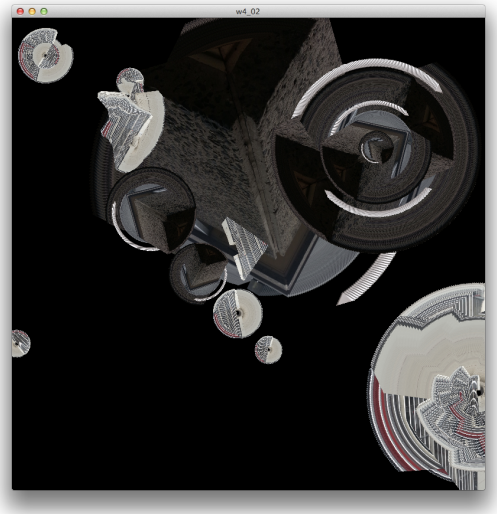
IMAGE BASICS IN PROCCESSING

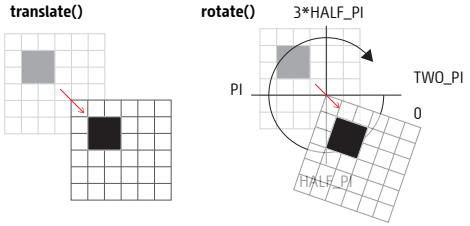


Transformations

These commands move, rotate, and scale the coordinate system. All graphic commands thereafter refer to this altered coordinate system.

translate(x, y)
Specifies an amount to displace objects within the display window. The x parameter specifies left/right translation, the y parameter specifies up/down translation.

pushMatrix() and popMatrix()
The pushMatrix() function saves the current coordinate system to the stack and popMatrix() restores the prior coordinate system. Use this to 'undo' transformations.



More information on
http://www.processing.org/tutorials/transform2d/

```
PImage[] myImage;
float scaleOfImage;
PImage bgImage;
int selectedImageNum;

void setup() {
 size(800, 800);

 myImage = new PImage[2];
 myImage[0] = loadImage("sample_01.png");
 myImage[1] = loadImage("sample_02.png");
 bgImage = createImage(width, height, RGB);
 scaleOfImage = 0.5;
 selectedImageNum = 0;
}

void draw() {
 background(bgImage);
 if ( keyPressed ) {
  if (keyCode == LEFT) {
   scaleOfImage -= 0.01;
  }else if (keyCode==RIGHT) {
   scaleOfImage += 0.01;
  }
 }

 pushMatrix();
 translate(mouseX, mouseY);
 float scaleValue = constrain(scaleOfImage, 0.05, 6);
 scale(scaleValue);
 rotate(radians(frameCount));
 imageMode(CENTER);
 image(myImage[selectedImageNum], 0, 0);
 popMatrix();

 if (mousePressed) {
  loadPixels();
  bgImage.loadPixels();
  bgImage.pixels = pixels;
  bgImage.updatePixels();
 }
}

void keyReleased(){
 if(key == 'd'){
  bgImage = createImage(width,height,RGB);
 }else if(key == '1'){
  selectedImageNum = 0;
 }else if(key == '2'){
  selectedImageNum = 1;
 }
}
```

→ w4_02, → More examples: w4_03

PImage

A datatype for storing images. Processing can display .gif, .jpg, .tga, and .png images. Images may be displayed in 2D and 3D space. *Using .png format allows transparent images to be used.*

Two ways to load a PImage
***loadImage(filename)** loads the image specified by *filename*
***createImage(width, height, format):**
Creates a new PImage (the datatype for storing images). Set the size of the buffer with the *width* and *height* parameters. The *format* parameter defines how the pixels are stored.

Display Image

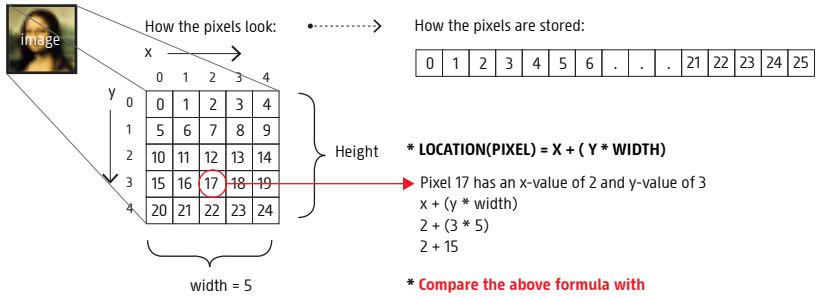
The image() function draws an image to the display window. Images must be in the sketch's "data" directory to load correctly in case of using **loadImage() function**.

***image(PImage to display, x-coordinate of the image, x-coordinate of the image);**

Select "Add file..." from the "Sketch" menu to add the image to the data directory, or just drag the image file onto the sketch window. Processing currently works with GIF, JPEG, TGA and PNG images.

Images & Pixels

A digital image is a collection of colour data – variations of red, green, and blue at a particular location on a grid of pixels. The collection of colour data is saved in an array called the "pixel array". In Processing the loadPixels() function fills the pixel array from the image. updatePixels() updates the pixel array once you're finished manipulating the value of each pixel. In this example the functions loadPixels() and updatePixels() are used to record the movement of an image while the left mouse button is being pressed and moved. The updated image is used as BG for background().



*** LOCATION(PIXEL) = X + (Y * WIDTH)**

Pixel 17 has an x-value of 2 and y-value of 3
x + (y * width)
2 + (3 * 5)
2 + 15

*** Compare the above formula with get() and PImage.get() functions**
more info: http://www.processing.org/reference/get_.html