288 && screen\_Y == 8'd33) ||

(screen\_X == 9'd283 && screen\_Y == 8'd33) ||

(screen\_X == 9'd283 && screen\_Y == 8'd34) ||

(screen\_X == 9'd283 && screen\_Y == 8'd35) ||

(screen\_X == 9'd283 && screen\_Y == 8'd36) ||

(screen\_X == 9'd283 && screen\_Y == 8'd37) ||

(screen\_X == 9'd283 && screen\_Y == 8'd38) ||

(screen\_X == 9'd283 && screen\_Y == 8'd39) ||

(screen\_X == 9'd284 && screen\_Y == 8'd39) ||

(screen\_X == 9'd285 && screen\_Y == 8'd39) ||

(screen\_X == 9'd286 && screen\_Y == 8'd39) ||

(screen\_X == 9'd287 && screen\_Y == 8'd39) ||

(screen\_X == 9'd288 && screen\_Y == 8'd39)

) begin // c

pixel\_colour = colourful ? ((randNum\_12b[2:0] == 3'b0) ? 3'b111 : randNum\_12b[2:0]) : 3'b111;

end

if ((screen\_X == 9'd291 && screen\_Y == 8'd32) ||

(screen\_X == 9'd292 && screen\_Y == 8'd32) ||

(screen\_X == 9'd293 && screen\_Y == 8'd32) ||

(screen\_X == 9'd294 && screen\_Y == 8'd32) ||

(screen\_X == 9'd295 && screen\_Y == 8'd32) ||

(screen\_X == 9'd296 && screen\_Y == 8'd32) ||

(screen\_X == 9'd297 && screen\_Y == 8'd32) ||

(screen\_X == 9'd292 && screen\_Y == 8'd39) ||

(screen\_X == 9'd293 && screen\_Y == 8'd39) ||

(screen\_X == 9'd294 && screen\_Y == 8'd39) ||

(screen\_X == 9'd295 && screen\_Y == 8'd39) ||

(screen\_X == 9'd296 && screen\_Y == 8'd39) ||

(screen\_X == 9'd291 && screen\_Y == 8'd33) ||

(screen\_X == 9'd291 && screen\_Y == 8'd34) ||

(screen\_X == 9'd291 && screen\_Y == 8'd35) ||

(screen\_X == 9'd291 && screen\_Y == 8'd36) ||

(screen\_X == 9'd291 && screen\_Y == 8'd37) ||

(screen\_X == 9'd291 && screen\_Y == 8'd38) ||

(screen\_X == 9'd291 && screen\_Y == 8'd39) ||

(screen\_X == 9'd297 && screen\_Y == 8'd33) ||

(screen\_X == 9'd297 && screen\_Y == 8'd34) ||

(screen\_X == 9'd297 && screen\_Y == 8'd35) ||

(screen\_X == 9'd297 && screen\_Y == 8'd36) ||

(screen\_X == 9'd297 && screen\_Y == 8'd37) ||

(screen\_X == 9'd297 && screen\_Y == 8'd38) ||

(screen\_X == 9'd297 && screen\_Y == 8'd39) ||

(screen\_X == 9'd297 && screen\_Y == 8'd40)

) begin // o

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[2:0]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[2:0])) : 3'b111;

end

if ((screen\_X == 9'd300 && screen\_Y == 8'd33) ||

(screen\_X == 9'd300 && screen\_Y == 8'd34) ||

(screen\_X == 9'd300 && screen\_Y == 8'd35) ||

(screen\_X == 9'd300 && screen\_Y == 8'd36) ||

(screen\_X == 9'd300 && screen\_Y == 8'd37) ||

(screen\_X == 9'd300 && screen\_Y == 8'd38) ||

(screen\_X == 9'd300 && screen\_Y == 8'd39) ||

(screen\_X == 9'd301 && screen\_Y == 8'd34) ||

(screen\_X == 9'd302 && screen\_Y == 8'd33) ||

(screen\_X == 9'd303 && screen\_Y == 8'd33) ||

(screen\_X == 9'd304 && screen\_Y == 8'd33) ||

(screen\_X == 9'd305 && screen\_Y == 8'd33) ||

(screen\_X == 9'd306 && screen\_Y == 8'd33)

) begin // r

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[2:0]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[2:0])) : 3'b111;

end

if ((screen\_X == 9'd310 && screen\_Y == 8'd32) ||

(screen\_X == 9'd311 && screen\_Y == 8'd32) ||

(screen\_X == 9'd312 && screen\_Y == 8'd32) ||

(screen\_X == 9'd313 && screen\_Y == 8'd32) ||

(screen\_X == 9'd314 && screen\_Y == 8'd33) ||

(screen\_X == 9'd314 && screen\_Y == 8'd34) ||

(screen\_X == 9'd315 && screen\_Y == 8'd34) ||

(screen\_X == 9'd315 && screen\_Y == 8'd35) ||

(screen\_X == 9'd315 && screen\_Y == 8'd36) ||

(screen\_X == 9'd310 && screen\_Y == 8'd37) ||

(screen\_X == 9'd311 && screen\_Y == 8'd37) ||

(screen\_X == 9'd312 && screen\_Y == 8'd37) ||

(screen\_X == 9'd313 && screen\_Y == 8'd37) ||

(screen\_X == 9'd314 && screen\_Y == 8'd37) ||

(screen\_X == 9'd315 && screen\_Y == 8'd37) ||

(screen\_X == 9'd311 && screen\_Y == 8'd41) ||

(screen\_X == 9'd312 && screen\_Y == 8'd41) ||

(screen\_X == 9'd313 && screen\_Y == 8'd41) ||

(screen\_X == 9'd314 && screen\_Y == 8'd41) ||

(screen\_X == 9'd315 && screen\_Y == 8'd41) ||

(screen\_X == 9'd310 && screen\_Y == 8'd40) ||

(screen\_X == 9'd309 && screen\_Y == 8'd33) ||

(screen\_X == 9'd309 && screen\_Y == 8'd34) ||

(screen\_X == 9'd309 && screen\_Y == 8'd35) ||

(screen\_X == 9'd309 && screen\_Y == 8'd36) ||

(screen\_X == 9'd309 && screen\_Y == 8'd37) ||

(screen\_X == 9'd309 && screen\_Y == 8'd38) ||

(screen\_X == 9'd309 && screen\_Y == 8'd39)

) begin // e

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[3:1]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[3:1])) : 3'b111;

end

if ((screen\_X == 9'd251 && screen\_Y == 8'd50) ||

(screen\_X == 9'd252 && screen\_Y == 8'd50) ||

(screen\_X == 9'd253 && screen\_Y == 8'd50) ||

(screen\_X == 9'd254 && screen\_Y == 8'd50) ||

(screen\_X == 9'd255 && screen\_Y == 8'd50) ||

(screen\_X == 9'd256 && screen\_Y == 8'd50) ||

(screen\_X == 9'd257 && screen\_Y == 8'd50) ||

(screen\_X == 9'd258 && screen\_Y == 8'd50) ||

(screen\_X == 9'd259 && screen\_Y == 8'd50) ||

(screen\_X == 9'd260 && screen\_Y == 8'd50) ||

(screen\_X == 9'd261 && screen\_Y == 8'd50) ||

(screen\_X == 9'd262 && screen\_Y == 8'd50) ||

(screen\_X == 9'd263 && screen\_Y == 8'd50) ||

(screen\_X == 9'd264 && screen\_Y == 8'd50) ||

(screen\_X == 9'd265 && screen\_Y == 8'd50) ||

(screen\_X == 9'd266 && screen\_Y == 8'd50) ||

(screen\_X == 9'd267 && screen\_Y == 8'd50) ||

(screen\_X == 9'd268 && screen\_Y == 8'd50) ||

(screen\_X == 9'd269 && screen\_Y == 8'd50) ||

(screen\_X == 9'd270 && screen\_Y == 8'd50) ||

(screen\_X == 9'd271 && screen\_Y == 8'd50) ||

(screen\_X == 9'd272 && screen\_Y == 8'd50) ||

(screen\_X == 9'd273 && screen\_Y == 8'd50) ||

(screen\_X == 9'd274 && screen\_Y == 8'd50) ||

(screen\_X == 9'd275 && screen\_Y == 8'd50) ||

(screen\_X == 9'd276 && screen\_Y == 8'd50) ||

(screen\_X == 9'd277 && screen\_Y == 8'd50) ||

(screen\_X == 9'd278 && screen\_Y == 8'd50) ||

(screen\_X == 9'd279 && screen\_Y == 8'd50) ||

(screen\_X == 9'd280 && screen\_Y == 8'd50) ||

(screen\_X == 9'd281 && screen\_Y == 8'd50) ||

(screen\_X == 9'd282 && screen\_Y == 8'd50) ||

(screen\_X == 9'd283 && screen\_Y == 8'd50) ||

(screen\_X == 9'd284 && screen\_Y == 8'd50) ||

(screen\_X == 9'd285 && screen\_Y == 8'd50) ||

(screen\_X == 9'd286 && screen\_Y == 8'd50) ||

(screen\_X == 9'd287 && screen\_Y == 8'd50) ||

(screen\_X == 9'd288 && screen\_Y == 8'd50) ||

(screen\_X == 9'd289 && screen\_Y == 8'd50) ||

(screen\_X == 9'd290 && screen\_Y == 8'd50) ||

(screen\_X == 9'd291 && screen\_Y == 8'd50) ||

(screen\_X == 9'd292 && screen\_Y == 8'd50) ||

(screen\_X == 9'd293 && screen\_Y == 8'd50) ||

(screen\_X == 9'd294 && screen\_Y == 8'd50) ||

(screen\_X == 9'd295 && screen\_Y == 8'd50) ||

(screen\_X == 9'd296 && screen\_Y == 8'd50) ||

(screen\_X == 9'd297 && screen\_Y == 8'd50) ||

(screen\_X == 9'd298 && screen\_Y == 8'd50) ||

(screen\_X == 9'd299 && screen\_Y == 8'd50) ||

(screen\_X == 9'd300 && screen\_Y == 8'd50) ||

(screen\_X == 9'd301 && screen\_Y == 8'd50) ||

(screen\_X == 9'd302 && screen\_Y == 8'd50) ||

(screen\_X == 9'd303 && screen\_Y == 8'd50) ||

(screen\_X == 9'd304 && screen\_Y == 8'd50) ||

(screen\_X == 9'd305 && screen\_Y == 8'd50) ||

(screen\_X == 9'd306 && screen\_Y == 8'd50) ||

(screen\_X == 9'd307 && screen\_Y == 8'd50) ||

(screen\_X == 9'd308 && screen\_Y == 8'd50) ||

(screen\_X == 9'd309 && screen\_Y == 8'd50) ||

(screen\_X == 9'd251 && screen\_Y == 8'd108) ||

(screen\_X == 9'd252 && screen\_Y == 8'd108) ||

(screen\_X == 9'd253 && screen\_Y == 8'd108) ||

(screen\_X == 9'd254 && screen\_Y == 8'd108) ||

(screen\_X == 9'd255 && screen\_Y == 8'd108) ||

(screen\_X == 9'd256 && screen\_Y == 8'd108) ||

(screen\_X == 9'd257 && screen\_Y == 8'd108) ||

(screen\_X == 9'd258 && screen\_Y == 8'd108) ||

(screen\_X == 9'd259 && screen\_Y == 8'd108) ||

(screen\_X == 9'd260 && screen\_Y == 8'd108) ||

(screen\_X == 9'd261 && screen\_Y == 8'd108) ||

(screen\_X == 9'd262 && screen\_Y == 8'd108) ||

(screen\_X == 9'd263 && screen\_Y == 8'd108) ||

(screen\_X == 9'd264 && screen\_Y == 8'd108) ||

(screen\_X == 9'd265 && screen\_Y == 8'd108) ||

(screen\_X == 9'd266 && screen\_Y == 8'd108) ||

(screen\_X == 9'd267 && screen\_Y == 8'd108) ||

(screen\_X == 9'd268 && screen\_Y == 8'd108) ||

(screen\_X == 9'd269 && screen\_Y == 8'd108) ||

(screen\_X == 9'd270 && screen\_Y == 8'd108) ||

(screen\_X == 9'd271 && screen\_Y == 8'd108) ||

(screen\_X == 9'd272 && screen\_Y == 8'd108) ||

(screen\_X == 9'd273 && screen\_Y == 8'd108) ||

(screen\_X == 9'd274 && screen\_Y == 8'd108) ||

(screen\_X == 9'd275 && screen\_Y == 8'd108) ||

(screen\_X == 9'd276 && screen\_Y == 8'd108) ||

(screen\_X == 9'd277 && screen\_Y == 8'd108) ||

(screen\_X == 9'd278 && screen\_Y == 8'd108) ||

(screen\_X == 9'd279 && screen\_Y == 8'd108) ||

(screen\_X == 9'd280 && screen\_Y == 8'd108) ||

(screen\_X == 9'd281 && screen\_Y == 8'd108) ||

(screen\_X == 9'd282 && screen\_Y == 8'd108) ||

(screen\_X == 9'd283 && screen\_Y == 8'd108) ||

(screen\_X == 9'd284 && screen\_Y == 8'd108) ||

(screen\_X == 9'd285 && screen\_Y == 8'd108) ||

(screen\_X == 9'd286 && screen\_Y == 8'd108) ||

(screen\_X == 9'd287 && screen\_Y == 8'd108) ||

(screen\_X == 9'd288 && screen\_Y == 8'd108) ||

(screen\_X == 9'd289 && screen\_Y == 8'd108) ||

(screen\_X == 9'd290 && screen\_Y == 8'd108) ||

(screen\_X == 9'd291 && screen\_Y == 8'd108) ||

(screen\_X == 9'd292 && screen\_Y == 8'd108) ||

(screen\_X == 9'd293 && screen\_Y == 8'd108) ||

(screen\_X == 9'd294 && screen\_Y == 8'd108) ||

(screen\_X == 9'd295 && screen\_Y == 8'd108) ||

(screen\_X == 9'd296 && screen\_Y == 8'd108) ||

(screen\_X == 9'd297 && screen\_Y == 8'd108) ||

(screen\_X == 9'd298 && screen\_Y == 8'd108) ||

(screen\_X == 9'd299 && screen\_Y == 8'd108) ||

(screen\_X == 9'd300 && screen\_Y == 8'd108) ||

(screen\_X == 9'd301 && screen\_Y == 8'd108) ||

(screen\_X == 9'd302 && screen\_Y == 8'd108) ||

(screen\_X == 9'd303 && screen\_Y == 8'd108) ||

(screen\_X == 9'd304 && screen\_Y == 8'd108) ||

(screen\_X == 9'd305 && screen\_Y == 8'd108) ||

(screen\_X == 9'd306 && screen\_Y == 8'd108) ||

(screen\_X == 9'd307 && screen\_Y == 8'd108) ||

(screen\_X == 9'd308 && screen\_Y == 8'd108) ||

(screen\_X == 9'd309 && screen\_Y == 8'd108) ||

(screen\_X == 9'd251 && screen\_Y == 8'd51) ||

(screen\_X == 9'd251 && screen\_Y == 8'd52) ||

(screen\_X == 9'd251 && screen\_Y == 8'd53) ||

(screen\_X == 9'd251 && screen\_Y == 8'd54) ||

(screen\_X == 9'd251 && screen\_Y == 8'd55) ||

(screen\_X == 9'd251 && screen\_Y == 8'd56) ||

(screen\_X == 9'd251 && screen\_Y == 8'd57) ||

(screen\_X == 9'd251 && screen\_Y == 8'd58) ||

(screen\_X == 9'd251 && screen\_Y == 8'd59) ||

(screen\_X == 9'd251 && screen\_Y == 8'd60) ||

(screen\_X == 9'd251 && screen\_Y == 8'd61) ||

(screen\_X == 9'd251 && screen\_Y == 8'd62) ||

(screen\_X == 9'd251 && screen\_Y == 8'd63) ||

(screen\_X == 9'd251 && screen\_Y == 8'd64) ||

(screen\_X == 9'd251 && screen\_Y == 8'd65) ||

(screen\_X == 9'd251 && screen\_Y == 8'd66) ||

(screen\_X == 9'd251 && screen\_Y == 8'd67) ||

(screen\_X == 9'd251 && screen\_Y == 8'd68) ||

(screen\_X == 9'd251 && screen\_Y == 8'd69) ||

(screen\_X == 9'd251 && screen\_Y == 8'd70) ||

(screen\_X == 9'd251 && screen\_Y == 8'd71) ||

(screen\_X == 9'd251 && screen\_Y == 8'd72) ||

(screen\_X == 9'd251 && screen\_Y == 8'd73) ||

(screen\_X == 9'd251 && screen\_Y == 8'd74) ||

(screen\_X == 9'd251 && screen\_Y == 8'd75) ||

(screen\_X == 9'd251 && screen\_Y == 8'd76) ||

(screen\_X == 9'd251 && screen\_Y == 8'd77) ||

(screen\_X == 9'd251 && screen\_Y == 8'd78) ||

(screen\_X == 9'd251 && screen\_Y == 8'd79) ||

(screen\_X == 9'd251 && screen\_Y == 8'd80) ||

(screen\_X == 9'd251 && screen\_Y == 8'd81) ||

(screen\_X == 9'd251 && screen\_Y == 8'd82) ||

(screen\_X == 9'd251 && screen\_Y == 8'd83) ||

(screen\_X == 9'd251 && screen\_Y == 8'd84) ||

(screen\_X == 9'd251 && screen\_Y == 8'd85) ||

(screen\_X == 9'd251 && screen\_Y == 8'd86) ||

(screen\_X == 9'd251 && screen\_Y == 8'd87) ||

(screen\_X == 9'd251 && screen\_Y == 8'd88) ||

(screen\_X == 9'd251 && screen\_Y == 8'd89) ||

(screen\_X == 9'd251 && screen\_Y == 8'd90) ||

(screen\_X == 9'd251 && screen\_Y == 8'd91) ||

(screen\_X == 9'd251 && screen\_Y == 8'd92) ||

(screen\_X == 9'd251 && screen\_Y == 8'd93) ||

(screen\_X == 9'd251 && screen\_Y == 8'd94) ||

(screen\_X == 9'd251 && screen\_Y == 8'd95) ||

(screen\_X == 9'd251 && screen\_Y == 8'd96) ||

(screen\_X == 9'd251 && screen\_Y == 8'd97) ||

(screen\_X == 9'd251 && screen\_Y == 8'd98) ||

(screen\_X == 9'd251 && screen\_Y == 8'd99) ||

(screen\_X == 9'd251 && screen\_Y == 8'd100) ||

(screen\_X == 9'd251 && screen\_Y == 8'd101) ||

(screen\_X == 9'd251 && screen\_Y == 8'd102) ||

(screen\_X == 9'd251 && screen\_Y == 8'd103) ||

(screen\_X == 9'd251 && screen\_Y == 8'd104) ||

(screen\_X == 9'd251 && screen\_Y == 8'd105) ||

(screen\_X == 9'd251 && screen\_Y == 8'd106) ||

(screen\_X == 9'd251 && screen\_Y == 8'd107) ||

(screen\_X == 9'd309 && screen\_Y == 8'd51) ||

(screen\_X == 9'd309 && screen\_Y == 8'd52) ||

(screen\_X == 9'd309 && screen\_Y == 8'd53) ||

(screen\_X == 9'd309 && screen\_Y == 8'd54) ||

(screen\_X == 9'd309 && screen\_Y == 8'd55) ||

(screen\_X == 9'd309 && screen\_Y == 8'd56) ||

(screen\_X == 9'd309 && screen\_Y == 8'd57) ||

(screen\_X == 9'd309 && screen\_Y == 8'd58) ||

(screen\_X == 9'd309 && screen\_Y == 8'd59) ||

(screen\_X == 9'd309 && screen\_Y == 8'd60) ||

(screen\_X == 9'd309 && screen\_Y == 8'd61) ||

(screen\_X == 9'd309 && screen\_Y == 8'd62) ||

(screen\_X == 9'd309 && screen\_Y == 8'd63) ||

(screen\_X == 9'd309 && screen\_Y == 8'd64) ||

(screen\_X == 9'd309 && screen\_Y == 8'd65) ||

(screen\_X == 9'd309 && screen\_Y == 8'd66) ||

(screen\_X == 9'd309 && screen\_Y == 8'd67) ||

(screen\_X == 9'd309 && screen\_Y == 8'd68) ||

(screen\_X == 9'd309 && screen\_Y == 8'd69) ||

(screen\_X == 9'd309 && screen\_Y == 8'd70) ||

(screen\_X == 9'd309 && screen\_Y == 8'd71) ||

(screen\_X == 9'd309 && screen\_Y == 8'd72) ||

(screen\_X == 9'd309 && screen\_Y == 8'd73) ||

(screen\_X == 9'd309 && screen\_Y == 8'd74) ||

(screen\_X == 9'd309 && screen\_Y == 8'd75) ||

(screen\_X == 9'd309 && screen\_Y == 8'd76) ||

(screen\_X == 9'd309 && screen\_Y == 8'd77) ||

(screen\_X == 9'd309 && screen\_Y == 8'd78) ||

(screen\_X == 9'd309 && screen\_Y == 8'd79) ||

(screen\_X == 9'd309 && screen\_Y == 8'd80) ||

(screen\_X == 9'd309 && screen\_Y == 8'd81) ||

(screen\_X == 9'd309 && screen\_Y == 8'd82) ||

(screen\_X == 9'd309 && screen\_Y == 8'd83) ||

(screen\_X == 9'd309 && screen\_Y == 8'd84) ||

(screen\_X == 9'd309 && screen\_Y == 8'd85) ||

(screen\_X == 9'd309 && screen\_Y == 8'd86) ||

(screen\_X == 9'd309 && screen\_Y == 8'd87) ||

(screen\_X == 9'd309 && screen\_Y == 8'd88) ||

(screen\_X == 9'd309 && screen\_Y == 8'd89) ||

(screen\_X == 9'd309 && screen\_Y == 8'd90) ||

(screen\_X == 9'd309 && screen\_Y == 8'd91) ||

(screen\_X == 9'd309 && screen\_Y == 8'd92) ||

(screen\_X == 9'd309 && screen\_Y == 8'd93) ||

(screen\_X == 9'd309 && screen\_Y == 8'd94) ||

(screen\_X == 9'd309 && screen\_Y == 8'd95) ||

(screen\_X == 9'd309 && screen\_Y == 8'd96) ||

(screen\_X == 9'd309 && screen\_Y == 8'd97) ||

(screen\_X == 9'd309 && screen\_Y == 8'd98) ||

(screen\_X == 9'd309 && screen\_Y == 8'd99) ||

(screen\_X == 9'd309 && screen\_Y == 8'd100) ||

(screen\_X == 9'd309 && screen\_Y == 8'd101) ||

(screen\_X == 9'd309 && screen\_Y == 8'd102) ||

(screen\_X == 9'd309 && screen\_Y == 8'd103) ||

(screen\_X == 9'd309 && screen\_Y == 8'd104) ||

(screen\_X == 9'd309 && screen\_Y == 8'd105) ||

(screen\_X == 9'd309 && screen\_Y == 8'd106) ||

(screen\_X == 9'd309 && screen\_Y == 8'd107)

) begin // box border

pixel\_colour = colourful ? (((randNum\_12b[6:4] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[6:4] ^ randNum\_12b[4:2])) : 3'b111;

end

if (screen\_X >= 9'd252 && screen\_X <= 9'd308 && screen\_Y >= 8'd50 && screen\_Y <= 8'd106) begin

effective\_X = screen\_X - 9'd252;

effective\_Y = screen\_Y - 8'd51;

if (highscore == 12'd0) begin

end

if (highscore == 12'd2) begin

if((effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[7:5] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[7:5] ^ randNum\_12b[4:2])) : 3'b111;

end

end

if (highscore == 12'd4) begin

if((effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) ||

(effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) ||

(effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) ||

(effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) ||

(effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) ||

(effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) ||

(effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) ||

(effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) ||

(effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[4:2])) : 3'b111;

end

end

if (highscore == 12'd8) begin

if((effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[3:1]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[3:1])) : 3'b111;

end

end

if (highscore == 12'd16) begin

if((effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38)||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38)||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38)||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38)||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38)||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38)||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38)||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38)||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38)||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38)||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38)||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38)||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[6:4] ^ randNum\_12b[7:5]) == 3'b0) ? 3'b111 : (randNum\_12b[6:4] ^ randNum\_12b[7:5])) : 3'b111;

end

end

if (highscore == 12'd32) begin

if((effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) || (effective\_X == 9'd29 && effective\_Y == 8'd37) || (effective\_X == 9'd29 && effective\_Y == 8'd38) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) || (effective\_X == 9'd30 && effective\_Y == 8'd37) || (effective\_X == 9'd30 && effective\_Y == 8'd38) ||

(effective\_X == 9'd31 && effective\_Y == 8'd18) || (effective\_X == 9'd31 && effective\_Y == 8'd19) || (effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) || (effective\_X == 9'd31 && effective\_Y == 8'd37) || (effective\_X == 9'd31 && effective\_Y == 8'd38) ||

(effective\_X == 9'd32 && effective\_Y == 8'd18) || (effective\_X == 9'd32 && effective\_Y == 8'd19) || (effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) || (effective\_X == 9'd32 && effective\_Y == 8'd37) || (effective\_X == 9'd32 && effective\_Y == 8'd38) ||

(effective\_X == 9'd33 && effective\_Y == 8'd18) || (effective\_X == 9'd33 && effective\_Y == 8'd19) || (effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) || (effective\_X == 9'd33 && effective\_Y == 8'd37) || (effective\_X == 9'd33 && effective\_Y == 8'd38) ||

(effective\_X == 9'd34 && effective\_Y == 8'd18) || (effective\_X == 9'd34 && effective\_Y == 8'd19) || (effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) || (effective\_X == 9'd34 && effective\_Y == 8'd37) || (effective\_X == 9'd34 && effective\_Y == 8'd38) ||

(effective\_X == 9'd35 && effective\_Y == 8'd18) || (effective\_X == 9'd35 && effective\_Y == 8'd19) || (effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) || (effective\_X == 9'd35 && effective\_Y == 8'd37) || (effective\_X == 9'd35 && effective\_Y == 8'd38) ||

(effective\_X == 9'd36 && effective\_Y == 8'd18) || (effective\_X == 9'd36 && effective\_Y == 8'd19) || (effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) || (effective\_X == 9'd36 && effective\_Y == 8'd37) || (effective\_X == 9'd36 && effective\_Y == 8'd38) ||

(effective\_X == 9'd37 && effective\_Y == 8'd18) || (effective\_X == 9'd37 && effective\_Y == 8'd19) || (effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) || (effective\_X == 9'd37 && effective\_Y == 8'd37) || (effective\_X == 9'd37 && effective\_Y == 8'd38) ||

(effective\_X == 9'd38 && effective\_Y == 8'd18) || (effective\_X == 9'd38 && effective\_Y == 8'd19) || (effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) || (effective\_X == 9'd38 && effective\_Y == 8'd37) || (effective\_X == 9'd38 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[4:2] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[4:2] ^ randNum\_12b[4:2])) : 3'b111;

end

end

if (highscore == 12'd64) begin

if((effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd20) || (effective\_X == 9'd29 && effective\_Y == 8'd21) || (effective\_X == 9'd29 && effective\_Y == 8'd22) || (effective\_X == 9'd29 && effective\_Y == 8'd23) || (effective\_X == 9'd29 && effective\_Y == 8'd24) || (effective\_X == 9'd29 && effective\_Y == 8'd25) || (effective\_X == 9'd29 && effective\_Y == 8'd26) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) || (effective\_X == 9'd29 && effective\_Y == 8'd29) || (effective\_X == 9'd29 && effective\_Y == 8'd30) || (effective\_X == 9'd29 && effective\_Y == 8'd31) || (effective\_X == 9'd29 && effective\_Y == 8'd32) || (effective\_X == 9'd29 && effective\_Y == 8'd33) || (effective\_X == 9'd29 && effective\_Y == 8'd34) || (effective\_X == 9'd29 && effective\_Y == 8'd35) || (effective\_X == 9'd29 && effective\_Y == 8'd36) || (effective\_X == 9'd29 && effective\_Y == 8'd37) || (effective\_X == 9'd29 && effective\_Y == 8'd38) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd20) || (effective\_X == 9'd30 && effective\_Y == 8'd21) || (effective\_X == 9'd30 && effective\_Y == 8'd22) || (effective\_X == 9'd30 && effective\_Y == 8'd23) || (effective\_X == 9'd30 && effective\_Y == 8'd24) || (effective\_X == 9'd30 && effective\_Y == 8'd25) || (effective\_X == 9'd30 && effective\_Y == 8'd26) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) || (effective\_X == 9'd30 && effective\_Y == 8'd29) || (effective\_X == 9'd30 && effective\_Y == 8'd30) || (effective\_X == 9'd30 && effective\_Y == 8'd31) || (effective\_X == 9'd30 && effective\_Y == 8'd32) || (effective\_X == 9'd30 && effective\_Y == 8'd33) || (effective\_X == 9'd30 && effective\_Y == 8'd34) || (effective\_X == 9'd30 && effective\_Y == 8'd35) || (effective\_X == 9'd30 && effective\_Y == 8'd36) || (effective\_X == 9'd30 && effective\_Y == 8'd37) || (effective\_X == 9'd30 && effective\_Y == 8'd38) ||

(effective\_X == 9'd31 && effective\_Y == 8'd18) || (effective\_X == 9'd31 && effective\_Y == 8'd19) || (effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) || (effective\_X == 9'd31 && effective\_Y == 8'd37) || (effective\_X == 9'd31 && effective\_Y == 8'd38) ||

(effective\_X == 9'd32 && effective\_Y == 8'd18) || (effective\_X == 9'd32 && effective\_Y == 8'd19) || (effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) || (effective\_X == 9'd32 && effective\_Y == 8'd37) || (effective\_X == 9'd32 && effective\_Y == 8'd38) ||

(effective\_X == 9'd33 && effective\_Y == 8'd18) || (effective\_X == 9'd33 && effective\_Y == 8'd19) || (effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) || (effective\_X == 9'd33 && effective\_Y == 8'd37) || (effective\_X == 9'd33 && effective\_Y == 8'd38) ||

(effective\_X == 9'd34 && effective\_Y == 8'd18) || (effective\_X == 9'd34 && effective\_Y == 8'd19) || (effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) || (effective\_X == 9'd34 && effective\_Y == 8'd37) || (effective\_X == 9'd34 && effective\_Y == 8'd38) ||

(effective\_X == 9'd35 && effective\_Y == 8'd18) || (effective\_X == 9'd35 && effective\_Y == 8'd19) || (effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) || (effective\_X == 9'd35 && effective\_Y == 8'd37) || (effective\_X == 9'd35 && effective\_Y == 8'd38) ||

(effective\_X == 9'd36 && effective\_Y == 8'd18) || (effective\_X == 9'd36 && effective\_Y == 8'd19) || (effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) || (effective\_X == 9'd36 && effective\_Y == 8'd37) || (effective\_X == 9'd36 && effective\_Y == 8'd38) ||

(effective\_X == 9'd37 && effective\_Y == 8'd18) || (effective\_X == 9'd37 && effective\_Y == 8'd19) || (effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) || (effective\_X == 9'd37 && effective\_Y == 8'd37) || (effective\_X == 9'd37 && effective\_Y == 8'd38) ||

(effective\_X == 9'd38 && effective\_Y == 8'd18) || (effective\_X == 9'd38 && effective\_Y == 8'd19) || (effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) || (effective\_X == 9'd38 && effective\_Y == 8'd37) || (effective\_X == 9'd38 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) ||

(effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) ||

(effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) ||

(effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) ||

(effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) ||

(effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) ||

(effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) ||

(effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) ||

(effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[7:5] ^ randNum\_12b[8:6]) == 3'b0) ? 3'b111 : (randNum\_12b[7:5] ^ randNum\_12b[8:6])) : 3'b111;

end

end

if (highscore == 12'd128) begin

if((effective\_X == 9'd25 && effective\_Y == 8'd18) || (effective\_X == 9'd25 && effective\_Y == 8'd19) || (effective\_X == 9'd25 && effective\_Y == 8'd20) || (effective\_X == 9'd25 && effective\_Y == 8'd21) || (effective\_X == 9'd25 && effective\_Y == 8'd22) || (effective\_X == 9'd25 && effective\_Y == 8'd23) || (effective\_X == 9'd25 && effective\_Y == 8'd24) || (effective\_X == 9'd25 && effective\_Y == 8'd25) || (effective\_X == 9'd25 && effective\_Y == 8'd26) || (effective\_X == 9'd25 && effective\_Y == 8'd27) || (effective\_X == 9'd25 && effective\_Y == 8'd28) || (effective\_X == 9'd25 && effective\_Y == 8'd29) || (effective\_X == 9'd25 && effective\_Y == 8'd30) || (effective\_X == 9'd25 && effective\_Y == 8'd31) || (effective\_X == 9'd25 && effective\_Y == 8'd32) || (effective\_X == 9'd25 && effective\_Y == 8'd33) || (effective\_X == 9'd25 && effective\_Y == 8'd34) || (effective\_X == 9'd25 && effective\_Y == 8'd35) || (effective\_X == 9'd25 && effective\_Y == 8'd36) || (effective\_X == 9'd25 && effective\_Y == 8'd37) || (effective\_X == 9'd25 && effective\_Y == 8'd38) ||

(effective\_X == 9'd26 && effective\_Y == 8'd18) || (effective\_X == 9'd26 && effective\_Y == 8'd19) || (effective\_X == 9'd26 && effective\_Y == 8'd20) || (effective\_X == 9'd26 && effective\_Y == 8'd21) || (effective\_X == 9'd26 && effective\_Y == 8'd22) || (effective\_X == 9'd26 && effective\_Y == 8'd23) || (effective\_X == 9'd26 && effective\_Y == 8'd24) || (effective\_X == 9'd26 && effective\_Y == 8'd25) || (effective\_X == 9'd26 && effective\_Y == 8'd26) || (effective\_X == 9'd26 && effective\_Y == 8'd27) || (effective\_X == 9'd26 && effective\_Y == 8'd28) || (effective\_X == 9'd26 && effective\_Y == 8'd29) || (effective\_X == 9'd26 && effective\_Y == 8'd30) || (effective\_X == 9'd26 && effective\_Y == 8'd31) || (effective\_X == 9'd26 && effective\_Y == 8'd32) || (effective\_X == 9'd26 && effective\_Y == 8'd33) || (effective\_X == 9'd26 && effective\_Y == 8'd34) || (effective\_X == 9'd26 && effective\_Y == 8'd35) || (effective\_X == 9'd26 && effective\_Y == 8'd36) || (effective\_X == 9'd26 && effective\_Y == 8'd37) || (effective\_X == 9'd26 && effective\_Y == 8'd38) ||

(effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) || (effective\_X == 9'd29 && effective\_Y == 8'd29) || (effective\_X == 9'd29 && effective\_Y == 8'd30) || (effective\_X == 9'd29 && effective\_Y == 8'd31) || (effective\_X == 9'd29 && effective\_Y == 8'd32) || (effective\_X == 9'd29 && effective\_Y == 8'd33) || (effective\_X == 9'd29 && effective\_Y == 8'd34) || (effective\_X == 9'd29 && effective\_Y == 8'd35) || (effective\_X == 9'd29 && effective\_Y == 8'd36) || (effective\_X == 9'd29 && effective\_Y == 8'd37) || (effective\_X == 9'd29 && effective\_Y == 8'd38) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) || (effective\_X == 9'd30 && effective\_Y == 8'd29) || (effective\_X == 9'd30 && effective\_Y == 8'd30) || (effective\_X == 9'd30 && effective\_Y == 8'd31) || (effective\_X == 9'd30 && effective\_Y == 8'd32) || (effective\_X == 9'd30 && effective\_Y == 8'd33) || (effective\_X == 9'd30 && effective\_Y == 8'd34) || (effective\_X == 9'd30 && effective\_Y == 8'd35) || (effective\_X == 9'd30 && effective\_Y == 8'd36) || (effective\_X == 9'd30 && effective\_Y == 8'd37) || (effective\_X == 9'd30 && effective\_Y == 8'd38) ||

(effective\_X == 9'd31 && effective\_Y == 8'd18) || (effective\_X == 9'd31 && effective\_Y == 8'd19) || (effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) || (effective\_X == 9'd31 && effective\_Y == 8'd37) || (effective\_X == 9'd31 && effective\_Y == 8'd38) ||

(effective\_X == 9'd32 && effective\_Y == 8'd18) || (effective\_X == 9'd32 && effective\_Y == 8'd19) || (effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) || (effective\_X == 9'd32 && effective\_Y == 8'd37) || (effective\_X == 9'd32 && effective\_Y == 8'd38) ||

(effective\_X == 9'd33 && effective\_Y == 8'd18) || (effective\_X == 9'd33 && effective\_Y == 8'd19) || (effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) || (effective\_X == 9'd33 && effective\_Y == 8'd37) || (effective\_X == 9'd33 && effective\_Y == 8'd38) ||

(effective\_X == 9'd34 && effective\_Y == 8'd18) || (effective\_X == 9'd34 && effective\_Y == 8'd19) || (effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) || (effective\_X == 9'd34 && effective\_Y == 8'd37) || (effective\_X == 9'd34 && effective\_Y == 8'd38) ||

(effective\_X == 9'd35 && effective\_Y == 8'd18) || (effective\_X == 9'd35 && effective\_Y == 8'd19) || (effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) || (effective\_X == 9'd35 && effective\_Y == 8'd37) || (effective\_X == 9'd35 && effective\_Y == 8'd38) ||

(effective\_X == 9'd36 && effective\_Y == 8'd18) || (effective\_X == 9'd36 && effective\_Y == 8'd19) || (effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) || (effective\_X == 9'd36 && effective\_Y == 8'd37) || (effective\_X == 9'd36 && effective\_Y == 8'd38) ||

(effective\_X == 9'd37 && effective\_Y == 8'd18) || (effective\_X == 9'd37 && effective\_Y == 8'd19) || (effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) || (effective\_X == 9'd37 && effective\_Y == 8'd37) || (effective\_X == 9'd37 && effective\_Y == 8'd38) ||

(effective\_X == 9'd38 && effective\_Y == 8'd18) || (effective\_X == 9'd38 && effective\_Y == 8'd19) || (effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) || (effective\_X == 9'd38 && effective\_Y == 8'd37) || (effective\_X == 9'd38 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[4:2])) : 3'b111;

end

end

if (highscore == 12'd256) begin

if((effective\_X == 9'd15 && effective\_Y == 8'd18) || (effective\_X == 9'd15 && effective\_Y == 8'd19) || (effective\_X == 9'd15 && effective\_Y == 8'd27) || (effective\_X == 9'd15 && effective\_Y == 8'd28) || (effective\_X == 9'd15 && effective\_Y == 8'd29) || (effective\_X == 9'd15 && effective\_Y == 8'd30) || (effective\_X == 9'd15 && effective\_Y == 8'd31) || (effective\_X == 9'd15 && effective\_Y == 8'd32) || (effective\_X == 9'd15 && effective\_Y == 8'd33) || (effective\_X == 9'd15 && effective\_Y == 8'd34) || (effective\_X == 9'd15 && effective\_Y == 8'd35) || (effective\_X == 9'd15 && effective\_Y == 8'd36) || (effective\_X == 9'd15 && effective\_Y == 8'd37) || (effective\_X == 9'd15 && effective\_Y == 8'd38) ||

(effective\_X == 9'd16 && effective\_Y == 8'd18) || (effective\_X == 9'd16 && effective\_Y == 8'd19) || (effective\_X == 9'd16 && effective\_Y == 8'd27) || (effective\_X == 9'd16 && effective\_Y == 8'd28) || (effective\_X == 9'd16 && effective\_Y == 8'd29) || (effective\_X == 9'd16 && effective\_Y == 8'd30) || (effective\_X == 9'd16 && effective\_Y == 8'd31) || (effective\_X == 9'd16 && effective\_Y == 8'd32) || (effective\_X == 9'd16 && effective\_Y == 8'd33) || (effective\_X == 9'd16 && effective\_Y == 8'd34) || (effective\_X == 9'd16 && effective\_Y == 8'd35) || (effective\_X == 9'd16 && effective\_Y == 8'd36) || (effective\_X == 9'd16 && effective\_Y == 8'd37) || (effective\_X == 9'd16 && effective\_Y == 8'd38) ||

(effective\_X == 9'd17 && effective\_Y == 8'd18) || (effective\_X == 9'd17 && effective\_Y == 8'd19) || (effective\_X == 9'd17 && effective\_Y == 8'd27) || (effective\_X == 9'd17 && effective\_Y == 8'd28) || (effective\_X == 9'd17 && effective\_Y == 8'd37) || (effective\_X == 9'd17 && effective\_Y == 8'd38) ||

(effective\_X == 9'd18 && effective\_Y == 8'd18) || (effective\_X == 9'd18 && effective\_Y == 8'd19) || (effective\_X == 9'd18 && effective\_Y == 8'd27) || (effective\_X == 9'd18 && effective\_Y == 8'd28) || (effective\_X == 9'd18 && effective\_Y == 8'd37) || (effective\_X == 9'd18 && effective\_Y == 8'd38) ||

(effective\_X == 9'd19 && effective\_Y == 8'd18) || (effective\_X == 9'd19 && effective\_Y == 8'd19) || (effective\_X == 9'd19 && effective\_Y == 8'd27) || (effective\_X == 9'd19 && effective\_Y == 8'd28) || (effective\_X == 9'd19 && effective\_Y == 8'd37) || (effective\_X == 9'd19 && effective\_Y == 8'd38) ||

(effective\_X == 9'd20 && effective\_Y == 8'd18) || (effective\_X == 9'd20 && effective\_Y == 8'd19) || (effective\_X == 9'd20 && effective\_Y == 8'd27) || (effective\_X == 9'd20 && effective\_Y == 8'd28) || (effective\_X == 9'd20 && effective\_Y == 8'd37) || (effective\_X == 9'd20 && effective\_Y == 8'd38) ||

(effective\_X == 9'd21 && effective\_Y == 8'd18) || (effective\_X == 9'd21 && effective\_Y == 8'd19) || (effective\_X == 9'd21 && effective\_Y == 8'd27) || (effective\_X == 9'd21 && effective\_Y == 8'd28) || (effective\_X == 9'd21 && effective\_Y == 8'd37) || (effective\_X == 9'd21 && effective\_Y == 8'd38) ||

(effective\_X == 9'd22 && effective\_Y == 8'd18) || (effective\_X == 9'd22 && effective\_Y == 8'd19) || (effective\_X == 9'd22 && effective\_Y == 8'd27) || (effective\_X == 9'd22 && effective\_Y == 8'd28) || (effective\_X == 9'd22 && effective\_Y == 8'd37) || (effective\_X == 9'd22 && effective\_Y == 8'd38) ||

(effective\_X == 9'd23 && effective\_Y == 8'd18) || (effective\_X == 9'd23 && effective\_Y == 8'd19) || (effective\_X == 9'd23 && effective\_Y == 8'd27) || (effective\_X == 9'd23 && effective\_Y == 8'd28) || (effective\_X == 9'd23 && effective\_Y == 8'd37) || (effective\_X == 9'd23 && effective\_Y == 8'd38) ||

(effective\_X == 9'd24 && effective\_Y == 8'd18) || (effective\_X == 9'd24 && effective\_Y == 8'd19) || (effective\_X == 9'd24 && effective\_Y == 8'd27) || (effective\_X == 9'd24 && effective\_Y == 8'd28) || (effective\_X == 9'd24 && effective\_Y == 8'd37) || (effective\_X == 9'd24 && effective\_Y == 8'd38) ||

(effective\_X == 9'd25 && effective\_Y == 8'd18) || (effective\_X == 9'd25 && effective\_Y == 8'd19) || (effective\_X == 9'd25 && effective\_Y == 8'd20) || (effective\_X == 9'd25 && effective\_Y == 8'd21) || (effective\_X == 9'd25 && effective\_Y == 8'd22) || (effective\_X == 9'd25 && effective\_Y == 8'd23) || (effective\_X == 9'd25 && effective\_Y == 8'd24) || (effective\_X == 9'd25 && effective\_Y == 8'd25) || (effective\_X == 9'd25 && effective\_Y == 8'd26) || (effective\_X == 9'd25 && effective\_Y == 8'd27) || (effective\_X == 9'd25 && effective\_Y == 8'd28) || (effective\_X == 9'd25 && effective\_Y == 8'd37) || (effective\_X == 9'd25 && effective\_Y == 8'd38) ||

(effective\_X == 9'd26 && effective\_Y == 8'd18) || (effective\_X == 9'd26 && effective\_Y == 8'd19) || (effective\_X == 9'd26 && effective\_Y == 8'd20) || (effective\_X == 9'd26 && effective\_Y == 8'd21) || (effective\_X == 9'd26 && effective\_Y == 8'd22) || (effective\_X == 9'd26 && effective\_Y == 8'd23) || (effective\_X == 9'd26 && effective\_Y == 8'd24) || (effective\_X == 9'd26 && effective\_Y == 8'd25) || (effective\_X == 9'd26 && effective\_Y == 8'd26) || (effective\_X == 9'd26 && effective\_Y == 8'd27) || (effective\_X == 9'd26 && effective\_Y == 8'd28) || (effective\_X == 9'd26 && effective\_Y == 8'd37) || (effective\_X == 9'd26 && effective\_Y == 8'd38) ||

(effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd20) || (effective\_X == 9'd29 && effective\_Y == 8'd21) || (effective\_X == 9'd29 && effective\_Y == 8'd22) || (effective\_X == 9'd29 && effective\_Y == 8'd23) || (effective\_X == 9'd29 && effective\_Y == 8'd24) || (effective\_X == 9'd29 && effective\_Y == 8'd25) || (effective\_X == 9'd29 && effective\_Y == 8'd26) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) || (effective\_X == 9'd29 && effective\_Y == 8'd37) || (effective\_X == 9'd29 && effective\_Y == 8'd38) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd20) || (effective\_X == 9'd30 && effective\_Y == 8'd21) || (effective\_X == 9'd30 && effective\_Y == 8'd22) || (effective\_X == 9'd30 && effective\_Y == 8'd23) || (effective\_X == 9'd30 && effective\_Y == 8'd24) || (effective\_X == 9'd30 && effective\_Y == 8'd25) || (effective\_X == 9'd30 && effective\_Y == 8'd26) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) || (effective\_X == 9'd30 && effective\_Y == 8'd37) || (effective\_X == 9'd30 && effective\_Y == 8'd38) ||

(effective\_X == 9'd31 && effective\_Y == 8'd18) || (effective\_X == 9'd31 && effective\_Y == 8'd19) || (effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) || (effective\_X == 9'd31 && effective\_Y == 8'd37) || (effective\_X == 9'd31 && effective\_Y == 8'd38) ||

(effective\_X == 9'd32 && effective\_Y == 8'd18) || (effective\_X == 9'd32 && effective\_Y == 8'd19) || (effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) || (effective\_X == 9'd32 && effective\_Y == 8'd37) || (effective\_X == 9'd32 && effective\_Y == 8'd38) ||

(effective\_X == 9'd33 && effective\_Y == 8'd18) || (effective\_X == 9'd33 && effective\_Y == 8'd19) || (effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) || (effective\_X == 9'd33 && effective\_Y == 8'd37) || (effective\_X == 9'd33 && effective\_Y == 8'd38) ||

(effective\_X == 9'd34 && effective\_Y == 8'd18) || (effective\_X == 9'd34 && effective\_Y == 8'd19) || (effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) || (effective\_X == 9'd34 && effective\_Y == 8'd37) || (effective\_X == 9'd34 && effective\_Y == 8'd38) ||

(effective\_X == 9'd35 && effective\_Y == 8'd18) || (effective\_X == 9'd35 && effective\_Y == 8'd19) || (effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) || (effective\_X == 9'd35 && effective\_Y == 8'd37) || (effective\_X == 9'd35 && effective\_Y == 8'd38) ||

(effective\_X == 9'd36 && effective\_Y == 8'd18) || (effective\_X == 9'd36 && effective\_Y == 8'd19) || (effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) || (effective\_X == 9'd36 && effective\_Y == 8'd37) || (effective\_X == 9'd36 && effective\_Y == 8'd38) ||

(effective\_X == 9'd37 && effective\_Y == 8'd18) || (effective\_X == 9'd37 && effective\_Y == 8'd19) || (effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) || (effective\_X == 9'd37 && effective\_Y == 8'd37) || (effective\_X == 9'd37 && effective\_Y == 8'd38) ||

(effective\_X == 9'd38 && effective\_Y == 8'd18) || (effective\_X == 9'd38 && effective\_Y == 8'd19) || (effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) || (effective\_X == 9'd38 && effective\_Y == 8'd37) || (effective\_X == 9'd38 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[6:4] ^ randNum\_12b[9:7]) == 3'b0) ? 3'b111 : (randNum\_12b[6:4] ^ randNum\_12b[9:7])) : 3'b111;

end

end

if (highscore == 12'd512) begin

if((effective\_X == 9'd15 && effective\_Y == 8'd18) || (effective\_X == 9'd15 && effective\_Y == 8'd19) || (effective\_X == 9'd15 && effective\_Y == 8'd20) || (effective\_X == 9'd15 && effective\_Y == 8'd21) || (effective\_X == 9'd15 && effective\_Y == 8'd22) || (effective\_X == 9'd15 && effective\_Y == 8'd23) || (effective\_X == 9'd15 && effective\_Y == 8'd24) || (effective\_X == 9'd15 && effective\_Y == 8'd25) || (effective\_X == 9'd15 && effective\_Y == 8'd26) || (effective\_X == 9'd15 && effective\_Y == 8'd27) || (effective\_X == 9'd15 && effective\_Y == 8'd28) || (effective\_X == 9'd15 && effective\_Y == 8'd37) || (effective\_X == 9'd15 && effective\_Y == 8'd38) ||

(effective\_X == 9'd16 && effective\_Y == 8'd18) || (effective\_X == 9'd16 && effective\_Y == 8'd19) || (effective\_X == 9'd16 && effective\_Y == 8'd20) || (effective\_X == 9'd16 && effective\_Y == 8'd21) || (effective\_X == 9'd16 && effective\_Y == 8'd22) || (effective\_X == 9'd16 && effective\_Y == 8'd23) || (effective\_X == 9'd16 && effective\_Y == 8'd24) || (effective\_X == 9'd16 && effective\_Y == 8'd25) || (effective\_X == 9'd16 && effective\_Y == 8'd26) || (effective\_X == 9'd16 && effective\_Y == 8'd27) || (effective\_X == 9'd16 && effective\_Y == 8'd28) || (effective\_X == 9'd16 && effective\_Y == 8'd37) || (effective\_X == 9'd16 && effective\_Y == 8'd38) ||

(effective\_X == 9'd17 && effective\_Y == 8'd18) || (effective\_X == 9'd17 && effective\_Y == 8'd19) || (effective\_X == 9'd17 && effective\_Y == 8'd27) || (effective\_X == 9'd17 && effective\_Y == 8'd28) || (effective\_X == 9'd17 && effective\_Y == 8'd37) || (effective\_X == 9'd17 && effective\_Y == 8'd38) ||

(effective\_X == 9'd18 && effective\_Y == 8'd18) || (effective\_X == 9'd18 && effective\_Y == 8'd19) || (effective\_X == 9'd18 && effective\_Y == 8'd27) || (effective\_X == 9'd18 && effective\_Y == 8'd28) || (effective\_X == 9'd18 && effective\_Y == 8'd37) || (effective\_X == 9'd18 && effective\_Y == 8'd38) ||

(effective\_X == 9'd19 && effective\_Y == 8'd18) || (effective\_X == 9'd19 && effective\_Y == 8'd19) || (effective\_X == 9'd19 && effective\_Y == 8'd27) || (effective\_X == 9'd19 && effective\_Y == 8'd28) || (effective\_X == 9'd19 && effective\_Y == 8'd37) || (effective\_X == 9'd19 && effective\_Y == 8'd38) ||

(effective\_X == 9'd20 && effective\_Y == 8'd18) || (effective\_X == 9'd20 && effective\_Y == 8'd19) || (effective\_X == 9'd20 && effective\_Y == 8'd27) || (effective\_X == 9'd20 && effective\_Y == 8'd28) || (effective\_X == 9'd20 && effective\_Y == 8'd37) || (effective\_X == 9'd20 && effective\_Y == 8'd38) ||

(effective\_X == 9'd21 && effective\_Y == 8'd18) || (effective\_X == 9'd21 && effective\_Y == 8'd19) || (effective\_X == 9'd21 && effective\_Y == 8'd27) || (effective\_X == 9'd21 && effective\_Y == 8'd28) || (effective\_X == 9'd21 && effective\_Y == 8'd37) || (effective\_X == 9'd21 && effective\_Y == 8'd38) ||

(effective\_X == 9'd22 && effective\_Y == 8'd18) || (effective\_X == 9'd22 && effective\_Y == 8'd19) || (effective\_X == 9'd22 && effective\_Y == 8'd27) || (effective\_X == 9'd22 && effective\_Y == 8'd28) || (effective\_X == 9'd22 && effective\_Y == 8'd37) || (effective\_X == 9'd22 && effective\_Y == 8'd38) ||

(effective\_X == 9'd23 && effective\_Y == 8'd18) || (effective\_X == 9'd23 && effective\_Y == 8'd19) || (effective\_X == 9'd23 && effective\_Y == 8'd27) || (effective\_X == 9'd23 && effective\_Y == 8'd28) || (effective\_X == 9'd23 && effective\_Y == 8'd37) || (effective\_X == 9'd23 && effective\_Y == 8'd38) ||

(effective\_X == 9'd24 && effective\_Y == 8'd18) || (effective\_X == 9'd24 && effective\_Y == 8'd19) || (effective\_X == 9'd24 && effective\_Y == 8'd27) || (effective\_X == 9'd24 && effective\_Y == 8'd28) || (effective\_X == 9'd24 && effective\_Y == 8'd37) || (effective\_X == 9'd24 && effective\_Y == 8'd38) ||

(effective\_X == 9'd25 && effective\_Y == 8'd18) || (effective\_X == 9'd25 && effective\_Y == 8'd19) || (effective\_X == 9'd25 && effective\_Y == 8'd27) || (effective\_X == 9'd25 && effective\_Y == 8'd28) || (effective\_X == 9'd25 && effective\_Y == 8'd29) || (effective\_X == 9'd25 && effective\_Y == 8'd30) || (effective\_X == 9'd25 && effective\_Y == 8'd31) || (effective\_X == 9'd25 && effective\_Y == 8'd32) || (effective\_X == 9'd25 && effective\_Y == 8'd33) || (effective\_X == 9'd25 && effective\_Y == 8'd34) || (effective\_X == 9'd25 && effective\_Y == 8'd35) || (effective\_X == 9'd25 && effective\_Y == 8'd36) || (effective\_X == 9'd25 && effective\_Y == 8'd37) || (effective\_X == 9'd25 && effective\_Y == 8'd38) ||

(effective\_X == 9'd26 && effective\_Y == 8'd18) || (effective\_X == 9'd26 && effective\_Y == 8'd19) || (effective\_X == 9'd26 && effective\_Y == 8'd27) || (effective\_X == 9'd26 && effective\_Y == 8'd28) || (effective\_X == 9'd26 && effective\_Y == 8'd29) || (effective\_X == 9'd26 && effective\_Y == 8'd30) || (effective\_X == 9'd26 && effective\_Y == 8'd31) || (effective\_X == 9'd26 && effective\_Y == 8'd32) || (effective\_X == 9'd26 && effective\_Y == 8'd33) || (effective\_X == 9'd26 && effective\_Y == 8'd34) || (effective\_X == 9'd26 && effective\_Y == 8'd35) || (effective\_X == 9'd26 && effective\_Y == 8'd36) || (effective\_X == 9'd26 && effective\_Y == 8'd37) || (effective\_X == 9'd26 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[6:4] ^ randNum\_12b[5:3]) == 3'b0) ? 3'b111 : (randNum\_12b[6:4] ^ randNum\_12b[5:3])) : 3'b111;

end

end

if (highscore == 12'd1024) begin

if((effective\_X == 9'd11 && effective\_Y == 8'd18) || (effective\_X == 9'd11 && effective\_Y == 8'd19) || (effective\_X == 9'd11 && effective\_Y == 8'd20) || (effective\_X == 9'd11 && effective\_Y == 8'd21) || (effective\_X == 9'd11 && effective\_Y == 8'd22) || (effective\_X == 9'd11 && effective\_Y == 8'd23) || (effective\_X == 9'd11 && effective\_Y == 8'd24) || (effective\_X == 9'd11 && effective\_Y == 8'd25) || (effective\_X == 9'd11 && effective\_Y == 8'd26) || (effective\_X == 9'd11 && effective\_Y == 8'd27) || (effective\_X == 9'd11 && effective\_Y == 8'd28) || (effective\_X == 9'd11 && effective\_Y == 8'd29) || (effective\_X == 9'd11 && effective\_Y == 8'd30) || (effective\_X == 9'd11 && effective\_Y == 8'd31) || (effective\_X == 9'd11 && effective\_Y == 8'd32) || (effective\_X == 9'd11 && effective\_Y == 8'd33) || (effective\_X == 9'd11 && effective\_Y == 8'd34) || (effective\_X == 9'd11 && effective\_Y == 8'd35) || (effective\_X == 9'd11 && effective\_Y == 8'd36) || (effective\_X == 9'd11 && effective\_Y == 8'd37) || (effective\_X == 9'd11 && effective\_Y == 8'd38) ||

(effective\_X == 9'd12 && effective\_Y == 8'd18) || (effective\_X == 9'd12 && effective\_Y == 8'd19) || (effective\_X == 9'd12 && effective\_Y == 8'd20) || (effective\_X == 9'd12 && effective\_Y == 8'd21) || (effective\_X == 9'd12 && effective\_Y == 8'd22) || (effective\_X == 9'd12 && effective\_Y == 8'd23) || (effective\_X == 9'd12 && effective\_Y == 8'd24) || (effective\_X == 9'd12 && effective\_Y == 8'd25) || (effective\_X == 9'd12 && effective\_Y == 8'd26) || (effective\_X == 9'd12 && effective\_Y == 8'd27) || (effective\_X == 9'd12 && effective\_Y == 8'd28) || (effective\_X == 9'd12 && effective\_Y == 8'd29) || (effective\_X == 9'd12 && effective\_Y == 8'd30) || (effective\_X == 9'd12 && effective\_Y == 8'd31) || (effective\_X == 9'd12 && effective\_Y == 8'd32) || (effective\_X == 9'd12 && effective\_Y == 8'd33) || (effective\_X == 9'd12 && effective\_Y == 8'd34) || (effective\_X == 9'd12 && effective\_Y == 8'd35) || (effective\_X == 9'd12 && effective\_Y == 8'd36) || (effective\_X == 9'd12 && effective\_Y == 8'd37) || (effective\_X == 9'd12 && effective\_Y == 8'd38) ||

(effective\_X == 9'd15 && effective\_Y == 8'd18) || (effective\_X == 9'd15 && effective\_Y == 8'd19) || (effective\_X == 9'd15 && effective\_Y == 8'd20) || (effective\_X == 9'd15 && effective\_Y == 8'd21) || (effective\_X == 9'd15 && effective\_Y == 8'd22) || (effective\_X == 9'd15 && effective\_Y == 8'd23) || (effective\_X == 9'd15 && effective\_Y == 8'd24) || (effective\_X == 9'd15 && effective\_Y == 8'd25) || (effective\_X == 9'd15 && effective\_Y == 8'd26) || (effective\_X == 9'd15 && effective\_Y == 8'd27) || (effective\_X == 9'd15 && effective\_Y == 8'd28) || (effective\_X == 9'd15 && effective\_Y == 8'd29) || (effective\_X == 9'd15 && effective\_Y == 8'd30) || (effective\_X == 9'd15 && effective\_Y == 8'd31) || (effective\_X == 9'd15 && effective\_Y == 8'd32) || (effective\_X == 9'd15 && effective\_Y == 8'd33) || (effective\_X == 9'd15 && effective\_Y == 8'd34) || (effective\_X == 9'd15 && effective\_Y == 8'd35) || (effective\_X == 9'd15 && effective\_Y == 8'd36) || (effective\_X == 9'd15 && effective\_Y == 8'd37) || (effective\_X == 9'd15 && effective\_Y == 8'd38) ||

(effective\_X == 9'd16 && effective\_Y == 8'd18) || (effective\_X == 9'd16 && effective\_Y == 8'd19) || (effective\_X == 9'd16 && effective\_Y == 8'd20) || (effective\_X == 9'd16 && effective\_Y == 8'd21) || (effective\_X == 9'd16 && effective\_Y == 8'd22) || (effective\_X == 9'd16 && effective\_Y == 8'd23) || (effective\_X == 9'd16 && effective\_Y == 8'd24) || (effective\_X == 9'd16 && effective\_Y == 8'd25) || (effective\_X == 9'd16 && effective\_Y == 8'd26) || (effective\_X == 9'd16 && effective\_Y == 8'd27) || (effective\_X == 9'd16 && effective\_Y == 8'd28) || (effective\_X == 9'd16 && effective\_Y == 8'd29) || (effective\_X == 9'd16 && effective\_Y == 8'd30) || (effective\_X == 9'd16 && effective\_Y == 8'd31) || (effective\_X == 9'd16 && effective\_Y == 8'd32) || (effective\_X == 9'd16 && effective\_Y == 8'd33) || (effective\_X == 9'd16 && effective\_Y == 8'd34) || (effective\_X == 9'd16 && effective\_Y == 8'd35) || (effective\_X == 9'd16 && effective\_Y == 8'd36) || (effective\_X == 9'd16 && effective\_Y == 8'd37) || (effective\_X == 9'd16 && effective\_Y == 8'd38) ||

(effective\_X == 9'd17 && effective\_Y == 8'd18) || (effective\_X == 9'd17 && effective\_Y == 8'd19) || (effective\_X == 9'd17 && effective\_Y == 8'd37) || (effective\_X == 9'd17 && effective\_Y == 8'd38) ||

(effective\_X == 9'd18 && effective\_Y == 8'd18) || (effective\_X == 9'd18 && effective\_Y == 8'd19) || (effective\_X == 9'd18 && effective\_Y == 8'd37) || (effective\_X == 9'd18 && effective\_Y == 8'd38) ||

(effective\_X == 9'd19 && effective\_Y == 8'd18) || (effective\_X == 9'd19 && effective\_Y == 8'd19) || (effective\_X == 9'd19 && effective\_Y == 8'd37) || (effective\_X == 9'd19 && effective\_Y == 8'd38) ||

(effective\_X == 9'd20 && effective\_Y == 8'd18) || (effective\_X == 9'd20 && effective\_Y == 8'd19) || (effective\_X == 9'd20 && effective\_Y == 8'd37) || (effective\_X == 9'd20 && effective\_Y == 8'd38) ||

(effective\_X == 9'd21 && effective\_Y == 8'd18) || (effective\_X == 9'd21 && effective\_Y == 8'd19) || (effective\_X == 9'd21 && effective\_Y == 8'd37) || (effective\_X == 9'd21 && effective\_Y == 8'd38) ||

(effective\_X == 9'd22 && effective\_Y == 8'd18) || (effective\_X == 9'd22 && effective\_Y == 8'd19) || (effective\_X == 9'd22 && effective\_Y == 8'd37) || (effective\_X == 9'd22 && effective\_Y == 8'd38) ||

(effective\_X == 9'd23 && effective\_Y == 8'd18) || (effective\_X == 9'd23 && effective\_Y == 8'd19) || (effective\_X == 9'd23 && effective\_Y == 8'd37) || (effective\_X == 9'd23 && effective\_Y == 8'd38) ||

(effective\_X == 9'd24 && effective\_Y == 8'd18) || (effective\_X == 9'd24 && effective\_Y == 8'd19) || (effective\_X == 9'd24 && effective\_Y == 8'd37) || (effective\_X == 9'd24 && effective\_Y == 8'd38) ||

(effective\_X == 9'd25 && effective\_Y == 8'd18) || (effective\_X == 9'd25 && effective\_Y == 8'd19) || (effective\_X == 9'd25 && effective\_Y == 8'd20) || (effective\_X == 9'd25 && effective\_Y == 8'd21) || (effective\_X == 9'd25 && effective\_Y == 8'd22) || (effective\_X == 9'd25 && effective\_Y == 8'd23) || (effective\_X == 9'd25 && effective\_Y == 8'd24) || (effective\_X == 9'd25 && effective\_Y == 8'd25) || (effective\_X == 9'd25 && effective\_Y == 8'd26) || (effective\_X == 9'd25 && effective\_Y == 8'd27) || (effective\_X == 9'd25 && effective\_Y == 8'd28) || (effective\_X == 9'd25 && effective\_Y == 8'd29) || (effective\_X == 9'd25 && effective\_Y == 8'd30) || (effective\_X == 9'd25 && effective\_Y == 8'd31) || (effective\_X == 9'd25 && effective\_Y == 8'd32) || (effective\_X == 9'd25 && effective\_Y == 8'd33) || (effective\_X == 9'd25 && effective\_Y == 8'd34) || (effective\_X == 9'd25 && effective\_Y == 8'd35) || (effective\_X == 9'd25 && effective\_Y == 8'd36) || (effective\_X == 9'd25 && effective\_Y == 8'd37) || (effective\_X == 9'd25 && effective\_Y == 8'd38) ||

(effective\_X == 9'd26 && effective\_Y == 8'd18) || (effective\_X == 9'd26 && effective\_Y == 8'd19) || (effective\_X == 9'd26 && effective\_Y == 8'd20) || (effective\_X == 9'd26 && effective\_Y == 8'd21) || (effective\_X == 9'd26 && effective\_Y == 8'd22) || (effective\_X == 9'd26 && effective\_Y == 8'd23) || (effective\_X == 9'd26 && effective\_Y == 8'd24) || (effective\_X == 9'd26 && effective\_Y == 8'd25) || (effective\_X == 9'd26 && effective\_Y == 8'd26) || (effective\_X == 9'd26 && effective\_Y == 8'd27) || (effective\_X == 9'd26 && effective\_Y == 8'd28) || (effective\_X == 9'd26 && effective\_Y == 8'd29) || (effective\_X == 9'd26 && effective\_Y == 8'd30) || (effective\_X == 9'd26 && effective\_Y == 8'd31) || (effective\_X == 9'd26 && effective\_Y == 8'd32) || (effective\_X == 9'd26 && effective\_Y == 8'd33) || (effective\_X == 9'd26 && effective\_Y == 8'd34) || (effective\_X == 9'd26 && effective\_Y == 8'd35) || (effective\_X == 9'd26 && effective\_Y == 8'd36) || (effective\_X == 9'd26 && effective\_Y == 8'd37) || (effective\_X == 9'd26 && effective\_Y == 8'd38) ||

(effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) || (effective\_X == 9'd29 && effective\_Y == 8'd29) || (effective\_X == 9'd29 && effective\_Y == 8'd30) || (effective\_X == 9'd29 && effective\_Y == 8'd31) || (effective\_X == 9'd29 && effective\_Y == 8'd32) || (effective\_X == 9'd29 && effective\_Y == 8'd33) || (effective\_X == 9'd29 && effective\_Y == 8'd34) || (effective\_X == 9'd29 && effective\_Y == 8'd35) || (effective\_X == 9'd29 && effective\_Y == 8'd36) || (effective\_X == 9'd29 && effective\_Y == 8'd37) || (effective\_X == 9'd29 && effective\_Y == 8'd38) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) || (effective\_X == 9'd30 && effective\_Y == 8'd29) || (effective\_X == 9'd30 && effective\_Y == 8'd30) || (effective\_X == 9'd30 && effective\_Y == 8'd31) || (effective\_X == 9'd30 && effective\_Y == 8'd32) || (effective\_X == 9'd30 && effective\_Y == 8'd33) || (effective\_X == 9'd30 && effective\_Y == 8'd34) || (effective\_X == 9'd30 && effective\_Y == 8'd35) || (effective\_X == 9'd30 && effective\_Y == 8'd36) || (effective\_X == 9'd30 && effective\_Y == 8'd37) || (effective\_X == 9'd30 && effective\_Y == 8'd38) ||

(effective\_X == 9'd31 && effective\_Y == 8'd18) || (effective\_X == 9'd31 && effective\_Y == 8'd19) || (effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) || (effective\_X == 9'd31 && effective\_Y == 8'd37) || (effective\_X == 9'd31 && effective\_Y == 8'd38) ||

(effective\_X == 9'd32 && effective\_Y == 8'd18) || (effective\_X == 9'd32 && effective\_Y == 8'd19) || (effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) || (effective\_X == 9'd32 && effective\_Y == 8'd37) || (effective\_X == 9'd32 && effective\_Y == 8'd38) ||

(effective\_X == 9'd33 && effective\_Y == 8'd18) || (effective\_X == 9'd33 && effective\_Y == 8'd19) || (effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) || (effective\_X == 9'd33 && effective\_Y == 8'd37) || (effective\_X == 9'd33 && effective\_Y == 8'd38) ||

(effective\_X == 9'd34 && effective\_Y == 8'd18) || (effective\_X == 9'd34 && effective\_Y == 8'd19) || (effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) || (effective\_X == 9'd34 && effective\_Y == 8'd37) || (effective\_X == 9'd34 && effective\_Y == 8'd38) ||

(effective\_X == 9'd35 && effective\_Y == 8'd18) || (effective\_X == 9'd35 && effective\_Y == 8'd19) || (effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) || (effective\_X == 9'd35 && effective\_Y == 8'd37) || (effective\_X == 9'd35 && effective\_Y == 8'd38) ||

(effective\_X == 9'd36 && effective\_Y == 8'd18) || (effective\_X == 9'd36 && effective\_Y == 8'd19) || (effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) || (effective\_X == 9'd36 && effective\_Y == 8'd37) || (effective\_X == 9'd36 && effective\_Y == 8'd38) ||

(effective\_X == 9'd37 && effective\_Y == 8'd18) || (effective\_X == 9'd37 && effective\_Y == 8'd19) || (effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) || (effective\_X == 9'd37 && effective\_Y == 8'd37) || (effective\_X == 9'd37 && effective\_Y == 8'd38) ||

(effective\_X == 9'd38 && effective\_Y == 8'd18) || (effective\_X == 9'd38 && effective\_Y == 8'd19) || (effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) || (effective\_X == 9'd38 && effective\_Y == 8'd37) || (effective\_X == 9'd38 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) ||

(effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) ||

(effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) ||

(effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) ||

(effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) ||

(effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) ||

(effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) ||

(effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) ||

(effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[9:7]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[9:7])) : 3'b111;

end

end

if (highscore == 12'd2048) begin

if((effective\_X == 9'd1 && effective\_Y == 8'd18) || (effective\_X == 9'd1 && effective\_Y == 8'd19) || (effective\_X == 9'd1 && effective\_Y == 8'd27) || (effective\_X == 9'd1 && effective\_Y == 8'd28) || (effective\_X == 9'd1 && effective\_Y == 8'd29) || (effective\_X == 9'd1 && effective\_Y == 8'd30) || (effective\_X == 9'd1 && effective\_Y == 8'd31) || (effective\_X == 9'd1 && effective\_Y == 8'd32) || (effective\_X == 9'd1 && effective\_Y == 8'd33) || (effective\_X == 9'd1 && effective\_Y == 8'd34) || (effective\_X == 9'd1 && effective\_Y == 8'd35) || (effective\_X == 9'd1 && effective\_Y == 8'd36) || (effective\_X == 9'd1 && effective\_Y == 8'd37) || (effective\_X == 9'd1 && effective\_Y == 8'd38) ||

(effective\_X == 9'd2 && effective\_Y == 8'd18) || (effective\_X == 9'd2 && effective\_Y == 8'd19) || (effective\_X == 9'd2 && effective\_Y == 8'd27) || (effective\_X == 9'd2 && effective\_Y == 8'd28) || (effective\_X == 9'd2 && effective\_Y == 8'd29) || (effective\_X == 9'd2 && effective\_Y == 8'd30) || (effective\_X == 9'd2 && effective\_Y == 8'd31) || (effective\_X == 9'd2 && effective\_Y == 8'd32) || (effective\_X == 9'd2 && effective\_Y == 8'd33) || (effective\_X == 9'd2 && effective\_Y == 8'd34) || (effective\_X == 9'd2 && effective\_Y == 8'd35) || (effective\_X == 9'd2 && effective\_Y == 8'd36) || (effective\_X == 9'd2 && effective\_Y == 8'd37) || (effective\_X == 9'd2 && effective\_Y == 8'd38) ||

(effective\_X == 9'd3 && effective\_Y == 8'd18) || (effective\_X == 9'd3 && effective\_Y == 8'd19) || (effective\_X == 9'd3 && effective\_Y == 8'd27) || (effective\_X == 9'd3 && effective\_Y == 8'd28) || (effective\_X == 9'd3 && effective\_Y == 8'd37) || (effective\_X == 9'd3 && effective\_Y == 8'd38) ||

(effective\_X == 9'd4 && effective\_Y == 8'd18) || (effective\_X == 9'd4 && effective\_Y == 8'd19) || (effective\_X == 9'd4 && effective\_Y == 8'd27) || (effective\_X == 9'd4 && effective\_Y == 8'd28) || (effective\_X == 9'd4 && effective\_Y == 8'd37) || (effective\_X == 9'd4 && effective\_Y == 8'd38) ||

(effective\_X == 9'd5 && effective\_Y == 8'd18) || (effective\_X == 9'd5 && effective\_Y == 8'd19) || (effective\_X == 9'd5 && effective\_Y == 8'd27) || (effective\_X == 9'd5 && effective\_Y == 8'd28) || (effective\_X == 9'd5 && effective\_Y == 8'd37) || (effective\_X == 9'd5 && effective\_Y == 8'd38) ||

(effective\_X == 9'd6 && effective\_Y == 8'd18) || (effective\_X == 9'd6 && effective\_Y == 8'd19) || (effective\_X == 9'd6 && effective\_Y == 8'd27) || (effective\_X == 9'd6 && effective\_Y == 8'd28) || (effective\_X == 9'd6 && effective\_Y == 8'd37) || (effective\_X == 9'd6 && effective\_Y == 8'd38) ||

(effective\_X == 9'd7 && effective\_Y == 8'd18) || (effective\_X == 9'd7 && effective\_Y == 8'd19) || (effective\_X == 9'd7 && effective\_Y == 8'd27) || (effective\_X == 9'd7 && effective\_Y == 8'd28) || (effective\_X == 9'd7 && effective\_Y == 8'd37) || (effective\_X == 9'd7 && effective\_Y == 8'd38) ||

(effective\_X == 9'd8 && effective\_Y == 8'd18) || (effective\_X == 9'd8 && effective\_Y == 8'd19) || (effective\_X == 9'd8 && effective\_Y == 8'd27) || (effective\_X == 9'd8 && effective\_Y == 8'd28) || (effective\_X == 9'd8 && effective\_Y == 8'd37) || (effective\_X == 9'd8 && effective\_Y == 8'd38) ||

(effective\_X == 9'd9 && effective\_Y == 8'd18) || (effective\_X == 9'd9 && effective\_Y == 8'd19) || (effective\_X == 9'd9 && effective\_Y == 8'd27) || (effective\_X == 9'd9 && effective\_Y == 8'd28) || (effective\_X == 9'd9 && effective\_Y == 8'd37) || (effective\_X == 9'd9 && effective\_Y == 8'd38) ||

(effective\_X == 9'd10 && effective\_Y == 8'd18) || (effective\_X == 9'd10 && effective\_Y == 8'd19) || (effective\_X == 9'd10 && effective\_Y == 8'd27) || (effective\_X == 9'd10 && effective\_Y == 8'd28) || (effective\_X == 9'd10 && effective\_Y == 8'd37) || (effective\_X == 9'd10 && effective\_Y == 8'd38) ||

(effective\_X == 9'd11 && effective\_Y == 8'd18) || (effective\_X == 9'd11 && effective\_Y == 8'd19) || (effective\_X == 9'd11 && effective\_Y == 8'd20) || (effective\_X == 9'd11 && effective\_Y == 8'd21) || (effective\_X == 9'd11 && effective\_Y == 8'd22) || (effective\_X == 9'd11 && effective\_Y == 8'd23) || (effective\_X == 9'd11 && effective\_Y == 8'd24) || (effective\_X == 9'd11 && effective\_Y == 8'd25) || (effective\_X == 9'd11 && effective\_Y == 8'd26) || (effective\_X == 9'd11 && effective\_Y == 8'd27) || (effective\_X == 9'd11 && effective\_Y == 8'd28) || (effective\_X == 9'd11 && effective\_Y == 8'd37) || (effective\_X == 9'd11 && effective\_Y == 8'd38) ||

(effective\_X == 9'd12 && effective\_Y == 8'd18) || (effective\_X == 9'd12 && effective\_Y == 8'd19) || (effective\_X == 9'd12 && effective\_Y == 8'd20) || (effective\_X == 9'd12 && effective\_Y == 8'd21) || (effective\_X == 9'd12 && effective\_Y == 8'd22) || (effective\_X == 9'd12 && effective\_Y == 8'd23) || (effective\_X == 9'd12 && effective\_Y == 8'd24) || (effective\_X == 9'd12 && effective\_Y == 8'd25) || (effective\_X == 9'd12 && effective\_Y == 8'd26) || (effective\_X == 9'd12 && effective\_Y == 8'd27) || (effective\_X == 9'd12 && effective\_Y == 8'd28) || (effective\_X == 9'd12 && effective\_Y == 8'd37) || (effective\_X == 9'd12 && effective\_Y == 8'd38) ||

(effective\_X == 9'd15 && effective\_Y == 8'd18) || (effective\_X == 9'd15 && effective\_Y == 8'd19) || (effective\_X == 9'd15 && effective\_Y == 8'd20) || (effective\_X == 9'd15 && effective\_Y == 8'd21) || (effective\_X == 9'd15 && effective\_Y == 8'd22) || (effective\_X == 9'd15 && effective\_Y == 8'd23) || (effective\_X == 9'd15 && effective\_Y == 8'd24) || (effective\_X == 9'd15 && effective\_Y == 8'd25) || (effective\_X == 9'd15 && effective\_Y == 8'd26) || (effective\_X == 9'd15 && effective\_Y == 8'd27) || (effective\_X == 9'd15 && effective\_Y == 8'd28) || (effective\_X == 9'd15 && effective\_Y == 8'd29) || (effective\_X == 9'd15 && effective\_Y == 8'd30) || (effective\_X == 9'd15 && effective\_Y == 8'd31) || (effective\_X == 9'd15 && effective\_Y == 8'd32) || (effective\_X == 9'd15 && effective\_Y == 8'd33) || (effective\_X == 9'd15 && effective\_Y == 8'd34) || (effective\_X == 9'd15 && effective\_Y == 8'd35) || (effective\_X == 9'd15 && effective\_Y == 8'd36) || (effective\_X == 9'd15 && effective\_Y == 8'd37) || (effective\_X == 9'd15 && effective\_Y == 8'd38) ||

(effective\_X == 9'd16 && effective\_Y == 8'd18) || (effective\_X == 9'd16 && effective\_Y == 8'd19) || (effective\_X == 9'd16 && effective\_Y == 8'd20) || (effective\_X == 9'd16 && effective\_Y == 8'd21) || (effective\_X == 9'd16 && effective\_Y == 8'd22) || (effective\_X == 9'd16 && effective\_Y == 8'd23) || (effective\_X == 9'd16 && effective\_Y == 8'd24) || (effective\_X == 9'd16 && effective\_Y == 8'd25) || (effective\_X == 9'd16 && effective\_Y == 8'd26) || (effective\_X == 9'd16 && effective\_Y == 8'd27) || (effective\_X == 9'd16 && effective\_Y == 8'd28) || (effective\_X == 9'd16 && effective\_Y == 8'd29) || (effective\_X == 9'd16 && effective\_Y == 8'd30) || (effective\_X == 9'd16 && effective\_Y == 8'd31) || (effective\_X == 9'd16 && effective\_Y == 8'd32) || (effective\_X == 9'd16 && effective\_Y == 8'd33) || (effective\_X == 9'd16 && effective\_Y == 8'd34) || (effective\_X == 9'd16 && effective\_Y == 8'd35) || (effective\_X == 9'd16 && effective\_Y == 8'd36) || (effective\_X == 9'd16 && effective\_Y == 8'd37) || (effective\_X == 9'd16 && effective\_Y == 8'd38) ||

(effective\_X == 9'd17 && effective\_Y == 8'd18) || (effective\_X == 9'd17 && effective\_Y == 8'd19) || (effective\_X == 9'd17 && effective\_Y == 8'd37) || (effective\_X == 9'd17 && effective\_Y == 8'd38) ||

(effective\_X == 9'd18 && effective\_Y == 8'd18) || (effective\_X == 9'd18 && effective\_Y == 8'd19) || (effective\_X == 9'd18 && effective\_Y == 8'd37) || (effective\_X == 9'd18 && effective\_Y == 8'd38) ||

(effective\_X == 9'd19 && effective\_Y == 8'd18) || (effective\_X == 9'd19 && effective\_Y == 8'd19) || (effective\_X == 9'd19 && effective\_Y == 8'd37) || (effective\_X == 9'd19 && effective\_Y == 8'd38) ||

(effective\_X == 9'd20 && effective\_Y == 8'd18) || (effective\_X == 9'd20 && effective\_Y == 8'd19) || (effective\_X == 9'd20 && effective\_Y == 8'd37) || (effective\_X == 9'd20 && effective\_Y == 8'd38) ||

(effective\_X == 9'd21 && effective\_Y == 8'd18) || (effective\_X == 9'd21 && effective\_Y == 8'd19) || (effective\_X == 9'd21 && effective\_Y == 8'd37) || (effective\_X == 9'd21 && effective\_Y == 8'd38) ||

(effective\_X == 9'd22 && effective\_Y == 8'd18) || (effective\_X == 9'd22 && effective\_Y == 8'd19) || (effective\_X == 9'd22 && effective\_Y == 8'd37) || (effective\_X == 9'd22 && effective\_Y == 8'd38) ||

(effective\_X == 9'd23 && effective\_Y == 8'd18) || (effective\_X == 9'd23 && effective\_Y == 8'd19) || (effective\_X == 9'd23 && effective\_Y == 8'd37) || (effective\_X == 9'd23 && effective\_Y == 8'd38) ||

(effective\_X == 9'd24 && effective\_Y == 8'd18) || (effective\_X == 9'd24 && effective\_Y == 8'd19) || (effective\_X == 9'd24 && effective\_Y == 8'd37) || (effective\_X == 9'd24 && effective\_Y == 8'd38) ||

(effective\_X == 9'd25 && effective\_Y == 8'd18) || (effective\_X == 9'd25 && effective\_Y == 8'd19) || (effective\_X == 9'd25 && effective\_Y == 8'd20) || (effective\_X == 9'd25 && effective\_Y == 8'd21) || (effective\_X == 9'd25 && effective\_Y == 8'd22) || (effective\_X == 9'd25 && effective\_Y == 8'd23) || (effective\_X == 9'd25 && effective\_Y == 8'd24) || (effective\_X == 9'd25 && effective\_Y == 8'd25) || (effective\_X == 9'd25 && effective\_Y == 8'd26) || (effective\_X == 9'd25 && effective\_Y == 8'd27) || (effective\_X == 9'd25 && effective\_Y == 8'd28) || (effective\_X == 9'd25 && effective\_Y == 8'd29) || (effective\_X == 9'd25 && effective\_Y == 8'd30) || (effective\_X == 9'd25 && effective\_Y == 8'd31) || (effective\_X == 9'd25 && effective\_Y == 8'd32) || (effective\_X == 9'd25 && effective\_Y == 8'd33) || (effective\_X == 9'd25 && effective\_Y == 8'd34) || (effective\_X == 9'd25 && effective\_Y == 8'd35) || (effective\_X == 9'd25 && effective\_Y == 8'd36) || (effective\_X == 9'd25 && effective\_Y == 8'd37) || (effective\_X == 9'd25 && effective\_Y == 8'd38) ||

(effective\_X == 9'd26 && effective\_Y == 8'd18) || (effective\_X == 9'd26 && effective\_Y == 8'd19) || (effective\_X == 9'd26 && effective\_Y == 8'd20) || (effective\_X == 9'd26 && effective\_Y == 8'd21) || (effective\_X == 9'd26 && effective\_Y == 8'd22) || (effective\_X == 9'd26 && effective\_Y == 8'd23) || (effective\_X == 9'd26 && effective\_Y == 8'd24) || (effective\_X == 9'd26 && effective\_Y == 8'd25) || (effective\_X == 9'd26 && effective\_Y == 8'd26) || (effective\_X == 9'd26 && effective\_Y == 8'd27) || (effective\_X == 9'd26 && effective\_Y == 8'd28) || (effective\_X == 9'd26 && effective\_Y == 8'd29) || (effective\_X == 9'd26 && effective\_Y == 8'd30) || (effective\_X == 9'd26 && effective\_Y == 8'd31) || (effective\_X == 9'd26 && effective\_Y == 8'd32) || (effective\_X == 9'd26 && effective\_Y == 8'd33) || (effective\_X == 9'd26 && effective\_Y == 8'd34) || (effective\_X == 9'd26 && effective\_Y == 8'd35) || (effective\_X == 9'd26 && effective\_Y == 8'd36) || (effective\_X == 9'd26 && effective\_Y == 8'd37) || (effective\_X == 9'd26 && effective\_Y == 8'd38) ||

(effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd20) || (effective\_X == 9'd29 && effective\_Y == 8'd21) || (effective\_X == 9'd29 && effective\_Y == 8'd22) || (effective\_X == 9'd29 && effective\_Y == 8'd23) || (effective\_X == 9'd29 && effective\_Y == 8'd24) || (effective\_X == 9'd29 && effective\_Y == 8'd25) || (effective\_X == 9'd29 && effective\_Y == 8'd26) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd20) || (effective\_X == 9'd30 && effective\_Y == 8'd21) || (effective\_X == 9'd30 && effective\_Y == 8'd22) || (effective\_X == 9'd30 && effective\_Y == 8'd23) || (effective\_X == 9'd30 && effective\_Y == 8'd24) || (effective\_X == 9'd30 && effective\_Y == 8'd25) || (effective\_X == 9'd30 && effective\_Y == 8'd26) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) ||

(effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) ||

(effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) ||

(effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) ||

(effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) ||

(effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) ||

(effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) ||

(effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) ||

(effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[6:4]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[6:4])) : 3'b111;

end

end

// if (highscore == 12'd4096) begin

// if(effective\_X == 6'd1 && effective\_Y == 6'd1 ||

// effective\_X == 6'd2 && effective\_Y == 6'd2 ||

// effective\_X == 6'd3 && effective\_Y == 6'd3 ||

// effective\_X == 6'd4 && effective\_Y == 6'd4 ||

// effective\_X == 6'd5 && effective\_Y == 6'd5 ||

// effective\_X == 6'd6 && effective\_Y == 6'd6 ||

// effective\_X == 6'd7 && effective\_Y == 6'd7 ||

// effective\_X == 6'd8 && effective\_Y == 6'd8 ||

// effective\_X == 6'd9 && effective\_Y == 6'd9 ||

// effective\_X == 6'd10 && effective\_Y == 6'd10 ||

// effective\_X == 6'd11 && effective\_Y == 6'd11 ||

// effective\_X == 6'd12 && effective\_Y == 6'd12) begin

// pixel\_colour = 3'b111;

// end

// end

end

end

if (screen\_X <= 9'd239 && screen\_Y <= 9'd239) begin

if (screen\_X == 9'd0 || // For drawing borders and lines

screen\_X == 9'd1 ||

screen\_X == 9'd2 ||

screen\_X == 9'd60 ||

screen\_X == 9'd61 ||

screen\_X == 9'd119 ||

screen\_X == 9'd120 ||

screen\_X == 9'd178 ||

screen\_X == 9'd179 ||

screen\_X == 9'd237 ||

screen\_X == 9'd238 ||

screen\_X == 9'd239 ||

screen\_Y == 8'd0 ||

screen\_Y == 8'd1 ||

screen\_Y == 8'd2 ||

screen\_Y == 8'd60 ||

screen\_Y == 8'd61 ||

screen\_Y == 8'd119 ||

screen\_Y == 8'd120 ||

screen\_Y == 8'd178 ||

screen\_Y == 8'd179 ||

screen\_Y == 8'd237 ||

screen\_Y == 8'd238 ||

screen\_Y == 8'd239) begin

pixel\_colour = colourful ? (((randNum\_12b[9:7] ^ randNum\_12b[11:9]) == 3'b0) ? 3'b111 : (randNum\_12b[9:7] ^ randNum\_12b[11:9])) : 3'b111;

end

else begin

if (screen\_X <= 2'd3) begin

effective\_X = 6'd0;

end

else begin

effective\_X = ((screen\_X - 2'd3) - ((gameBoard\_cur\_X) \* (6'd59)));

end

if (screen\_Y <= 2'd3) begin

effective\_Y = 6'd0;

end

else begin

effective\_Y = ((screen\_Y - 2'd3) - ((gameBoard\_cur\_Y) \* (6'd59)));

end

if (gameBoard\_cur\_Value == 12'd0) begin

end

if (gameBoard\_cur\_Value == 12'd2) begin

if((effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[7:5] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[7:5] ^ randNum\_12b[4:2])) : 3'b111;

end

end

if (gameBoard\_cur\_Value == 12'd4) begin

if((effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) ||

(effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) ||

(effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) ||

(effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) ||

(effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) ||

(effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) ||

(effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) ||

(effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) ||

(effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[4:2])) : 3'b111;

end

end

if (gameBoard\_cur\_Value == 12'd8) begin

if((effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[3:1]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[3:1])) : 3'b111;

end

end

if (gameBoard\_cur\_Value == 12'd16) begin

if((effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38)||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38)||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38)||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38)||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38)||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38)||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38)||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38)||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38)||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38)||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38)||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38)||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[6:4] ^ randNum\_12b[7:5]) == 3'b0) ? 3'b111 : (randNum\_12b[6:4] ^ randNum\_12b[7:5])) : 3'b111;

end

end

if (gameBoard\_cur\_Value == 12'd32) begin

if((effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) || (effective\_X == 9'd29 && effective\_Y == 8'd37) || (effective\_X == 9'd29 && effective\_Y == 8'd38) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) || (effective\_X == 9'd30 && effective\_Y == 8'd37) || (effective\_X == 9'd30 && effective\_Y == 8'd38) ||

(effective\_X == 9'd31 && effective\_Y == 8'd18) || (effective\_X == 9'd31 && effective\_Y == 8'd19) || (effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) || (effective\_X == 9'd31 && effective\_Y == 8'd37) || (effective\_X == 9'd31 && effective\_Y == 8'd38) ||

(effective\_X == 9'd32 && effective\_Y == 8'd18) || (effective\_X == 9'd32 && effective\_Y == 8'd19) || (effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) || (effective\_X == 9'd32 && effective\_Y == 8'd37) || (effective\_X == 9'd32 && effective\_Y == 8'd38) ||

(effective\_X == 9'd33 && effective\_Y == 8'd18) || (effective\_X == 9'd33 && effective\_Y == 8'd19) || (effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) || (effective\_X == 9'd33 && effective\_Y == 8'd37) || (effective\_X == 9'd33 && effective\_Y == 8'd38) ||

(effective\_X == 9'd34 && effective\_Y == 8'd18) || (effective\_X == 9'd34 && effective\_Y == 8'd19) || (effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) || (effective\_X == 9'd34 && effective\_Y == 8'd37) || (effective\_X == 9'd34 && effective\_Y == 8'd38) ||

(effective\_X == 9'd35 && effective\_Y == 8'd18) || (effective\_X == 9'd35 && effective\_Y == 8'd19) || (effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) || (effective\_X == 9'd35 && effective\_Y == 8'd37) || (effective\_X == 9'd35 && effective\_Y == 8'd38) ||

(effective\_X == 9'd36 && effective\_Y == 8'd18) || (effective\_X == 9'd36 && effective\_Y == 8'd19) || (effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) || (effective\_X == 9'd36 && effective\_Y == 8'd37) || (effective\_X == 9'd36 && effective\_Y == 8'd38) ||

(effective\_X == 9'd37 && effective\_Y == 8'd18) || (effective\_X == 9'd37 && effective\_Y == 8'd19) || (effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) || (effective\_X == 9'd37 && effective\_Y == 8'd37) || (effective\_X == 9'd37 && effective\_Y == 8'd38) ||

(effective\_X == 9'd38 && effective\_Y == 8'd18) || (effective\_X == 9'd38 && effective\_Y == 8'd19) || (effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) || (effective\_X == 9'd38 && effective\_Y == 8'd37) || (effective\_X == 9'd38 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[4:2] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[4:2] ^ randNum\_12b[4:2])) : 3'b111;

end

end

if (gameBoard\_cur\_Value == 12'd64) begin

if((effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd20) || (effective\_X == 9'd29 && effective\_Y == 8'd21) || (effective\_X == 9'd29 && effective\_Y == 8'd22) || (effective\_X == 9'd29 && effective\_Y == 8'd23) || (effective\_X == 9'd29 && effective\_Y == 8'd24) || (effective\_X == 9'd29 && effective\_Y == 8'd25) || (effective\_X == 9'd29 && effective\_Y == 8'd26) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) || (effective\_X == 9'd29 && effective\_Y == 8'd29) || (effective\_X == 9'd29 && effective\_Y == 8'd30) || (effective\_X == 9'd29 && effective\_Y == 8'd31) || (effective\_X == 9'd29 && effective\_Y == 8'd32) || (effective\_X == 9'd29 && effective\_Y == 8'd33) || (effective\_X == 9'd29 && effective\_Y == 8'd34) || (effective\_X == 9'd29 && effective\_Y == 8'd35) || (effective\_X == 9'd29 && effective\_Y == 8'd36) || (effective\_X == 9'd29 && effective\_Y == 8'd37) || (effective\_X == 9'd29 && effective\_Y == 8'd38) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd20) || (effective\_X == 9'd30 && effective\_Y == 8'd21) || (effective\_X == 9'd30 && effective\_Y == 8'd22) || (effective\_X == 9'd30 && effective\_Y == 8'd23) || (effective\_X == 9'd30 && effective\_Y == 8'd24) || (effective\_X == 9'd30 && effective\_Y == 8'd25) || (effective\_X == 9'd30 && effective\_Y == 8'd26) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) || (effective\_X == 9'd30 && effective\_Y == 8'd29) || (effective\_X == 9'd30 && effective\_Y == 8'd30) || (effective\_X == 9'd30 && effective\_Y == 8'd31) || (effective\_X == 9'd30 && effective\_Y == 8'd32) || (effective\_X == 9'd30 && effective\_Y == 8'd33) || (effective\_X == 9'd30 && effective\_Y == 8'd34) || (effective\_X == 9'd30 && effective\_Y == 8'd35) || (effective\_X == 9'd30 && effective\_Y == 8'd36) || (effective\_X == 9'd30 && effective\_Y == 8'd37) || (effective\_X == 9'd30 && effective\_Y == 8'd38) ||

(effective\_X == 9'd31 && effective\_Y == 8'd18) || (effective\_X == 9'd31 && effective\_Y == 8'd19) || (effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) || (effective\_X == 9'd31 && effective\_Y == 8'd37) || (effective\_X == 9'd31 && effective\_Y == 8'd38) ||

(effective\_X == 9'd32 && effective\_Y == 8'd18) || (effective\_X == 9'd32 && effective\_Y == 8'd19) || (effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) || (effective\_X == 9'd32 && effective\_Y == 8'd37) || (effective\_X == 9'd32 && effective\_Y == 8'd38) ||

(effective\_X == 9'd33 && effective\_Y == 8'd18) || (effective\_X == 9'd33 && effective\_Y == 8'd19) || (effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) || (effective\_X == 9'd33 && effective\_Y == 8'd37) || (effective\_X == 9'd33 && effective\_Y == 8'd38) ||

(effective\_X == 9'd34 && effective\_Y == 8'd18) || (effective\_X == 9'd34 && effective\_Y == 8'd19) || (effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) || (effective\_X == 9'd34 && effective\_Y == 8'd37) || (effective\_X == 9'd34 && effective\_Y == 8'd38) ||

(effective\_X == 9'd35 && effective\_Y == 8'd18) || (effective\_X == 9'd35 && effective\_Y == 8'd19) || (effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) || (effective\_X == 9'd35 && effective\_Y == 8'd37) || (effective\_X == 9'd35 && effective\_Y == 8'd38) ||

(effective\_X == 9'd36 && effective\_Y == 8'd18) || (effective\_X == 9'd36 && effective\_Y == 8'd19) || (effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) || (effective\_X == 9'd36 && effective\_Y == 8'd37) || (effective\_X == 9'd36 && effective\_Y == 8'd38) ||

(effective\_X == 9'd37 && effective\_Y == 8'd18) || (effective\_X == 9'd37 && effective\_Y == 8'd19) || (effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) || (effective\_X == 9'd37 && effective\_Y == 8'd37) || (effective\_X == 9'd37 && effective\_Y == 8'd38) ||

(effective\_X == 9'd38 && effective\_Y == 8'd18) || (effective\_X == 9'd38 && effective\_Y == 8'd19) || (effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) || (effective\_X == 9'd38 && effective\_Y == 8'd37) || (effective\_X == 9'd38 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) ||

(effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) ||

(effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) ||

(effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) ||

(effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) ||

(effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) ||

(effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) ||

(effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) ||

(effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[7:5] ^ randNum\_12b[8:6]) == 3'b0) ? 3'b111 : (randNum\_12b[7:5] ^ randNum\_12b[8:6])) : 3'b111;

end

end

if (gameBoard\_cur\_Value == 12'd128) begin

if((effective\_X == 9'd25 && effective\_Y == 8'd18) || (effective\_X == 9'd25 && effective\_Y == 8'd19) || (effective\_X == 9'd25 && effective\_Y == 8'd20) || (effective\_X == 9'd25 && effective\_Y == 8'd21) || (effective\_X == 9'd25 && effective\_Y == 8'd22) || (effective\_X == 9'd25 && effective\_Y == 8'd23) || (effective\_X == 9'd25 && effective\_Y == 8'd24) || (effective\_X == 9'd25 && effective\_Y == 8'd25) || (effective\_X == 9'd25 && effective\_Y == 8'd26) || (effective\_X == 9'd25 && effective\_Y == 8'd27) || (effective\_X == 9'd25 && effective\_Y == 8'd28) || (effective\_X == 9'd25 && effective\_Y == 8'd29) || (effective\_X == 9'd25 && effective\_Y == 8'd30) || (effective\_X == 9'd25 && effective\_Y == 8'd31) || (effective\_X == 9'd25 && effective\_Y == 8'd32) || (effective\_X == 9'd25 && effective\_Y == 8'd33) || (effective\_X == 9'd25 && effective\_Y == 8'd34) || (effective\_X == 9'd25 && effective\_Y == 8'd35) || (effective\_X == 9'd25 && effective\_Y == 8'd36) || (effective\_X == 9'd25 && effective\_Y == 8'd37) || (effective\_X == 9'd25 && effective\_Y == 8'd38) ||

(effective\_X == 9'd26 && effective\_Y == 8'd18) || (effective\_X == 9'd26 && effective\_Y == 8'd19) || (effective\_X == 9'd26 && effective\_Y == 8'd20) || (effective\_X == 9'd26 && effective\_Y == 8'd21) || (effective\_X == 9'd26 && effective\_Y == 8'd22) || (effective\_X == 9'd26 && effective\_Y == 8'd23) || (effective\_X == 9'd26 && effective\_Y == 8'd24) || (effective\_X == 9'd26 && effective\_Y == 8'd25) || (effective\_X == 9'd26 && effective\_Y == 8'd26) || (effective\_X == 9'd26 && effective\_Y == 8'd27) || (effective\_X == 9'd26 && effective\_Y == 8'd28) || (effective\_X == 9'd26 && effective\_Y == 8'd29) || (effective\_X == 9'd26 && effective\_Y == 8'd30) || (effective\_X == 9'd26 && effective\_Y == 8'd31) || (effective\_X == 9'd26 && effective\_Y == 8'd32) || (effective\_X == 9'd26 && effective\_Y == 8'd33) || (effective\_X == 9'd26 && effective\_Y == 8'd34) || (effective\_X == 9'd26 && effective\_Y == 8'd35) || (effective\_X == 9'd26 && effective\_Y == 8'd36) || (effective\_X == 9'd26 && effective\_Y == 8'd37) || (effective\_X == 9'd26 && effective\_Y == 8'd38) ||

(effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) || (effective\_X == 9'd29 && effective\_Y == 8'd29) || (effective\_X == 9'd29 && effective\_Y == 8'd30) || (effective\_X == 9'd29 && effective\_Y == 8'd31) || (effective\_X == 9'd29 && effective\_Y == 8'd32) || (effective\_X == 9'd29 && effective\_Y == 8'd33) || (effective\_X == 9'd29 && effective\_Y == 8'd34) || (effective\_X == 9'd29 && effective\_Y == 8'd35) || (effective\_X == 9'd29 && effective\_Y == 8'd36) || (effective\_X == 9'd29 && effective\_Y == 8'd37) || (effective\_X == 9'd29 && effective\_Y == 8'd38) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) || (effective\_X == 9'd30 && effective\_Y == 8'd29) || (effective\_X == 9'd30 && effective\_Y == 8'd30) || (effective\_X == 9'd30 && effective\_Y == 8'd31) || (effective\_X == 9'd30 && effective\_Y == 8'd32) || (effective\_X == 9'd30 && effective\_Y == 8'd33) || (effective\_X == 9'd30 && effective\_Y == 8'd34) || (effective\_X == 9'd30 && effective\_Y == 8'd35) || (effective\_X == 9'd30 && effective\_Y == 8'd36) || (effective\_X == 9'd30 && effective\_Y == 8'd37) || (effective\_X == 9'd30 && effective\_Y == 8'd38) ||

(effective\_X == 9'd31 && effective\_Y == 8'd18) || (effective\_X == 9'd31 && effective\_Y == 8'd19) || (effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) || (effective\_X == 9'd31 && effective\_Y == 8'd37) || (effective\_X == 9'd31 && effective\_Y == 8'd38) ||

(effective\_X == 9'd32 && effective\_Y == 8'd18) || (effective\_X == 9'd32 && effective\_Y == 8'd19) || (effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) || (effective\_X == 9'd32 && effective\_Y == 8'd37) || (effective\_X == 9'd32 && effective\_Y == 8'd38) ||

(effective\_X == 9'd33 && effective\_Y == 8'd18) || (effective\_X == 9'd33 && effective\_Y == 8'd19) || (effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) || (effective\_X == 9'd33 && effective\_Y == 8'd37) || (effective\_X == 9'd33 && effective\_Y == 8'd38) ||

(effective\_X == 9'd34 && effective\_Y == 8'd18) || (effective\_X == 9'd34 && effective\_Y == 8'd19) || (effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) || (effective\_X == 9'd34 && effective\_Y == 8'd37) || (effective\_X == 9'd34 && effective\_Y == 8'd38) ||

(effective\_X == 9'd35 && effective\_Y == 8'd18) || (effective\_X == 9'd35 && effective\_Y == 8'd19) || (effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) || (effective\_X == 9'd35 && effective\_Y == 8'd37) || (effective\_X == 9'd35 && effective\_Y == 8'd38) ||

(effective\_X == 9'd36 && effective\_Y == 8'd18) || (effective\_X == 9'd36 && effective\_Y == 8'd19) || (effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) || (effective\_X == 9'd36 && effective\_Y == 8'd37) || (effective\_X == 9'd36 && effective\_Y == 8'd38) ||

(effective\_X == 9'd37 && effective\_Y == 8'd18) || (effective\_X == 9'd37 && effective\_Y == 8'd19) || (effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) || (effective\_X == 9'd37 && effective\_Y == 8'd37) || (effective\_X == 9'd37 && effective\_Y == 8'd38) ||

(effective\_X == 9'd38 && effective\_Y == 8'd18) || (effective\_X == 9'd38 && effective\_Y == 8'd19) || (effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) || (effective\_X == 9'd38 && effective\_Y == 8'd37) || (effective\_X == 9'd38 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[11:9] ^ randNum\_12b[4:2]) == 3'b0) ? 3'b111 : (randNum\_12b[11:9] ^ randNum\_12b[4:2])) : 3'b111;

end

end

if (gameBoard\_cur\_Value == 12'd256) begin

if((effective\_X == 9'd15 && effective\_Y == 8'd18) || (effective\_X == 9'd15 && effective\_Y == 8'd19) || (effective\_X == 9'd15 && effective\_Y == 8'd27) || (effective\_X == 9'd15 && effective\_Y == 8'd28) || (effective\_X == 9'd15 && effective\_Y == 8'd29) || (effective\_X == 9'd15 && effective\_Y == 8'd30) || (effective\_X == 9'd15 && effective\_Y == 8'd31) || (effective\_X == 9'd15 && effective\_Y == 8'd32) || (effective\_X == 9'd15 && effective\_Y == 8'd33) || (effective\_X == 9'd15 && effective\_Y == 8'd34) || (effective\_X == 9'd15 && effective\_Y == 8'd35) || (effective\_X == 9'd15 && effective\_Y == 8'd36) || (effective\_X == 9'd15 && effective\_Y == 8'd37) || (effective\_X == 9'd15 && effective\_Y == 8'd38) ||

(effective\_X == 9'd16 && effective\_Y == 8'd18) || (effective\_X == 9'd16 && effective\_Y == 8'd19) || (effective\_X == 9'd16 && effective\_Y == 8'd27) || (effective\_X == 9'd16 && effective\_Y == 8'd28) || (effective\_X == 9'd16 && effective\_Y == 8'd29) || (effective\_X == 9'd16 && effective\_Y == 8'd30) || (effective\_X == 9'd16 && effective\_Y == 8'd31) || (effective\_X == 9'd16 && effective\_Y == 8'd32) || (effective\_X == 9'd16 && effective\_Y == 8'd33) || (effective\_X == 9'd16 && effective\_Y == 8'd34) || (effective\_X == 9'd16 && effective\_Y == 8'd35) || (effective\_X == 9'd16 && effective\_Y == 8'd36) || (effective\_X == 9'd16 && effective\_Y == 8'd37) || (effective\_X == 9'd16 && effective\_Y == 8'd38) ||

(effective\_X == 9'd17 && effective\_Y == 8'd18) || (effective\_X == 9'd17 && effective\_Y == 8'd19) || (effective\_X == 9'd17 && effective\_Y == 8'd27) || (effective\_X == 9'd17 && effective\_Y == 8'd28) || (effective\_X == 9'd17 && effective\_Y == 8'd37) || (effective\_X == 9'd17 && effective\_Y == 8'd38) ||

(effective\_X == 9'd18 && effective\_Y == 8'd18) || (effective\_X == 9'd18 && effective\_Y == 8'd19) || (effective\_X == 9'd18 && effective\_Y == 8'd27) || (effective\_X == 9'd18 && effective\_Y == 8'd28) || (effective\_X == 9'd18 && effective\_Y == 8'd37) || (effective\_X == 9'd18 && effective\_Y == 8'd38) ||

(effective\_X == 9'd19 && effective\_Y == 8'd18) || (effective\_X == 9'd19 && effective\_Y == 8'd19) || (effective\_X == 9'd19 && effective\_Y == 8'd27) || (effective\_X == 9'd19 && effective\_Y == 8'd28) || (effective\_X == 9'd19 && effective\_Y == 8'd37) || (effective\_X == 9'd19 && effective\_Y == 8'd38) ||

(effective\_X == 9'd20 && effective\_Y == 8'd18) || (effective\_X == 9'd20 && effective\_Y == 8'd19) || (effective\_X == 9'd20 && effective\_Y == 8'd27) || (effective\_X == 9'd20 && effective\_Y == 8'd28) || (effective\_X == 9'd20 && effective\_Y == 8'd37) || (effective\_X == 9'd20 && effective\_Y == 8'd38) ||

(effective\_X == 9'd21 && effective\_Y == 8'd18) || (effective\_X == 9'd21 && effective\_Y == 8'd19) || (effective\_X == 9'd21 && effective\_Y == 8'd27) || (effective\_X == 9'd21 && effective\_Y == 8'd28) || (effective\_X == 9'd21 && effective\_Y == 8'd37) || (effective\_X == 9'd21 && effective\_Y == 8'd38) ||

(effective\_X == 9'd22 && effective\_Y == 8'd18) || (effective\_X == 9'd22 && effective\_Y == 8'd19) || (effective\_X == 9'd22 && effective\_Y == 8'd27) || (effective\_X == 9'd22 && effective\_Y == 8'd28) || (effective\_X == 9'd22 && effective\_Y == 8'd37) || (effective\_X == 9'd22 && effective\_Y == 8'd38) ||

(effective\_X == 9'd23 && effective\_Y == 8'd18) || (effective\_X == 9'd23 && effective\_Y == 8'd19) || (effective\_X == 9'd23 && effective\_Y == 8'd27) || (effective\_X == 9'd23 && effective\_Y == 8'd28) || (effective\_X == 9'd23 && effective\_Y == 8'd37) || (effective\_X == 9'd23 && effective\_Y == 8'd38) ||

(effective\_X == 9'd24 && effective\_Y == 8'd18) || (effective\_X == 9'd24 && effective\_Y == 8'd19) || (effective\_X == 9'd24 && effective\_Y == 8'd27) || (effective\_X == 9'd24 && effective\_Y == 8'd28) || (effective\_X == 9'd24 && effective\_Y == 8'd37) || (effective\_X == 9'd24 && effective\_Y == 8'd38) ||

(effective\_X == 9'd25 && effective\_Y == 8'd18) || (effective\_X == 9'd25 && effective\_Y == 8'd19) || (effective\_X == 9'd25 && effective\_Y == 8'd20) || (effective\_X == 9'd25 && effective\_Y == 8'd21) || (effective\_X == 9'd25 && effective\_Y == 8'd22) || (effective\_X == 9'd25 && effective\_Y == 8'd23) || (effective\_X == 9'd25 && effective\_Y == 8'd24) || (effective\_X == 9'd25 && effective\_Y == 8'd25) || (effective\_X == 9'd25 && effective\_Y == 8'd26) || (effective\_X == 9'd25 && effective\_Y == 8'd27) || (effective\_X == 9'd25 && effective\_Y == 8'd28) || (effective\_X == 9'd25 && effective\_Y == 8'd37) || (effective\_X == 9'd25 && effective\_Y == 8'd38) ||

(effective\_X == 9'd26 && effective\_Y == 8'd18) || (effective\_X == 9'd26 && effective\_Y == 8'd19) || (effective\_X == 9'd26 && effective\_Y == 8'd20) || (effective\_X == 9'd26 && effective\_Y == 8'd21) || (effective\_X == 9'd26 && effective\_Y == 8'd22) || (effective\_X == 9'd26 && effective\_Y == 8'd23) || (effective\_X == 9'd26 && effective\_Y == 8'd24) || (effective\_X == 9'd26 && effective\_Y == 8'd25) || (effective\_X == 9'd26 && effective\_Y == 8'd26) || (effective\_X == 9'd26 && effective\_Y == 8'd27) || (effective\_X == 9'd26 && effective\_Y == 8'd28) || (effective\_X == 9'd26 && effective\_Y == 8'd37) || (effective\_X == 9'd26 && effective\_Y == 8'd38) ||

(effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd20) || (effective\_X == 9'd29 && effective\_Y == 8'd21) || (effective\_X == 9'd29 && effective\_Y == 8'd22) || (effective\_X == 9'd29 && effective\_Y == 8'd23) || (effective\_X == 9'd29 && effective\_Y == 8'd24) || (effective\_X == 9'd29 && effective\_Y == 8'd25) || (effective\_X == 9'd29 && effective\_Y == 8'd26) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) || (effective\_X == 9'd29 && effective\_Y == 8'd37) || (effective\_X == 9'd29 && effective\_Y == 8'd38) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd20) || (effective\_X == 9'd30 && effective\_Y == 8'd21) || (effective\_X == 9'd30 && effective\_Y == 8'd22) || (effective\_X == 9'd30 && effective\_Y == 8'd23) || (effective\_X == 9'd30 && effective\_Y == 8'd24) || (effective\_X == 9'd30 && effective\_Y == 8'd25) || (effective\_X == 9'd30 && effective\_Y == 8'd26) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) || (effective\_X == 9'd30 && effective\_Y == 8'd37) || (effective\_X == 9'd30 && effective\_Y == 8'd38) ||

(effective\_X == 9'd31 && effective\_Y == 8'd18) || (effective\_X == 9'd31 && effective\_Y == 8'd19) || (effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) || (effective\_X == 9'd31 && effective\_Y == 8'd37) || (effective\_X == 9'd31 && effective\_Y == 8'd38) ||

(effective\_X == 9'd32 && effective\_Y == 8'd18) || (effective\_X == 9'd32 && effective\_Y == 8'd19) || (effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) || (effective\_X == 9'd32 && effective\_Y == 8'd37) || (effective\_X == 9'd32 && effective\_Y == 8'd38) ||

(effective\_X == 9'd33 && effective\_Y == 8'd18) || (effective\_X == 9'd33 && effective\_Y == 8'd19) || (effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) || (effective\_X == 9'd33 && effective\_Y == 8'd37) || (effective\_X == 9'd33 && effective\_Y == 8'd38) ||

(effective\_X == 9'd34 && effective\_Y == 8'd18) || (effective\_X == 9'd34 && effective\_Y == 8'd19) || (effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) || (effective\_X == 9'd34 && effective\_Y == 8'd37) || (effective\_X == 9'd34 && effective\_Y == 8'd38) ||

(effective\_X == 9'd35 && effective\_Y == 8'd18) || (effective\_X == 9'd35 && effective\_Y == 8'd19) || (effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) || (effective\_X == 9'd35 && effective\_Y == 8'd37) || (effective\_X == 9'd35 && effective\_Y == 8'd38) ||

(effective\_X == 9'd36 && effective\_Y == 8'd18) || (effective\_X == 9'd36 && effective\_Y == 8'd19) || (effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) || (effective\_X == 9'd36 && effective\_Y == 8'd37) || (effective\_X == 9'd36 && effective\_Y == 8'd38) ||

(effective\_X == 9'd37 && effective\_Y == 8'd18) || (effective\_X == 9'd37 && effective\_Y == 8'd19) || (effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) || (effective\_X == 9'd37 && effective\_Y == 8'd37) || (effective\_X == 9'd37 && effective\_Y == 8'd38) ||

(effective\_X == 9'd38 && effective\_Y == 8'd18) || (effective\_X == 9'd38 && effective\_Y == 8'd19) || (effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) || (effective\_X == 9'd38 && effective\_Y == 8'd37) || (effective\_X == 9'd38 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[6:4] ^ randNum\_12b[9:7]) == 3'b0) ? 3'b111 : (randNum\_12b[6:4] ^ randNum\_12b[9:7])) : 3'b111;

end

end

if (gameBoard\_cur\_Value == 12'd512) begin

if((effective\_X == 9'd15 && effective\_Y == 8'd18) || (effective\_X == 9'd15 && effective\_Y == 8'd19) || (effective\_X == 9'd15 && effective\_Y == 8'd20) || (effective\_X == 9'd15 && effective\_Y == 8'd21) || (effective\_X == 9'd15 && effective\_Y == 8'd22) || (effective\_X == 9'd15 && effective\_Y == 8'd23) || (effective\_X == 9'd15 && effective\_Y == 8'd24) || (effective\_X == 9'd15 && effective\_Y == 8'd25) || (effective\_X == 9'd15 && effective\_Y == 8'd26) || (effective\_X == 9'd15 && effective\_Y == 8'd27) || (effective\_X == 9'd15 && effective\_Y == 8'd28) || (effective\_X == 9'd15 && effective\_Y == 8'd37) || (effective\_X == 9'd15 && effective\_Y == 8'd38) ||

(effective\_X == 9'd16 && effective\_Y == 8'd18) || (effective\_X == 9'd16 && effective\_Y == 8'd19) || (effective\_X == 9'd16 && effective\_Y == 8'd20) || (effective\_X == 9'd16 && effective\_Y == 8'd21) || (effective\_X == 9'd16 && effective\_Y == 8'd22) || (effective\_X == 9'd16 && effective\_Y == 8'd23) || (effective\_X == 9'd16 && effective\_Y == 8'd24) || (effective\_X == 9'd16 && effective\_Y == 8'd25) || (effective\_X == 9'd16 && effective\_Y == 8'd26) || (effective\_X == 9'd16 && effective\_Y == 8'd27) || (effective\_X == 9'd16 && effective\_Y == 8'd28) || (effective\_X == 9'd16 && effective\_Y == 8'd37) || (effective\_X == 9'd16 && effective\_Y == 8'd38) ||

(effective\_X == 9'd17 && effective\_Y == 8'd18) || (effective\_X == 9'd17 && effective\_Y == 8'd19) || (effective\_X == 9'd17 && effective\_Y == 8'd27) || (effective\_X == 9'd17 && effective\_Y == 8'd28) || (effective\_X == 9'd17 && effective\_Y == 8'd37) || (effective\_X == 9'd17 && effective\_Y == 8'd38) ||

(effective\_X == 9'd18 && effective\_Y == 8'd18) || (effective\_X == 9'd18 && effective\_Y == 8'd19) || (effective\_X == 9'd18 && effective\_Y == 8'd27) || (effective\_X == 9'd18 && effective\_Y == 8'd28) || (effective\_X == 9'd18 && effective\_Y == 8'd37) || (effective\_X == 9'd18 && effective\_Y == 8'd38) ||

(effective\_X == 9'd19 && effective\_Y == 8'd18) || (effective\_X == 9'd19 && effective\_Y == 8'd19) || (effective\_X == 9'd19 && effective\_Y == 8'd27) || (effective\_X == 9'd19 && effective\_Y == 8'd28) || (effective\_X == 9'd19 && effective\_Y == 8'd37) || (effective\_X == 9'd19 && effective\_Y == 8'd38) ||

(effective\_X == 9'd20 && effective\_Y == 8'd18) || (effective\_X == 9'd20 && effective\_Y == 8'd19) || (effective\_X == 9'd20 && effective\_Y == 8'd27) || (effective\_X == 9'd20 && effective\_Y == 8'd28) || (effective\_X == 9'd20 && effective\_Y == 8'd37) || (effective\_X == 9'd20 && effective\_Y == 8'd38) ||

(effective\_X == 9'd21 && effective\_Y == 8'd18) || (effective\_X == 9'd21 && effective\_Y == 8'd19) || (effective\_X == 9'd21 && effective\_Y == 8'd27) || (effective\_X == 9'd21 && effective\_Y == 8'd28) || (effective\_X == 9'd21 && effective\_Y == 8'd37) || (effective\_X == 9'd21 && effective\_Y == 8'd38) ||

(effective\_X == 9'd22 && effective\_Y == 8'd18) || (effective\_X == 9'd22 && effective\_Y == 8'd19) || (effective\_X == 9'd22 && effective\_Y == 8'd27) || (effective\_X == 9'd22 && effective\_Y == 8'd28) || (effective\_X == 9'd22 && effective\_Y == 8'd37) || (effective\_X == 9'd22 && effective\_Y == 8'd38) ||

(effective\_X == 9'd23 && effective\_Y == 8'd18) || (effective\_X == 9'd23 && effective\_Y == 8'd19) || (effective\_X == 9'd23 && effective\_Y == 8'd27) || (effective\_X == 9'd23 && effective\_Y == 8'd28) || (effective\_X == 9'd23 && effective\_Y == 8'd37) || (effective\_X == 9'd23 && effective\_Y == 8'd38) ||

(effective\_X == 9'd24 && effective\_Y == 8'd18) || (effective\_X == 9'd24 && effective\_Y == 8'd19) || (effective\_X == 9'd24 && effective\_Y == 8'd27) || (effective\_X == 9'd24 && effective\_Y == 8'd28) || (effective\_X == 9'd24 && effective\_Y == 8'd37) || (effective\_X == 9'd24 && effective\_Y == 8'd38) ||

(effective\_X == 9'd25 && effective\_Y == 8'd18) || (effective\_X == 9'd25 && effective\_Y == 8'd19) || (effective\_X == 9'd25 && effective\_Y == 8'd27) || (effective\_X == 9'd25 && effective\_Y == 8'd28) || (effective\_X == 9'd25 && effective\_Y == 8'd29) || (effective\_X == 9'd25 && effective\_Y == 8'd30) || (effective\_X == 9'd25 && effective\_Y == 8'd31) || (effective\_X == 9'd25 && effective\_Y == 8'd32) || (effective\_X == 9'd25 && effective\_Y == 8'd33) || (effective\_X == 9'd25 && effective\_Y == 8'd34) || (effective\_X == 9'd25 && effective\_Y == 8'd35) || (effective\_X == 9'd25 && effective\_Y == 8'd36) || (effective\_X == 9'd25 && effective\_Y == 8'd37) || (effective\_X == 9'd25 && effective\_Y == 8'd38) ||

(effective\_X == 9'd26 && effective\_Y == 8'd18) || (effective\_X == 9'd26 && effective\_Y == 8'd19) || (effective\_X == 9'd26 && effective\_Y == 8'd27) || (effective\_X == 9'd26 && effective\_Y == 8'd28) || (effective\_X == 9'd26 && effective\_Y == 8'd29) || (effective\_X == 9'd26 && effective\_Y == 8'd30) || (effective\_X == 9'd26 && effective\_Y == 8'd31) || (effective\_X == 9'd26 && effective\_Y == 8'd32) || (effective\_X == 9'd26 && effective\_Y == 8'd33) || (effective\_X == 9'd26 && effective\_Y == 8'd34) || (effective\_X == 9'd26 && effective\_Y == 8'd35) || (effective\_X == 9'd26 && effective\_Y == 8'd36) || (effective\_X == 9'd26 && effective\_Y == 8'd37) || (effective\_X == 9'd26 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[6:4] ^ randNum\_12b[5:3]) == 3'b0) ? 3'b111 : (randNum\_12b[6:4] ^ randNum\_12b[5:3])) : 3'b111;

end

end

if (gameBoard\_cur\_Value == 12'd1024) begin

if((effective\_X == 9'd11 && effective\_Y == 8'd18) || (effective\_X == 9'd11 && effective\_Y == 8'd19) || (effective\_X == 9'd11 && effective\_Y == 8'd20) || (effective\_X == 9'd11 && effective\_Y == 8'd21) || (effective\_X == 9'd11 && effective\_Y == 8'd22) || (effective\_X == 9'd11 && effective\_Y == 8'd23) || (effective\_X == 9'd11 && effective\_Y == 8'd24) || (effective\_X == 9'd11 && effective\_Y == 8'd25) || (effective\_X == 9'd11 && effective\_Y == 8'd26) || (effective\_X == 9'd11 && effective\_Y == 8'd27) || (effective\_X == 9'd11 && effective\_Y == 8'd28) || (effective\_X == 9'd11 && effective\_Y == 8'd29) || (effective\_X == 9'd11 && effective\_Y == 8'd30) || (effective\_X == 9'd11 && effective\_Y == 8'd31) || (effective\_X == 9'd11 && effective\_Y == 8'd32) || (effective\_X == 9'd11 && effective\_Y == 8'd33) || (effective\_X == 9'd11 && effective\_Y == 8'd34) || (effective\_X == 9'd11 && effective\_Y == 8'd35) || (effective\_X == 9'd11 && effective\_Y == 8'd36) || (effective\_X == 9'd11 && effective\_Y == 8'd37) || (effective\_X == 9'd11 && effective\_Y == 8'd38) ||

(effective\_X == 9'd12 && effective\_Y == 8'd18) || (effective\_X == 9'd12 && effective\_Y == 8'd19) || (effective\_X == 9'd12 && effective\_Y == 8'd20) || (effective\_X == 9'd12 && effective\_Y == 8'd21) || (effective\_X == 9'd12 && effective\_Y == 8'd22) || (effective\_X == 9'd12 && effective\_Y == 8'd23) || (effective\_X == 9'd12 && effective\_Y == 8'd24) || (effective\_X == 9'd12 && effective\_Y == 8'd25) || (effective\_X == 9'd12 && effective\_Y == 8'd26) || (effective\_X == 9'd12 && effective\_Y == 8'd27) || (effective\_X == 9'd12 && effective\_Y == 8'd28) || (effective\_X == 9'd12 && effective\_Y == 8'd29) || (effective\_X == 9'd12 && effective\_Y == 8'd30) || (effective\_X == 9'd12 && effective\_Y == 8'd31) || (effective\_X == 9'd12 && effective\_Y == 8'd32) || (effective\_X == 9'd12 && effective\_Y == 8'd33) || (effective\_X == 9'd12 && effective\_Y == 8'd34) || (effective\_X == 9'd12 && effective\_Y == 8'd35) || (effective\_X == 9'd12 && effective\_Y == 8'd36) || (effective\_X == 9'd12 && effective\_Y == 8'd37) || (effective\_X == 9'd12 && effective\_Y == 8'd38) ||

(effective\_X == 9'd15 && effective\_Y == 8'd18) || (effective\_X == 9'd15 && effective\_Y == 8'd19) || (effective\_X == 9'd15 && effective\_Y == 8'd20) || (effective\_X == 9'd15 && effective\_Y == 8'd21) || (effective\_X == 9'd15 && effective\_Y == 8'd22) || (effective\_X == 9'd15 && effective\_Y == 8'd23) || (effective\_X == 9'd15 && effective\_Y == 8'd24) || (effective\_X == 9'd15 && effective\_Y == 8'd25) || (effective\_X == 9'd15 && effective\_Y == 8'd26) || (effective\_X == 9'd15 && effective\_Y == 8'd27) || (effective\_X == 9'd15 && effective\_Y == 8'd28) || (effective\_X == 9'd15 && effective\_Y == 8'd29) || (effective\_X == 9'd15 && effective\_Y == 8'd30) || (effective\_X == 9'd15 && effective\_Y == 8'd31) || (effective\_X == 9'd15 && effective\_Y == 8'd32) || (effective\_X == 9'd15 && effective\_Y == 8'd33) || (effective\_X == 9'd15 && effective\_Y == 8'd34) || (effective\_X == 9'd15 && effective\_Y == 8'd35) || (effective\_X == 9'd15 && effective\_Y == 8'd36) || (effective\_X == 9'd15 && effective\_Y == 8'd37) || (effective\_X == 9'd15 && effective\_Y == 8'd38) ||

(effective\_X == 9'd16 && effective\_Y == 8'd18) || (effective\_X == 9'd16 && effective\_Y == 8'd19) || (effective\_X == 9'd16 && effective\_Y == 8'd20) || (effective\_X == 9'd16 && effective\_Y == 8'd21) || (effective\_X == 9'd16 && effective\_Y == 8'd22) || (effective\_X == 9'd16 && effective\_Y == 8'd23) || (effective\_X == 9'd16 && effective\_Y == 8'd24) || (effective\_X == 9'd16 && effective\_Y == 8'd25) || (effective\_X == 9'd16 && effective\_Y == 8'd26) || (effective\_X == 9'd16 && effective\_Y == 8'd27) || (effective\_X == 9'd16 && effective\_Y == 8'd28) || (effective\_X == 9'd16 && effective\_Y == 8'd29) || (effective\_X == 9'd16 && effective\_Y == 8'd30) || (effective\_X == 9'd16 && effective\_Y == 8'd31) || (effective\_X == 9'd16 && effective\_Y == 8'd32) || (effective\_X == 9'd16 && effective\_Y == 8'd33) || (effective\_X == 9'd16 && effective\_Y == 8'd34) || (effective\_X == 9'd16 && effective\_Y == 8'd35) || (effective\_X == 9'd16 && effective\_Y == 8'd36) || (effective\_X == 9'd16 && effective\_Y == 8'd37) || (effective\_X == 9'd16 && effective\_Y == 8'd38) ||

(effective\_X == 9'd17 && effective\_Y == 8'd18) || (effective\_X == 9'd17 && effective\_Y == 8'd19) || (effective\_X == 9'd17 && effective\_Y == 8'd37) || (effective\_X == 9'd17 && effective\_Y == 8'd38) ||

(effective\_X == 9'd18 && effective\_Y == 8'd18) || (effective\_X == 9'd18 && effective\_Y == 8'd19) || (effective\_X == 9'd18 && effective\_Y == 8'd37) || (effective\_X == 9'd18 && effective\_Y == 8'd38) ||

(effective\_X == 9'd19 && effective\_Y == 8'd18) || (effective\_X == 9'd19 && effective\_Y == 8'd19) || (effective\_X == 9'd19 && effective\_Y == 8'd37) || (effective\_X == 9'd19 && effective\_Y == 8'd38) ||

(effective\_X == 9'd20 && effective\_Y == 8'd18) || (effective\_X == 9'd20 && effective\_Y == 8'd19) || (effective\_X == 9'd20 && effective\_Y == 8'd37) || (effective\_X == 9'd20 && effective\_Y == 8'd38) ||

(effective\_X == 9'd21 && effective\_Y == 8'd18) || (effective\_X == 9'd21 && effective\_Y == 8'd19) || (effective\_X == 9'd21 && effective\_Y == 8'd37) || (effective\_X == 9'd21 && effective\_Y == 8'd38) ||

(effective\_X == 9'd22 && effective\_Y == 8'd18) || (effective\_X == 9'd22 && effective\_Y == 8'd19) || (effective\_X == 9'd22 && effective\_Y == 8'd37) || (effective\_X == 9'd22 && effective\_Y == 8'd38) ||

(effective\_X == 9'd23 && effective\_Y == 8'd18) || (effective\_X == 9'd23 && effective\_Y == 8'd19) || (effective\_X == 9'd23 && effective\_Y == 8'd37) || (effective\_X == 9'd23 && effective\_Y == 8'd38) ||

(effective\_X == 9'd24 && effective\_Y == 8'd18) || (effective\_X == 9'd24 && effective\_Y == 8'd19) || (effective\_X == 9'd24 && effective\_Y == 8'd37) || (effective\_X == 9'd24 && effective\_Y == 8'd38) ||

(effective\_X == 9'd25 && effective\_Y == 8'd18) || (effective\_X == 9'd25 && effective\_Y == 8'd19) || (effective\_X == 9'd25 && effective\_Y == 8'd20) || (effective\_X == 9'd25 && effective\_Y == 8'd21) || (effective\_X == 9'd25 && effective\_Y == 8'd22) || (effective\_X == 9'd25 && effective\_Y == 8'd23) || (effective\_X == 9'd25 && effective\_Y == 8'd24) || (effective\_X == 9'd25 && effective\_Y == 8'd25) || (effective\_X == 9'd25 && effective\_Y == 8'd26) || (effective\_X == 9'd25 && effective\_Y == 8'd27) || (effective\_X == 9'd25 && effective\_Y == 8'd28) || (effective\_X == 9'd25 && effective\_Y == 8'd29) || (effective\_X == 9'd25 && effective\_Y == 8'd30) || (effective\_X == 9'd25 && effective\_Y == 8'd31) || (effective\_X == 9'd25 && effective\_Y == 8'd32) || (effective\_X == 9'd25 && effective\_Y == 8'd33) || (effective\_X == 9'd25 && effective\_Y == 8'd34) || (effective\_X == 9'd25 && effective\_Y == 8'd35) || (effective\_X == 9'd25 && effective\_Y == 8'd36) || (effective\_X == 9'd25 && effective\_Y == 8'd37) || (effective\_X == 9'd25 && effective\_Y == 8'd38) ||

(effective\_X == 9'd26 && effective\_Y == 8'd18) || (effective\_X == 9'd26 && effective\_Y == 8'd19) || (effective\_X == 9'd26 && effective\_Y == 8'd20) || (effective\_X == 9'd26 && effective\_Y == 8'd21) || (effective\_X == 9'd26 && effective\_Y == 8'd22) || (effective\_X == 9'd26 && effective\_Y == 8'd23) || (effective\_X == 9'd26 && effective\_Y == 8'd24) || (effective\_X == 9'd26 && effective\_Y == 8'd25) || (effective\_X == 9'd26 && effective\_Y == 8'd26) || (effective\_X == 9'd26 && effective\_Y == 8'd27) || (effective\_X == 9'd26 && effective\_Y == 8'd28) || (effective\_X == 9'd26 && effective\_Y == 8'd29) || (effective\_X == 9'd26 && effective\_Y == 8'd30) || (effective\_X == 9'd26 && effective\_Y == 8'd31) || (effective\_X == 9'd26 && effective\_Y == 8'd32) || (effective\_X == 9'd26 && effective\_Y == 8'd33) || (effective\_X == 9'd26 && effective\_Y == 8'd34) || (effective\_X == 9'd26 && effective\_Y == 8'd35) || (effective\_X == 9'd26 && effective\_Y == 8'd36) || (effective\_X == 9'd26 && effective\_Y == 8'd37) || (effective\_X == 9'd26 && effective\_Y == 8'd38) ||

(effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) || (effective\_X == 9'd29 && effective\_Y == 8'd29) || (effective\_X == 9'd29 && effective\_Y == 8'd30) || (effective\_X == 9'd29 && effective\_Y == 8'd31) || (effective\_X == 9'd29 && effective\_Y == 8'd32) || (effective\_X == 9'd29 && effective\_Y == 8'd33) || (effective\_X == 9'd29 && effective\_Y == 8'd34) || (effective\_X == 9'd29 && effective\_Y == 8'd35) || (effective\_X == 9'd29 && effective\_Y == 8'd36) || (effective\_X == 9'd29 && effective\_Y == 8'd37) || (effective\_X == 9'd29 && effective\_Y == 8'd38) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) || (effective\_X == 9'd30 && effective\_Y == 8'd29) || (effective\_X == 9'd30 && effective\_Y == 8'd30) || (effective\_X == 9'd30 && effective\_Y == 8'd31) || (effective\_X == 9'd30 && effective\_Y == 8'd32) || (effective\_X == 9'd30 && effective\_Y == 8'd33) || (effective\_X == 9'd30 && effective\_Y == 8'd34) || (effective\_X == 9'd30 && effective\_Y == 8'd35) || (effective\_X == 9'd30 && effective\_Y == 8'd36) || (effective\_X == 9'd30 && effective\_Y == 8'd37) || (effective\_X == 9'd30 && effective\_Y == 8'd38) ||

(effective\_X == 9'd31 && effective\_Y == 8'd18) || (effective\_X == 9'd31 && effective\_Y == 8'd19) || (effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) || (effective\_X == 9'd31 && effective\_Y == 8'd37) || (effective\_X == 9'd31 && effective\_Y == 8'd38) ||

(effective\_X == 9'd32 && effective\_Y == 8'd18) || (effective\_X == 9'd32 && effective\_Y == 8'd19) || (effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) || (effective\_X == 9'd32 && effective\_Y == 8'd37) || (effective\_X == 9'd32 && effective\_Y == 8'd38) ||

(effective\_X == 9'd33 && effective\_Y == 8'd18) || (effective\_X == 9'd33 && effective\_Y == 8'd19) || (effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) || (effective\_X == 9'd33 && effective\_Y == 8'd37) || (effective\_X == 9'd33 && effective\_Y == 8'd38) ||

(effective\_X == 9'd34 && effective\_Y == 8'd18) || (effective\_X == 9'd34 && effective\_Y == 8'd19) || (effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) || (effective\_X == 9'd34 && effective\_Y == 8'd37) || (effective\_X == 9'd34 && effective\_Y == 8'd38) ||

(effective\_X == 9'd35 && effective\_Y == 8'd18) || (effective\_X == 9'd35 && effective\_Y == 8'd19) || (effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) || (effective\_X == 9'd35 && effective\_Y == 8'd37) || (effective\_X == 9'd35 && effective\_Y == 8'd38) ||

(effective\_X == 9'd36 && effective\_Y == 8'd18) || (effective\_X == 9'd36 && effective\_Y == 8'd19) || (effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) || (effective\_X == 9'd36 && effective\_Y == 8'd37) || (effective\_X == 9'd36 && effective\_Y == 8'd38) ||

(effective\_X == 9'd37 && effective\_Y == 8'd18) || (effective\_X == 9'd37 && effective\_Y == 8'd19) || (effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) || (effective\_X == 9'd37 && effective\_Y == 8'd37) || (effective\_X == 9'd37 && effective\_Y == 8'd38) ||

(effective\_X == 9'd38 && effective\_Y == 8'd18) || (effective\_X == 9'd38 && effective\_Y == 8'd19) || (effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) || (effective\_X == 9'd38 && effective\_Y == 8'd37) || (effective\_X == 9'd38 && effective\_Y == 8'd38) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) ||

(effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) ||

(effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) ||

(effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) ||

(effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) ||

(effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) ||

(effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) ||

(effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) ||

(effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[9:7]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[9:7])) : 3'b111;

end

end

if (gameBoard\_cur\_Value == 12'd2048) begin

if((effective\_X == 9'd1 && effective\_Y == 8'd18) || (effective\_X == 9'd1 && effective\_Y == 8'd19) || (effective\_X == 9'd1 && effective\_Y == 8'd27) || (effective\_X == 9'd1 && effective\_Y == 8'd28) || (effective\_X == 9'd1 && effective\_Y == 8'd29) || (effective\_X == 9'd1 && effective\_Y == 8'd30) || (effective\_X == 9'd1 && effective\_Y == 8'd31) || (effective\_X == 9'd1 && effective\_Y == 8'd32) || (effective\_X == 9'd1 && effective\_Y == 8'd33) || (effective\_X == 9'd1 && effective\_Y == 8'd34) || (effective\_X == 9'd1 && effective\_Y == 8'd35) || (effective\_X == 9'd1 && effective\_Y == 8'd36) || (effective\_X == 9'd1 && effective\_Y == 8'd37) || (effective\_X == 9'd1 && effective\_Y == 8'd38) ||

(effective\_X == 9'd2 && effective\_Y == 8'd18) || (effective\_X == 9'd2 && effective\_Y == 8'd19) || (effective\_X == 9'd2 && effective\_Y == 8'd27) || (effective\_X == 9'd2 && effective\_Y == 8'd28) || (effective\_X == 9'd2 && effective\_Y == 8'd29) || (effective\_X == 9'd2 && effective\_Y == 8'd30) || (effective\_X == 9'd2 && effective\_Y == 8'd31) || (effective\_X == 9'd2 && effective\_Y == 8'd32) || (effective\_X == 9'd2 && effective\_Y == 8'd33) || (effective\_X == 9'd2 && effective\_Y == 8'd34) || (effective\_X == 9'd2 && effective\_Y == 8'd35) || (effective\_X == 9'd2 && effective\_Y == 8'd36) || (effective\_X == 9'd2 && effective\_Y == 8'd37) || (effective\_X == 9'd2 && effective\_Y == 8'd38) ||

(effective\_X == 9'd3 && effective\_Y == 8'd18) || (effective\_X == 9'd3 && effective\_Y == 8'd19) || (effective\_X == 9'd3 && effective\_Y == 8'd27) || (effective\_X == 9'd3 && effective\_Y == 8'd28) || (effective\_X == 9'd3 && effective\_Y == 8'd37) || (effective\_X == 9'd3 && effective\_Y == 8'd38) ||

(effective\_X == 9'd4 && effective\_Y == 8'd18) || (effective\_X == 9'd4 && effective\_Y == 8'd19) || (effective\_X == 9'd4 && effective\_Y == 8'd27) || (effective\_X == 9'd4 && effective\_Y == 8'd28) || (effective\_X == 9'd4 && effective\_Y == 8'd37) || (effective\_X == 9'd4 && effective\_Y == 8'd38) ||

(effective\_X == 9'd5 && effective\_Y == 8'd18) || (effective\_X == 9'd5 && effective\_Y == 8'd19) || (effective\_X == 9'd5 && effective\_Y == 8'd27) || (effective\_X == 9'd5 && effective\_Y == 8'd28) || (effective\_X == 9'd5 && effective\_Y == 8'd37) || (effective\_X == 9'd5 && effective\_Y == 8'd38) ||

(effective\_X == 9'd6 && effective\_Y == 8'd18) || (effective\_X == 9'd6 && effective\_Y == 8'd19) || (effective\_X == 9'd6 && effective\_Y == 8'd27) || (effective\_X == 9'd6 && effective\_Y == 8'd28) || (effective\_X == 9'd6 && effective\_Y == 8'd37) || (effective\_X == 9'd6 && effective\_Y == 8'd38) ||

(effective\_X == 9'd7 && effective\_Y == 8'd18) || (effective\_X == 9'd7 && effective\_Y == 8'd19) || (effective\_X == 9'd7 && effective\_Y == 8'd27) || (effective\_X == 9'd7 && effective\_Y == 8'd28) || (effective\_X == 9'd7 && effective\_Y == 8'd37) || (effective\_X == 9'd7 && effective\_Y == 8'd38) ||

(effective\_X == 9'd8 && effective\_Y == 8'd18) || (effective\_X == 9'd8 && effective\_Y == 8'd19) || (effective\_X == 9'd8 && effective\_Y == 8'd27) || (effective\_X == 9'd8 && effective\_Y == 8'd28) || (effective\_X == 9'd8 && effective\_Y == 8'd37) || (effective\_X == 9'd8 && effective\_Y == 8'd38) ||

(effective\_X == 9'd9 && effective\_Y == 8'd18) || (effective\_X == 9'd9 && effective\_Y == 8'd19) || (effective\_X == 9'd9 && effective\_Y == 8'd27) || (effective\_X == 9'd9 && effective\_Y == 8'd28) || (effective\_X == 9'd9 && effective\_Y == 8'd37) || (effective\_X == 9'd9 && effective\_Y == 8'd38) ||

(effective\_X == 9'd10 && effective\_Y == 8'd18) || (effective\_X == 9'd10 && effective\_Y == 8'd19) || (effective\_X == 9'd10 && effective\_Y == 8'd27) || (effective\_X == 9'd10 && effective\_Y == 8'd28) || (effective\_X == 9'd10 && effective\_Y == 8'd37) || (effective\_X == 9'd10 && effective\_Y == 8'd38) ||

(effective\_X == 9'd11 && effective\_Y == 8'd18) || (effective\_X == 9'd11 && effective\_Y == 8'd19) || (effective\_X == 9'd11 && effective\_Y == 8'd20) || (effective\_X == 9'd11 && effective\_Y == 8'd21) || (effective\_X == 9'd11 && effective\_Y == 8'd22) || (effective\_X == 9'd11 && effective\_Y == 8'd23) || (effective\_X == 9'd11 && effective\_Y == 8'd24) || (effective\_X == 9'd11 && effective\_Y == 8'd25) || (effective\_X == 9'd11 && effective\_Y == 8'd26) || (effective\_X == 9'd11 && effective\_Y == 8'd27) || (effective\_X == 9'd11 && effective\_Y == 8'd28) || (effective\_X == 9'd11 && effective\_Y == 8'd37) || (effective\_X == 9'd11 && effective\_Y == 8'd38) ||

(effective\_X == 9'd12 && effective\_Y == 8'd18) || (effective\_X == 9'd12 && effective\_Y == 8'd19) || (effective\_X == 9'd12 && effective\_Y == 8'd20) || (effective\_X == 9'd12 && effective\_Y == 8'd21) || (effective\_X == 9'd12 && effective\_Y == 8'd22) || (effective\_X == 9'd12 && effective\_Y == 8'd23) || (effective\_X == 9'd12 && effective\_Y == 8'd24) || (effective\_X == 9'd12 && effective\_Y == 8'd25) || (effective\_X == 9'd12 && effective\_Y == 8'd26) || (effective\_X == 9'd12 && effective\_Y == 8'd27) || (effective\_X == 9'd12 && effective\_Y == 8'd28) || (effective\_X == 9'd12 && effective\_Y == 8'd37) || (effective\_X == 9'd12 && effective\_Y == 8'd38) ||

(effective\_X == 9'd15 && effective\_Y == 8'd18) || (effective\_X == 9'd15 && effective\_Y == 8'd19) || (effective\_X == 9'd15 && effective\_Y == 8'd20) || (effective\_X == 9'd15 && effective\_Y == 8'd21) || (effective\_X == 9'd15 && effective\_Y == 8'd22) || (effective\_X == 9'd15 && effective\_Y == 8'd23) || (effective\_X == 9'd15 && effective\_Y == 8'd24) || (effective\_X == 9'd15 && effective\_Y == 8'd25) || (effective\_X == 9'd15 && effective\_Y == 8'd26) || (effective\_X == 9'd15 && effective\_Y == 8'd27) || (effective\_X == 9'd15 && effective\_Y == 8'd28) || (effective\_X == 9'd15 && effective\_Y == 8'd29) || (effective\_X == 9'd15 && effective\_Y == 8'd30) || (effective\_X == 9'd15 && effective\_Y == 8'd31) || (effective\_X == 9'd15 && effective\_Y == 8'd32) || (effective\_X == 9'd15 && effective\_Y == 8'd33) || (effective\_X == 9'd15 && effective\_Y == 8'd34) || (effective\_X == 9'd15 && effective\_Y == 8'd35) || (effective\_X == 9'd15 && effective\_Y == 8'd36) || (effective\_X == 9'd15 && effective\_Y == 8'd37) || (effective\_X == 9'd15 && effective\_Y == 8'd38) ||

(effective\_X == 9'd16 && effective\_Y == 8'd18) || (effective\_X == 9'd16 && effective\_Y == 8'd19) || (effective\_X == 9'd16 && effective\_Y == 8'd20) || (effective\_X == 9'd16 && effective\_Y == 8'd21) || (effective\_X == 9'd16 && effective\_Y == 8'd22) || (effective\_X == 9'd16 && effective\_Y == 8'd23) || (effective\_X == 9'd16 && effective\_Y == 8'd24) || (effective\_X == 9'd16 && effective\_Y == 8'd25) || (effective\_X == 9'd16 && effective\_Y == 8'd26) || (effective\_X == 9'd16 && effective\_Y == 8'd27) || (effective\_X == 9'd16 && effective\_Y == 8'd28) || (effective\_X == 9'd16 && effective\_Y == 8'd29) || (effective\_X == 9'd16 && effective\_Y == 8'd30) || (effective\_X == 9'd16 && effective\_Y == 8'd31) || (effective\_X == 9'd16 && effective\_Y == 8'd32) || (effective\_X == 9'd16 && effective\_Y == 8'd33) || (effective\_X == 9'd16 && effective\_Y == 8'd34) || (effective\_X == 9'd16 && effective\_Y == 8'd35) || (effective\_X == 9'd16 && effective\_Y == 8'd36) || (effective\_X == 9'd16 && effective\_Y == 8'd37) || (effective\_X == 9'd16 && effective\_Y == 8'd38) ||

(effective\_X == 9'd17 && effective\_Y == 8'd18) || (effective\_X == 9'd17 && effective\_Y == 8'd19) || (effective\_X == 9'd17 && effective\_Y == 8'd37) || (effective\_X == 9'd17 && effective\_Y == 8'd38) ||

(effective\_X == 9'd18 && effective\_Y == 8'd18) || (effective\_X == 9'd18 && effective\_Y == 8'd19) || (effective\_X == 9'd18 && effective\_Y == 8'd37) || (effective\_X == 9'd18 && effective\_Y == 8'd38) ||

(effective\_X == 9'd19 && effective\_Y == 8'd18) || (effective\_X == 9'd19 && effective\_Y == 8'd19) || (effective\_X == 9'd19 && effective\_Y == 8'd37) || (effective\_X == 9'd19 && effective\_Y == 8'd38) ||

(effective\_X == 9'd20 && effective\_Y == 8'd18) || (effective\_X == 9'd20 && effective\_Y == 8'd19) || (effective\_X == 9'd20 && effective\_Y == 8'd37) || (effective\_X == 9'd20 && effective\_Y == 8'd38) ||

(effective\_X == 9'd21 && effective\_Y == 8'd18) || (effective\_X == 9'd21 && effective\_Y == 8'd19) || (effective\_X == 9'd21 && effective\_Y == 8'd37) || (effective\_X == 9'd21 && effective\_Y == 8'd38) ||

(effective\_X == 9'd22 && effective\_Y == 8'd18) || (effective\_X == 9'd22 && effective\_Y == 8'd19) || (effective\_X == 9'd22 && effective\_Y == 8'd37) || (effective\_X == 9'd22 && effective\_Y == 8'd38) ||

(effective\_X == 9'd23 && effective\_Y == 8'd18) || (effective\_X == 9'd23 && effective\_Y == 8'd19) || (effective\_X == 9'd23 && effective\_Y == 8'd37) || (effective\_X == 9'd23 && effective\_Y == 8'd38) ||

(effective\_X == 9'd24 && effective\_Y == 8'd18) || (effective\_X == 9'd24 && effective\_Y == 8'd19) || (effective\_X == 9'd24 && effective\_Y == 8'd37) || (effective\_X == 9'd24 && effective\_Y == 8'd38) ||

(effective\_X == 9'd25 && effective\_Y == 8'd18) || (effective\_X == 9'd25 && effective\_Y == 8'd19) || (effective\_X == 9'd25 && effective\_Y == 8'd20) || (effective\_X == 9'd25 && effective\_Y == 8'd21) || (effective\_X == 9'd25 && effective\_Y == 8'd22) || (effective\_X == 9'd25 && effective\_Y == 8'd23) || (effective\_X == 9'd25 && effective\_Y == 8'd24) || (effective\_X == 9'd25 && effective\_Y == 8'd25) || (effective\_X == 9'd25 && effective\_Y == 8'd26) || (effective\_X == 9'd25 && effective\_Y == 8'd27) || (effective\_X == 9'd25 && effective\_Y == 8'd28) || (effective\_X == 9'd25 && effective\_Y == 8'd29) || (effective\_X == 9'd25 && effective\_Y == 8'd30) || (effective\_X == 9'd25 && effective\_Y == 8'd31) || (effective\_X == 9'd25 && effective\_Y == 8'd32) || (effective\_X == 9'd25 && effective\_Y == 8'd33) || (effective\_X == 9'd25 && effective\_Y == 8'd34) || (effective\_X == 9'd25 && effective\_Y == 8'd35) || (effective\_X == 9'd25 && effective\_Y == 8'd36) || (effective\_X == 9'd25 && effective\_Y == 8'd37) || (effective\_X == 9'd25 && effective\_Y == 8'd38) ||

(effective\_X == 9'd26 && effective\_Y == 8'd18) || (effective\_X == 9'd26 && effective\_Y == 8'd19) || (effective\_X == 9'd26 && effective\_Y == 8'd20) || (effective\_X == 9'd26 && effective\_Y == 8'd21) || (effective\_X == 9'd26 && effective\_Y == 8'd22) || (effective\_X == 9'd26 && effective\_Y == 8'd23) || (effective\_X == 9'd26 && effective\_Y == 8'd24) || (effective\_X == 9'd26 && effective\_Y == 8'd25) || (effective\_X == 9'd26 && effective\_Y == 8'd26) || (effective\_X == 9'd26 && effective\_Y == 8'd27) || (effective\_X == 9'd26 && effective\_Y == 8'd28) || (effective\_X == 9'd26 && effective\_Y == 8'd29) || (effective\_X == 9'd26 && effective\_Y == 8'd30) || (effective\_X == 9'd26 && effective\_Y == 8'd31) || (effective\_X == 9'd26 && effective\_Y == 8'd32) || (effective\_X == 9'd26 && effective\_Y == 8'd33) || (effective\_X == 9'd26 && effective\_Y == 8'd34) || (effective\_X == 9'd26 && effective\_Y == 8'd35) || (effective\_X == 9'd26 && effective\_Y == 8'd36) || (effective\_X == 9'd26 && effective\_Y == 8'd37) || (effective\_X == 9'd26 && effective\_Y == 8'd38) ||

(effective\_X == 9'd29 && effective\_Y == 8'd18) || (effective\_X == 9'd29 && effective\_Y == 8'd19) || (effective\_X == 9'd29 && effective\_Y == 8'd20) || (effective\_X == 9'd29 && effective\_Y == 8'd21) || (effective\_X == 9'd29 && effective\_Y == 8'd22) || (effective\_X == 9'd29 && effective\_Y == 8'd23) || (effective\_X == 9'd29 && effective\_Y == 8'd24) || (effective\_X == 9'd29 && effective\_Y == 8'd25) || (effective\_X == 9'd29 && effective\_Y == 8'd26) || (effective\_X == 9'd29 && effective\_Y == 8'd27) || (effective\_X == 9'd29 && effective\_Y == 8'd28) ||

(effective\_X == 9'd30 && effective\_Y == 8'd18) || (effective\_X == 9'd30 && effective\_Y == 8'd19) || (effective\_X == 9'd30 && effective\_Y == 8'd20) || (effective\_X == 9'd30 && effective\_Y == 8'd21) || (effective\_X == 9'd30 && effective\_Y == 8'd22) || (effective\_X == 9'd30 && effective\_Y == 8'd23) || (effective\_X == 9'd30 && effective\_Y == 8'd24) || (effective\_X == 9'd30 && effective\_Y == 8'd25) || (effective\_X == 9'd30 && effective\_Y == 8'd26) || (effective\_X == 9'd30 && effective\_Y == 8'd27) || (effective\_X == 9'd30 && effective\_Y == 8'd28) ||

(effective\_X == 9'd31 && effective\_Y == 8'd27) || (effective\_X == 9'd31 && effective\_Y == 8'd28) ||

(effective\_X == 9'd32 && effective\_Y == 8'd27) || (effective\_X == 9'd32 && effective\_Y == 8'd28) ||

(effective\_X == 9'd33 && effective\_Y == 8'd27) || (effective\_X == 9'd33 && effective\_Y == 8'd28) ||

(effective\_X == 9'd34 && effective\_Y == 8'd27) || (effective\_X == 9'd34 && effective\_Y == 8'd28) ||

(effective\_X == 9'd35 && effective\_Y == 8'd27) || (effective\_X == 9'd35 && effective\_Y == 8'd28) ||

(effective\_X == 9'd36 && effective\_Y == 8'd27) || (effective\_X == 9'd36 && effective\_Y == 8'd28) ||

(effective\_X == 9'd37 && effective\_Y == 8'd27) || (effective\_X == 9'd37 && effective\_Y == 8'd28) ||

(effective\_X == 9'd38 && effective\_Y == 8'd27) || (effective\_X == 9'd38 && effective\_Y == 8'd28) ||

(effective\_X == 9'd39 && effective\_Y == 8'd18) || (effective\_X == 9'd39 && effective\_Y == 8'd19) || (effective\_X == 9'd39 && effective\_Y == 8'd20) || (effective\_X == 9'd39 && effective\_Y == 8'd21) || (effective\_X == 9'd39 && effective\_Y == 8'd22) || (effective\_X == 9'd39 && effective\_Y == 8'd23) || (effective\_X == 9'd39 && effective\_Y == 8'd24) || (effective\_X == 9'd39 && effective\_Y == 8'd25) || (effective\_X == 9'd39 && effective\_Y == 8'd26) || (effective\_X == 9'd39 && effective\_Y == 8'd27) || (effective\_X == 9'd39 && effective\_Y == 8'd28) || (effective\_X == 9'd39 && effective\_Y == 8'd29) || (effective\_X == 9'd39 && effective\_Y == 8'd30) || (effective\_X == 9'd39 && effective\_Y == 8'd31) || (effective\_X == 9'd39 && effective\_Y == 8'd32) || (effective\_X == 9'd39 && effective\_Y == 8'd33) || (effective\_X == 9'd39 && effective\_Y == 8'd34) || (effective\_X == 9'd39 && effective\_Y == 8'd35) || (effective\_X == 9'd39 && effective\_Y == 8'd36) || (effective\_X == 9'd39 && effective\_Y == 8'd37) || (effective\_X == 9'd39 && effective\_Y == 8'd38) ||

(effective\_X == 9'd40 && effective\_Y == 8'd18) || (effective\_X == 9'd40 && effective\_Y == 8'd19) || (effective\_X == 9'd40 && effective\_Y == 8'd20) || (effective\_X == 9'd40 && effective\_Y == 8'd21) || (effective\_X == 9'd40 && effective\_Y == 8'd22) || (effective\_X == 9'd40 && effective\_Y == 8'd23) || (effective\_X == 9'd40 && effective\_Y == 8'd24) || (effective\_X == 9'd40 && effective\_Y == 8'd25) || (effective\_X == 9'd40 && effective\_Y == 8'd26) || (effective\_X == 9'd40 && effective\_Y == 8'd27) || (effective\_X == 9'd40 && effective\_Y == 8'd28) || (effective\_X == 9'd40 && effective\_Y == 8'd29) || (effective\_X == 9'd40 && effective\_Y == 8'd30) || (effective\_X == 9'd40 && effective\_Y == 8'd31) || (effective\_X == 9'd40 && effective\_Y == 8'd32) || (effective\_X == 9'd40 && effective\_Y == 8'd33) || (effective\_X == 9'd40 && effective\_Y == 8'd34) || (effective\_X == 9'd40 && effective\_Y == 8'd35) || (effective\_X == 9'd40 && effective\_Y == 8'd36) || (effective\_X == 9'd40 && effective\_Y == 8'd37) || (effective\_X == 9'd40 && effective\_Y == 8'd38) ||

(effective\_X == 9'd43 && effective\_Y == 8'd18) || (effective\_X == 9'd43 && effective\_Y == 8'd19) || (effective\_X == 9'd43 && effective\_Y == 8'd20) || (effective\_X == 9'd43 && effective\_Y == 8'd21) || (effective\_X == 9'd43 && effective\_Y == 8'd22) || (effective\_X == 9'd43 && effective\_Y == 8'd23) || (effective\_X == 9'd43 && effective\_Y == 8'd24) || (effective\_X == 9'd43 && effective\_Y == 8'd25) || (effective\_X == 9'd43 && effective\_Y == 8'd26) || (effective\_X == 9'd43 && effective\_Y == 8'd27) || (effective\_X == 9'd43 && effective\_Y == 8'd28) || (effective\_X == 9'd43 && effective\_Y == 8'd29) || (effective\_X == 9'd43 && effective\_Y == 8'd30) || (effective\_X == 9'd43 && effective\_Y == 8'd31) || (effective\_X == 9'd43 && effective\_Y == 8'd32) || (effective\_X == 9'd43 && effective\_Y == 8'd33) || (effective\_X == 9'd43 && effective\_Y == 8'd34) || (effective\_X == 9'd43 && effective\_Y == 8'd35) || (effective\_X == 9'd43 && effective\_Y == 8'd36) || (effective\_X == 9'd43 && effective\_Y == 8'd37) || (effective\_X == 9'd43 && effective\_Y == 8'd38) ||

(effective\_X == 9'd44 && effective\_Y == 8'd18) || (effective\_X == 9'd44 && effective\_Y == 8'd19) || (effective\_X == 9'd44 && effective\_Y == 8'd20) || (effective\_X == 9'd44 && effective\_Y == 8'd21) || (effective\_X == 9'd44 && effective\_Y == 8'd22) || (effective\_X == 9'd44 && effective\_Y == 8'd23) || (effective\_X == 9'd44 && effective\_Y == 8'd24) || (effective\_X == 9'd44 && effective\_Y == 8'd25) || (effective\_X == 9'd44 && effective\_Y == 8'd26) || (effective\_X == 9'd44 && effective\_Y == 8'd27) || (effective\_X == 9'd44 && effective\_Y == 8'd28) || (effective\_X == 9'd44 && effective\_Y == 8'd29) || (effective\_X == 9'd44 && effective\_Y == 8'd30) || (effective\_X == 9'd44 && effective\_Y == 8'd31) || (effective\_X == 9'd44 && effective\_Y == 8'd32) || (effective\_X == 9'd44 && effective\_Y == 8'd33) || (effective\_X == 9'd44 && effective\_Y == 8'd34) || (effective\_X == 9'd44 && effective\_Y == 8'd35) || (effective\_X == 9'd44 && effective\_Y == 8'd36) || (effective\_X == 9'd44 && effective\_Y == 8'd37) || (effective\_X == 9'd44 && effective\_Y == 8'd38) ||

(effective\_X == 9'd45 && effective\_Y == 8'd18) || (effective\_X == 9'd45 && effective\_Y == 8'd19) || (effective\_X == 9'd45 && effective\_Y == 8'd27) || (effective\_X == 9'd45 && effective\_Y == 8'd28) || (effective\_X == 9'd45 && effective\_Y == 8'd37) || (effective\_X == 9'd45 && effective\_Y == 8'd38) ||

(effective\_X == 9'd46 && effective\_Y == 8'd18) || (effective\_X == 9'd46 && effective\_Y == 8'd19) || (effective\_X == 9'd46 && effective\_Y == 8'd27) || (effective\_X == 9'd46 && effective\_Y == 8'd28) || (effective\_X == 9'd46 && effective\_Y == 8'd37) || (effective\_X == 9'd46 && effective\_Y == 8'd38) ||

(effective\_X == 9'd47 && effective\_Y == 8'd18) || (effective\_X == 9'd47 && effective\_Y == 8'd19) || (effective\_X == 9'd47 && effective\_Y == 8'd27) || (effective\_X == 9'd47 && effective\_Y == 8'd28) || (effective\_X == 9'd47 && effective\_Y == 8'd37) || (effective\_X == 9'd47 && effective\_Y == 8'd38) ||

(effective\_X == 9'd48 && effective\_Y == 8'd18) || (effective\_X == 9'd48 && effective\_Y == 8'd19) || (effective\_X == 9'd48 && effective\_Y == 8'd27) || (effective\_X == 9'd48 && effective\_Y == 8'd28) || (effective\_X == 9'd48 && effective\_Y == 8'd37) || (effective\_X == 9'd48 && effective\_Y == 8'd38) ||

(effective\_X == 9'd49 && effective\_Y == 8'd18) || (effective\_X == 9'd49 && effective\_Y == 8'd19) || (effective\_X == 9'd49 && effective\_Y == 8'd27) || (effective\_X == 9'd49 && effective\_Y == 8'd28) || (effective\_X == 9'd49 && effective\_Y == 8'd37) || (effective\_X == 9'd49 && effective\_Y == 8'd38) ||

(effective\_X == 9'd50 && effective\_Y == 8'd18) || (effective\_X == 9'd50 && effective\_Y == 8'd19) || (effective\_X == 9'd50 && effective\_Y == 8'd27) || (effective\_X == 9'd50 && effective\_Y == 8'd28) || (effective\_X == 9'd50 && effective\_Y == 8'd37) || (effective\_X == 9'd50 && effective\_Y == 8'd38) ||

(effective\_X == 9'd51 && effective\_Y == 8'd18) || (effective\_X == 9'd51 && effective\_Y == 8'd19) || (effective\_X == 9'd51 && effective\_Y == 8'd27) || (effective\_X == 9'd51 && effective\_Y == 8'd28) || (effective\_X == 9'd51 && effective\_Y == 8'd37) || (effective\_X == 9'd51 && effective\_Y == 8'd38) ||

(effective\_X == 9'd52 && effective\_Y == 8'd18) || (effective\_X == 9'd52 && effective\_Y == 8'd19) || (effective\_X == 9'd52 && effective\_Y == 8'd27) || (effective\_X == 9'd52 && effective\_Y == 8'd28) || (effective\_X == 9'd52 && effective\_Y == 8'd37) || (effective\_X == 9'd52 && effective\_Y == 8'd38) ||

(effective\_X == 9'd53 && effective\_Y == 8'd18) || (effective\_X == 9'd53 && effective\_Y == 8'd19) || (effective\_X == 9'd53 && effective\_Y == 8'd20) || (effective\_X == 9'd53 && effective\_Y == 8'd21) || (effective\_X == 9'd53 && effective\_Y == 8'd22) || (effective\_X == 9'd53 && effective\_Y == 8'd23) || (effective\_X == 9'd53 && effective\_Y == 8'd24) || (effective\_X == 9'd53 && effective\_Y == 8'd25) || (effective\_X == 9'd53 && effective\_Y == 8'd26) || (effective\_X == 9'd53 && effective\_Y == 8'd27) || (effective\_X == 9'd53 && effective\_Y == 8'd28) || (effective\_X == 9'd53 && effective\_Y == 8'd29) || (effective\_X == 9'd53 && effective\_Y == 8'd30) || (effective\_X == 9'd53 && effective\_Y == 8'd31) || (effective\_X == 9'd53 && effective\_Y == 8'd32) || (effective\_X == 9'd53 && effective\_Y == 8'd33) || (effective\_X == 9'd53 && effective\_Y == 8'd34) || (effective\_X == 9'd53 && effective\_Y == 8'd35) || (effective\_X == 9'd53 && effective\_Y == 8'd36) || (effective\_X == 9'd53 && effective\_Y == 8'd37) || (effective\_X == 9'd53 && effective\_Y == 8'd38) ||

(effective\_X == 9'd54 && effective\_Y == 8'd18) || (effective\_X == 9'd54 && effective\_Y == 8'd19) || (effective\_X == 9'd54 && effective\_Y == 8'd20) || (effective\_X == 9'd54 && effective\_Y == 8'd21) || (effective\_X == 9'd54 && effective\_Y == 8'd22) || (effective\_X == 9'd54 && effective\_Y == 8'd23) || (effective\_X == 9'd54 && effective\_Y == 8'd24) || (effective\_X == 9'd54 && effective\_Y == 8'd25) || (effective\_X == 9'd54 && effective\_Y == 8'd26) || (effective\_X == 9'd54 && effective\_Y == 8'd27) || (effective\_X == 9'd54 && effective\_Y == 8'd28) || (effective\_X == 9'd54 && effective\_Y == 8'd29) || (effective\_X == 9'd54 && effective\_Y == 8'd30) || (effective\_X == 9'd54 && effective\_Y == 8'd31) || (effective\_X == 9'd54 && effective\_Y == 8'd32) || (effective\_X == 9'd54 && effective\_Y == 8'd33) || (effective\_X == 9'd54 && effective\_Y == 8'd34) || (effective\_X == 9'd54 && effective\_Y == 8'd35) || (effective\_X == 9'd54 && effective\_Y == 8'd36) || (effective\_X == 9'd54 && effective\_Y == 8'd37) || (effective\_X == 9'd54 && effective\_Y == 8'd38)

) begin

pixel\_colour = colourful ? (((randNum\_12b[10:8] ^ randNum\_12b[6:4]) == 3'b0) ? 3'b111 : (randNum\_12b[10:8] ^ randNum\_12b[6:4])) : 3'b111;

end

end

// if (gameBoard\_cur\_Value == 12'd4096) begin

// if(effective\_X == 6'd1 && effective\_Y == 6'd1 ||

// effective\_X == 6'd2 && effective\_Y == 6'd2 ||

// effective\_X == 6'd3 && effective\_Y == 6'd3 ||

// effective\_X == 6'd4 && effective\_Y == 6'd4 ||

// effective\_X == 6'd5 && effective\_Y == 6'd5 ||

// effective\_X == 6'd6 && effective\_Y == 6'd6 ||

// effective\_X == 6'd7 && effective\_Y == 6'd7 ||

// effective\_X == 6'd8 && effective\_Y == 6'd8 ||

// effective\_X == 6'd9 && effective\_Y == 6'd9 ||

// effective\_X == 6'd10 && effective\_Y == 6'd10 ||

// effective\_X == 6'd11 && effective\_Y == 6'd11 ||

// effective\_X == 6'd12 && effective\_Y == 6'd12) begin

// pixel\_colour = 3'b111;

// end

// end

end

end

end

if (sig\_drawRandNum) begin

rand\_eff\_X = ((rand\_X - 2'd3) - ((randomNum\_reg[3:2]) \* (6'd59)));

rand\_eff\_Y = ((rand\_Y - 2'd3) - ((randomNum\_reg[1:0]) \* (6'd59)));

// if ((rand\_eff\_X <= casc\_Counter) && (rand\_eff\_Y <= casc\_Counter)) begin

if((rand\_eff\_X == 9'd43 && rand\_eff\_Y == 8'd18) || (rand\_eff\_X == 9'd43 && rand\_eff\_Y == 8'd19) || (rand\_eff\_X == 9'd43 && rand\_eff\_Y == 8'd27) || (rand\_eff\_X == 9'd43 && rand\_eff\_Y == 8'd28) || (rand\_eff\_X == 9'd43 && rand\_eff\_Y == 8'd29) || (rand\_eff\_X == 9'd43 && rand\_eff\_Y == 8'd30) || (rand\_eff\_X == 9'd43 && rand\_eff\_Y == 8'd31) || (rand\_eff\_X == 9'd43 && rand\_eff\_Y == 8'd32) || (rand\_eff\_X == 9'd43 && rand\_eff\_Y == 8'd33) || (rand\_eff\_X == 9'd43 && rand\_eff\_Y == 8'd34) || (rand\_eff\_X == 9'd43 && rand\_eff\_Y == 8'd35) || (rand\_eff\_X == 9'd43 && rand\_eff\_Y == 8'd36) || (rand\_eff\_X == 9'd43 && rand\_eff\_Y == 8'd37) || (rand\_eff\_X == 9'd43 && rand\_eff\_Y == 8'd38) ||

(rand\_eff\_X == 9'd44 && rand\_eff\_Y == 8'd18) || (rand\_eff\_X == 9'd44 && rand\_eff\_Y == 8'd19) || (rand\_eff\_X == 9'd44 && rand\_eff\_Y == 8'd27) || (rand\_eff\_X == 9'd44 && rand\_eff\_Y == 8'd28) || (rand\_eff\_X == 9'd44 && rand\_eff\_Y == 8'd29) || (rand\_eff\_X == 9'd44 && rand\_eff\_Y == 8'd30) || (rand\_eff\_X == 9'd44 && rand\_eff\_Y == 8'd31) || (rand\_eff\_X == 9'd44 && rand\_eff\_Y == 8'd32) || (rand\_eff\_X == 9'd44 && rand\_eff\_Y == 8'd33) || (rand\_eff\_X == 9'd44 && rand\_eff\_Y == 8'd34) || (rand\_eff\_X == 9'd44 && rand\_eff\_Y == 8'd35) || (rand\_eff\_X == 9'd44 && rand\_eff\_Y == 8'd36) || (rand\_eff\_X == 9'd44 && rand\_eff\_Y == 8'd37) || (rand\_eff\_X == 9'd44 && rand\_eff\_Y == 8'd38) ||

(rand\_eff\_X == 9'd45 && rand\_eff\_Y == 8'd18) || (rand\_eff\_X == 9'd45 && rand\_eff\_Y == 8'd19) || (rand\_eff\_X == 9'd45 && rand\_eff\_Y == 8'd27) || (rand\_eff\_X == 9'd45 && rand\_eff\_Y == 8'd28) || (rand\_eff\_X == 9'd45 && rand\_eff\_Y == 8'd37) || (rand\_eff\_X == 9'd45 && rand\_eff\_Y == 8'd38) ||

(rand\_eff\_X == 9'd46 && rand\_eff\_Y == 8'd18) || (rand\_eff\_X == 9'd46 && rand\_eff\_Y == 8'd19) || (rand\_eff\_X == 9'd46 && rand\_eff\_Y == 8'd27) || (rand\_eff\_X == 9'd46 && rand\_eff\_Y == 8'd28) || (rand\_eff\_X == 9'd46 && rand\_eff\_Y == 8'd37) || (rand\_eff\_X == 9'd46 && rand\_eff\_Y == 8'd38) ||

(rand\_eff\_X == 9'd47 && rand\_eff\_Y == 8'd18) || (rand\_eff\_X == 9'd47 && rand\_eff\_Y == 8'd19) || (rand\_eff\_X == 9'd47 && rand\_eff\_Y == 8'd27) || (rand\_eff\_X == 9'd47 && rand\_eff\_Y == 8'd28) || (rand\_eff\_X == 9'd47 && rand\_eff\_Y == 8'd37) || (rand\_eff\_X == 9'd47 && rand\_eff\_Y == 8'd38) ||

(rand\_eff\_X == 9'd48 && rand\_eff\_Y == 8'd18) || (rand\_eff\_X == 9'd48 && rand\_eff\_Y == 8'd19) || (rand\_eff\_X == 9'd48 && rand\_eff\_Y == 8'd27) || (rand\_eff\_X == 9'd48 && rand\_eff\_Y == 8'd28) || (rand\_eff\_X == 9'd48 && rand\_eff\_Y == 8'd37) || (rand\_eff\_X == 9'd48 && rand\_eff\_Y == 8'd38) ||

(rand\_eff\_X == 9'd49 && rand\_eff\_Y == 8'd18) || (rand\_eff\_X == 9'd49 && rand\_eff\_Y == 8'd19) || (rand\_eff\_X == 9'd49 && rand\_eff\_Y == 8'd27) || (rand\_eff\_X == 9'd49 && rand\_eff\_Y == 8'd28) || (rand\_eff\_X == 9'd49 && rand\_eff\_Y == 8'd37) || (rand\_eff\_X == 9'd49 && rand\_eff\_Y == 8'd38) ||

(rand\_eff\_X == 9'd50 && rand\_eff\_Y == 8'd18) || (rand\_eff\_X == 9'd50 && rand\_eff\_Y == 8'd19) || (rand\_eff\_X == 9'd50 && rand\_eff\_Y == 8'd27) || (rand\_eff\_X == 9'd50 && rand\_eff\_Y == 8'd28) || (rand\_eff\_X == 9'd50 && rand\_eff\_Y == 8'd37) || (rand\_eff\_X == 9'd50 && rand\_eff\_Y == 8'd38) ||

(rand\_eff\_X == 9'd51 && rand\_eff\_Y == 8'd18) || (rand\_eff\_X == 9'd51 && rand\_eff\_Y == 8'd19) || (rand\_eff\_X == 9'd51 && rand\_eff\_Y == 8'd27) || (rand\_eff\_X == 9'd51 && rand\_eff\_Y == 8'd28) || (rand\_eff\_X == 9'd51 && rand\_eff\_Y == 8'd37) || (rand\_eff\_X == 9'd51 && rand\_eff\_Y == 8'd38) ||

(rand\_eff\_X == 9'd52 && rand\_eff\_Y == 8'd18) || (rand\_eff\_X == 9'd52 && rand\_eff\_Y == 8'd19) || (rand\_eff\_X == 9'd52 && rand\_eff\_Y == 8'd27) || (rand\_eff\_X == 9'd52 && rand\_eff\_Y == 8'd28) || (rand\_eff\_X == 9'd52 && rand\_eff\_Y == 8'd37) || (rand\_eff\_X == 9'd52 && rand\_eff\_Y == 8'd38) ||

(rand\_eff\_X == 9'd53 && rand\_eff\_Y == 8'd18) || (rand\_eff\_X == 9'd53 && rand\_eff\_Y == 8'd19) || (rand\_eff\_X == 9'd53 && rand\_eff\_Y == 8'd20) || (rand\_eff\_X == 9'd53 && rand\_eff\_Y == 8'd21) || (rand\_eff\_X == 9'd53 && rand\_eff\_Y == 8'd22) || (rand\_eff\_X == 9'd53 && rand\_eff\_Y == 8'd23) || (rand\_eff\_X == 9'd53 && rand\_eff\_Y == 8'd24) || (rand\_eff\_X == 9'd53 && rand\_eff\_Y == 8'd25) || (rand\_eff\_X == 9'd53 && rand\_eff\_Y == 8'd26) || (rand\_eff\_X == 9'd53 && rand\_eff\_Y == 8'd27) || (rand\_eff\_X == 9'd53 && rand\_eff\_Y == 8'd28) || (rand\_eff\_X == 9'd53 && rand\_eff\_Y == 8'd37) || (rand\_eff\_X == 9'd53 && rand\_eff\_Y == 8'd38) ||

(rand\_eff\_X == 9'd54 && rand\_eff\_Y == 8'd18) || (rand\_eff\_X == 9'd54 && rand\_eff\_Y == 8'd19) || (rand\_eff\_X == 9'd54 && rand\_eff\_Y == 8'd20) || (rand\_eff\_X == 9'd54 && rand\_eff\_Y == 8'd21) || (rand\_eff\_X == 9'd54 && rand\_eff\_Y == 8'd22) || (rand\_eff\_X == 9'd54 && rand\_eff\_Y == 8'd23) || (rand\_eff\_X == 9'd54 && rand\_eff\_Y == 8'd24) || (rand\_eff\_X == 9'd54 && rand\_eff\_Y == 8'd25) || (rand\_eff\_X == 9'd54 && rand\_eff\_Y == 8'd26) || (rand\_eff\_X == 9'd54 && rand\_eff\_Y == 8'd27) || (rand\_eff\_X == 9'd54 && rand\_eff\_Y == 8'd28) || (rand\_eff\_X == 9'd54 && rand\_eff\_Y == 8'd37) || (rand\_eff\_X == 9'd54 && rand\_eff\_Y == 8'd38)

) begin

rand\_colour = colourful ? (((randNum\_12b[2:0] ^ randNum\_12b[9:7]) == 3'b0) ? 3'b111 : (randNum\_12b[2:0] ^ randNum\_12b[9:7])) : 3'b111;

end

// end

end

end

// assign x = screen\_X;

// assign y = screen\_Y;

// assign colour = pixel\_colour;

initial begin

highscore <= 12'b0;

randomNum\_reg <= 4'b0;

move\_reg <= 4'b0;

iteration\_Counter <= 3'b0;

casc\_Counter <= 7'b0;

clearBoard\_Counter <= 5'b0;

displayBoard\_Counter <= 5'b0;

rand\_X <= 9'd0;

rand\_Y <= 8'd0;

randNum\_counter <= 7'b0;

sig\_randNum\_GOOD = 1'b0;

sig\_doneProcess = 1'b0;

sig\_toNoMove = 1'b0;

sig\_toMergeMove = 1'b0;

sig\_toJustMove = 1'b0;

sig\_nextIteration = 1'b0;

temp\_X = 2'b0;

temp\_Y = 2'b0;

temp\_iter\_counter = 3'b0;

sig\_drawBoard\_Cont = 1'b1;

sig\_doneCasc = 1'b0;

temp\_casc\_Counter = 7'b0;

temp\_highscore = 12'b0;

sig\_gameLose = 1'b0;

gameRAM\_Addr = 4'b0;

gameRAM\_DataIn = 12'd0;

sig\_clearBoard\_DONE = 1'b0;

sig\_drawBoard\_DONE = 1'b0;

sig\_debug\_displayBoard\_DONE = 1'b0;

sig\_randNumDraw\_DONE = 1'b0;

screen\_X <= 9'd0;

screen\_Y <= 8'd0;

pixel\_colour = 3'b000;

rand\_colour = 3'b000;

end

endmodule

module Linear\_FB\_Shift\_Reg\_5b(

input CLOCK\_50,

input resetn,

input LFBSR\_enable,

output reg [4:0] out

);

wire feedback;

assign feedback = ~(out[4] ^ out[2]);

always @(posedge CLOCK\_50, negedge resetn) begin

if (!resetn)

out = 5'b0;

else if (LFBSR\_enable) begin

out = {out[3:0],feedback};

end

end

endmodule

module Linear\_FB\_Shift\_Reg\_12b(

input CLOCK\_50,

input resetn,

input LFBSR\_enable,

output reg [11:0] out

);

wire feedback;

assign feedback = ~(out[11] ^ out[8] ^ out[7] ^ out[4]);

always @(posedge CLOCK\_50, negedge resetn) begin

if (!resetn)

out = 12'b101010101010;

else if (LFBSR\_enable) begin

out = {out[10:0],feedback};

end

end

endmodule

module counter\_4b(

input CLOCK\_50,

input resetn,

input counter\_4b\_enable,

output reg [3:0] out

);

always @(posedge CLOCK\_50, negedge resetn) begin

if (!resetn)

out = 4'b0;

else if (counter\_4b\_enable) begin

out = out + 1'b1;

end

end

endmodule

module hex\_decoder(hex\_digit, segments);

input [3:0] hex\_digit;

output reg [6:0] segments;

always @(\*)

case (hex\_digit)

4'h0: segments = 7'b100\_0000;

4'h1: segments = 7'b111\_1001;

4'h2: segments = 7'b010\_0100;

4'h3: segments = 7'b011\_0000;

4'h4: segments = 7'b001\_1001;

4'h5: segments = 7'b001\_0010;

4'h6: segments = 7'b000\_0010;

4'h7: segments = 7'b111\_1000;

4'h8: segments = 7'b000\_0000;

4'h9: segments = 7'b001\_1000;

4'hA: segments = 7'b000\_1000;

4'hB: segments = 7'b000\_0011;

4'hC: segments = 7'b100\_0110;

4'hD: segments = 7'b010\_0001;

4'hE: segments = 7'b000\_0110;

4'hF: segments = 7'b000\_1110;

default: segments = 7'h7f;

endcase

endmodule

module keyboard\_press\_driver(

input CLOCK\_50,

output reg valid, makeBreak,

output reg [7:0] outCode,

output reg [3:0] sig\_move,

output reg KEYBOARD\_ENTER,

output reg KEYBOARD\_RESET,

input PS2\_DAT, // PS2 data line

input PS2\_CLK, // PS2 clock line

input reset

);

parameter FIRST = 1'b0, SEENF0 = 1'b1;

reg state;

reg [1:0] count;

wire [7:0] scan\_code;

reg [7:0] filter\_scan;

wire scan\_ready;

reg read;

parameter NULL = 8'h00;

wire [7:0] ARROW\_UP = 8'h75; //codes for arrows

wire [7:0] ARROW\_DOWN = 8'h72;

wire [7:0] ARROW\_LEFT = 8'h6B;

wire [7:0] ARROW\_RIGHT = 8'h74;

wire [7:0] SPACEBAR = 8'h29;

wire [7:0] ESC = 8'h76;

wire [7:0] ENTER = 8'h5A;

initial

begin

state = FIRST;

filter\_scan = NULL;

read = 1'b0;

count = 2'b00;

end

// inner driver that handles the PS2 keyboard protocol

// outputs a scan\_ready signal accompanied with a new scan\_code

keyboard\_inner\_driver kbd(

.keyboard\_clk(PS2\_CLK),

.keyboard\_data(PS2\_DAT),

.clock50(CLOCK\_50),

.reset(reset),

.read(read),

.scan\_ready(scan\_ready),

.scan\_code(scan\_code)

);

always @(posedge CLOCK\_50) begin

case(count)

2'b00:

if(scan\_ready)

count <= 2'b01;

2'b01:

if(scan\_ready)

count <= 2'b10;

2'b10:

begin

read <= 1'b1;

count <= 2'b11;

valid <= 0;

outCode <= scan\_code;

case(state)

FIRST:

case(scan\_code)

8'hF0:

begin

state <= SEENF0;

end

8'hE0:

begin

state <= FIRST;

end

default:

begin

filter\_scan <= scan\_code;

if(filter\_scan != scan\_code)

begin

valid <= 1'b1;

makeBreak <= 1'b1;

end

end

endcase

SEENF0:

begin

state <= FIRST;

if(filter\_scan == scan\_code)

begin

filter\_scan <= NULL;

end

valid <= 1'b1;

makeBreak <= 1'b0;

end

endcase

end

2'b11:

begin

read <= 1'b0;

count <= 2'b00;

valid <= 0;

end

endcase

end

always @ (posedge CLOCK\_50) begin

sig\_move <= 4'b0;

KEYBOARD\_ENTER <= 1'b0;

KEYBOARD\_RESET <= 1'b0;

if (outCode == ARROW\_UP)

sig\_move[2] <= 1'b1 & makeBreak;

else if (outCode == ARROW\_DOWN)

sig\_move[1] <= 1'b1 & makeBreak;

else if (outCode == ARROW\_LEFT)

sig\_move[3] <= 1'b1 & makeBreak;

else if (outCode == ARROW\_RIGHT)

sig\_move[0] <= 1'b1 & makeBreak;

else if (outCode == ESC)

KEYBOARD\_RESET <= 1'b1 & makeBreak;

else if (outCode == SPACEBAR)

KEYBOARD\_RESET <= 1'b1 & makeBreak;

else if (outCode == ENTER)

KEYBOARD\_ENTER <= 1'b1 & makeBreak;

end

endmodule

module keyboard\_inner\_driver(keyboard\_clk, keyboard\_data, clock50, reset, read, scan\_ready, scan\_code);

input keyboard\_clk;

input keyboard\_data;

input clock50; // 50 Mhz system clock

input reset;

input read;

output scan\_ready;

output [7:0] scan\_code;

reg ready\_set;

reg [7:0] scan\_code;

reg scan\_ready;

reg read\_char;

reg clock; // 25 Mhz internal clock

reg [3:0] incnt;

reg [8:0] shiftin;

reg [7:0] filter;

reg keyboard\_clk\_filtered;

// scan\_ready is set to 1 when scan\_code is available.

// user should set read to 1 and then to 0 to clear scan\_ready

always @ (posedge ready\_set or posedge read)

if (read == 1) scan\_ready <= 0;

else scan\_ready <= 1;

// divide-by-two 50MHz to 25MHz

always @(posedge clock50)

clock <= ~clock;

// This process filters the raw clock signal coming from the keyboard

// using an eight-bit shift register and two AND gates

always @(posedge clock)

begin

filter <= {keyboard\_clk, filter[7:1]};

if (filter==8'b1111\_1111) keyboard\_clk\_filtered <= 1;

else if (filter==8'b0000\_0000) keyboard\_clk\_filtered <= 0;

end

// This process reads in serial data coming from the terminal

always @(posedge keyboard\_clk\_filtered)

begin

if (reset==1)

begin

incnt <= 4'b0000;

read\_char <= 0;

end

else if (keyboard\_data==0 && read\_char==0)

begin

read\_char <= 1;

ready\_set <= 0;

end

else

begin

// shift in next 8 data bits to assemble a scan code

if (read\_char == 1)

begin

if (incnt < 9)

begin

incnt <= incnt + 1'b1;

shiftin = { keyboard\_data, shiftin[8:1]};

ready\_set <= 0;

end

else

begin

incnt <= 0;

scan\_code <= shiftin[7:0];

read\_char <= 0;

ready\_set <= 1;

end

end

end

end

endmodule