Exercises week 1

1 Swapping

Build a program that has two numbers, called a and b. a gets the value 4, and b gets the value 5.

1. What should be the type of a and b?

2. Print the values of a and b.

3. Swap a and b: give a the value of b and b the value of a, without using the actual values 4 and 5.

4. If you are having trouble with this, think about the possibility of using an *extra* variable.

2 Drawing

We are now going to draw a few objects. If you don't know how:

- Read up on how to draw.

- Read up on how to add colours.

- Read up on the list of functions.

First, make the screen 640 pixels wide and 640 pixels high with the *size* function. Now draw the following figures.

1. Draw a white background

2. Draw a circle in the middle of the screen

3. Draw a rectangle

4. Draw a house

5. Draw a banana (with the arc function perhaps)

6. Draw a smiley face

3 Moving eyes

First we do a warm-up exercise.

1. Draw a line from the middle of the screen to the cursor.

2. Now make sure the line ends halfway between the middle of the screen and the cursor.

3. Now make the line a fixed length, while still pointing to the cursor.

4. Draw a black dot at the end of the line.

Now start from the smiley face from the previous exercise. Make sure it has big eye sockets.

1. Draw big black pupils in the eye. We are going to make them point to the mouse cursor. This means that the center of the pupil should be close to the mouse, while making sure that the pupil does not leave the eye.

2. Calculate the distance between the mouse position and the middle of the eye (using dist() or by doing it yourself with Pythagoras)

3. Using this, you can calculate how far the center of the eye should move on the dashed line towards the mouse (see figure 1). You can do this without sine and cosine functions.

4. If you are having trouble with this, making a drawing helps. Additionally, just trying something helps, since you can see when you obtain the right result.

4 Animations (check assignment)

We are now going to write some basic animations. Think about the following two things: what are the variables that are changing? Where should I declare this variable?

1. Draw a circle centered in the middle of the screen and make sure that the circle edge always touches the mouse cursor

2. Draw a circle in the middle of the screen that grows

3. Draw a rectangle that moves from the left to the right of the screen

4. Draw a circle that moves from the left to the right of the screen and that grows

5. Draw a circle that moves in a circle around the center of the screen.
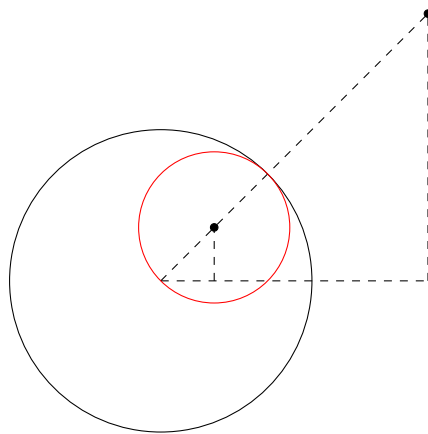
Figure 1: The circle of the pupil (red), in the eye. The goal is to calculate where the middle of the pupil should be (black dot). It should be somewhere on the dashed line, from the center of the eye to the mouse.