

WORKSHEET W005

GRAPHICS

On large displays it would be a Sisyphos work to compose images from single pixels. In this task, you'll learn more powerful graphic commands that let you draw geometric shapes.

EXERCISE

Draw a house with the graphic commands. The columns (x) and rows (y) of the LED matrix are numbered consecutively from above left to bottom right.

X
0 1 2 3 4 5 6 7



HINT

Use the colour blocks to make the house more exciting.

LOGIC

Do forever 1x

MATRIX

Set pixel color x

Draw pixel x 0 y 0 x

Draw rectangle x 0 y 0 width 0 height 0 x

Draw line from x 0 y 0 to x 0 y 0 x

Draw triangle P1 x 0 y 0 P2 x 0 y 0 P2 x 0 y 0 x

TIME

Wait 1000 milliseconds 1x

PARTS LIST

LIST OF BLOCKS TO BE USED



LEVEL EASY

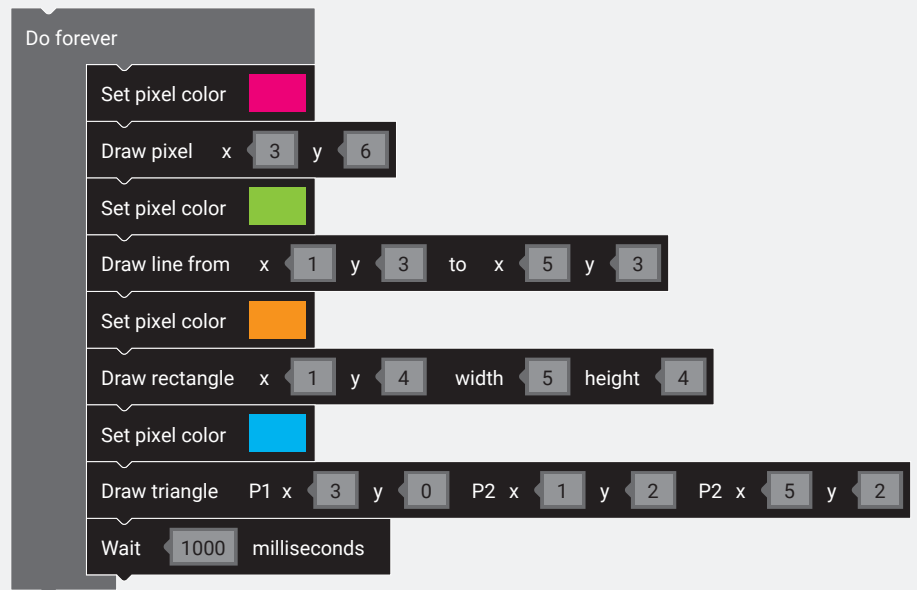
ADDITIONAL TASK:

Let a small square become bigger and bigger.

WORKSHEET W005 GRAPHICS

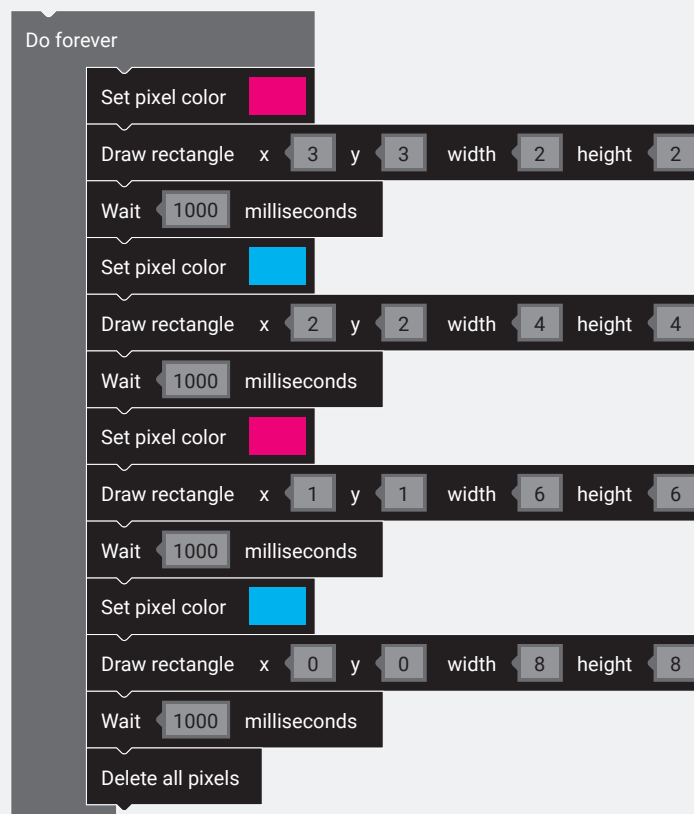
SOLUTION

PROPOSED SOLUTION



ADDITIONAL TASK

PROPOSED SOLUTION



WORKSHEET W005

GRAPHICS

Learning objective:

Capacity to understand the coordinate system of the LED matrix and the most common graphic commands.

WHAT TO DO

1. First the «Do forever» loop is needed again. All blocks must be positioned in this loop.
2. In the second step, the pre-programmed graphic commands of the Oxocard are used to draw the house. This is a much faster way to draw images generically than using the «Draw monochrome image» block.
3. Optionally, you can put «Set pixel color» blocks in front of each graphic command to make the house a little more diversified.
4. The last thing you need is a «Wait» block to prevent the drawing from going on continuously.

NEW COMMANDS

Draw triangle P1 x 0 y 0 P2 x 0 y 0 P2 x 0 y 0

In order to display a triangle on the matrix, the coordinates of the three corner points must be specified.

Draw circle x 0 y 0 radius 0

For the circle, the center point and radius must be defined.

Draw rectangle x 0 y 0 width 0 height 0

For rectangles, x and y define the upper left corner. The width and height are given in pixels from this point.

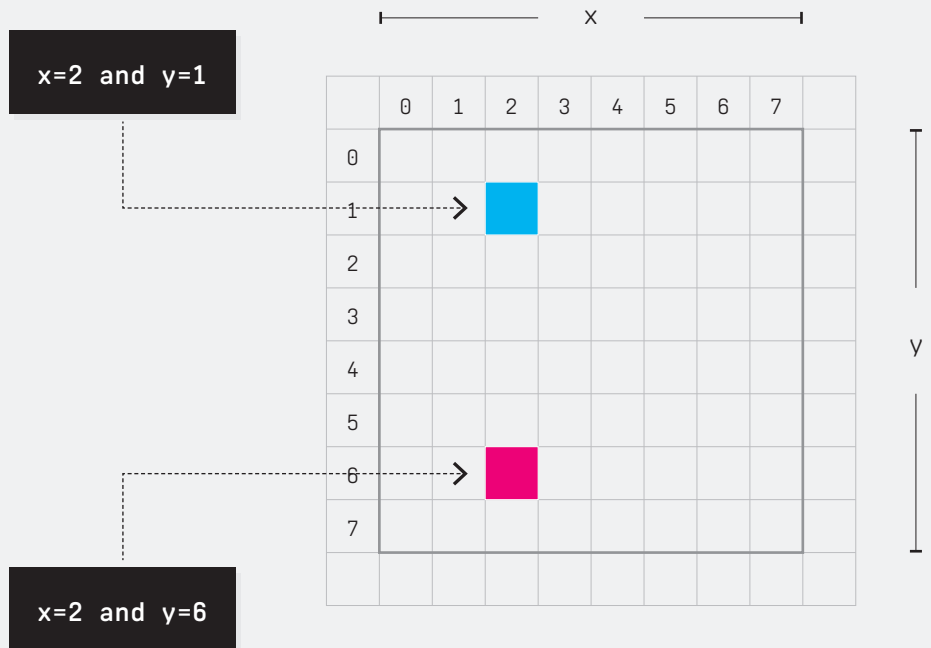
Draw line from x 0 y 0 to x 0 y 0

In the case of a line, the starting point is specified first, then the end point.

ADDITIONAL INFORMATION: X- AND Y-AXES

In computer graphics, it is common to use a zero indexed coordinate system with the x- and y-axes. «x» corresponds to the column from left to right and «y» to the rows from top to bottom. So the zero point is at the top left.

For a better understanding, here is an example: The blue dot is in the third row and the second column. Since counting starts from 0, this corresponds to the coordinates: x=2 and y=1.



WORKSHEET

W005

GRAPHICS

ADDITIONAL INFORMATION: ELEGANT PROGRAMMING

This task gives an example of a very important insight in the world of programming. Instead of „Draw monochrome image“ or „Draw pixel“ we used for example only „Draw rectangle“. This reduces the programming effort and increases the readability of the program.

With the newly learned graphic command, you can easily and elegantly program. With pixels you would need eight instead of just one command:

8 COMMANDS

```
Draw pixel x 0 y 0
Draw pixel x 0 y 1
Draw pixel x 0 y 2
Draw pixel x 1 y 2
Draw pixel x 1 y 0
Draw pixel x 2 y 0
Draw pixel x 2 y 1
Draw pixel x 2 y 2
```

1 COMMAND

```
Draw rectangle x 0 y 0 width 3 height 3
```