

Exercises week 3

1 Moving particles

1. Draw twenty small circles next to each other horizontally on the screen and give them all a distinct colour.
2. Move the circles randomly (independently) across the screen by adding a random value to the position each frame.
3. Make sure they cannot go outside of the borders

2 Sorting numbers

1. Create an array with the numbers 4, 2, 7, 1, 3, 8.
2. Swap the first and the last element and print the resulting array.
3. Loop through the array and switch the current element and the next if the next variable is smaller than the current one.
4. Repeat this process until you have gone through the entire array without swapping. Use a boolean to keep track of this.
5. If it works, you have implemented a simple sorting algorithm. Convince yourself that it always sorts.

3 The hidden message

For this exercise you need the following two images: <http://liacs.leidenuniv.nl/~ruijlbjg/a.png> and <http://liacs.leidenuniv.nl/~ruijlbjg/b.png>. The images may appear to be the same, but there are some very subtle differences. These practically invisible colour differences are a message I have encoded for you. It is up to you to find the message. If the colour difference

in a pixel is 1 (remember a colour is an integer), it represents a whitespace. A colour difference in the range from 2 to 27 is the alphabet A ... Z.

1. Make an array that serves as the decryption alphabet. Make sure that each character is at the right index.
2. Load the images.
3. Go through the pixels, find the differences, and decode the message.

4 Level loading (Check assignment)

For this exercise, you need a text file that encodes a level of the game Sokoban. You can download it here: <http://liacs.leidenuniv.nl/~ruijlbjg/level.txt>. The layout is displayed in table 1.

| Symbol | Meaning |
|--------|-------------------|
| | Empty space |
| # | Wall |
| \$ | Crate |
| @ | Player |
| . | Crate destination |

Table 1: Layout

1. Load the level file using `loadStrings()`. What is the type that `loadStrings()` returns?
2. Each line is a `String`. You can get the character of string *s* at position *i* with *s.charAt(i)*. You can get the length with *s.length()*.
3. Draw the level, using the layout above. Make sure the player is a circle, and the walls are clearly distinct from the floor.
4. Create/find a nice image to serve as a texture for the walls.