# Webinar 1A: Introduction to Java Programming Using Processing

* Java syntax
* Program sequence
* Variables
* Expressions

## Learning Objectives

* Familiarity with Processing Environment
  + Writing and saving a program
  + Running a program
  + Correcting syntax errors
* Simple problem decomposition – break problem into smaller chunks
* Program flow (order of commands)
* Using Variables within expressions

## Resources:

open these and have them available for reference

* [Processing.org](https://processing.org/) website (add to favourites)

**Exercise 1 Simple program**

//this is a comment – first program

point(20,20); //draw a dot - where

ellipse(50,50, 10,10); //draw ellipse

see <https://processing.org/reference/ellipse_.html>

1. Move the point to the centre of the ellipse.
2. Draw an egg standing up – touching left hand side
3. Draw an egg on its side – touching the bottom of the screen
4. Draw 2 circles side by side touching the top of the screen

Solutions

ellipse(50,50, 10,10); //draw ellipse

point(50,50); //draw a dot - where

ellipse(10,50, 20,30); //egg lhs of canvas

ellipse(50,90, 30,20); //egg bottom of canvas

ellipse(30,10, 20,20); //left circle at top

ellipse(50,10, 20,20); //right circle at top

**Exercise 2 : drawing lines**

See <https://processing.org/reference/line_.html>

1. Draw a horizontal line of length 20 pixels
2. Draw a diagonal line, top left, to bottom right
3. Add a diagonal line top right to bottom left
4. Using **line** command, draw a square, with an edge of length 20 – how

Design it!

Partial Solutions:

line (10,10, 30,10); //horizontal line - 20 long

line(0,0, 100,100); //top left to bottom right

line(100,0, 0,100); //top right to bottom left

//Square : design

//top edge,

//right edge

//bottom edge

//left edge

**Exercise 3. What does this do?**

//Using a variable - algebra

int x; //declare a box, called x, to store an integer number

x=20;

line(x,20, x,40); //draw line using variable

line(20,x, 40,x); //draw line using variable

Improve the code : variable names should be meaningful – use y, improve the comments

**3.b** write a program to draw a cross at position specified by ( x,y )

**Extra’s**

**Exercise 3**. Draw a bemused lizard face similar to the picture. Design steps?

//draw head

//draw mouth

//draw left eye

//draw right eye



The fill command (see processing reference page) changes the fill colour using 3 parameters

fill (Red,Green,Blue);

here each parameter has a range of [0..255], so fill( **255**, **0**, **0**) would be **red**.

Because, maximum amount of Red and 0 Green and 0 Blue.

When using multiple fill colours, the fill command is like dipping your paintbrush in a pot of colour. You have only one brush, so when you draw something new it will be filled in the current fill colour.

Save your program.

**Exercise 4** . We are going to amend our green face to allow it to be positioned at an **x** and **y** location. Introduce 2 global variables, **x** and **y** to the top of your code and set them to (100,100). Amend the appropriate commands replacing fixed values with variables.

**Exercise 5**– Alter our code so that the face can be scaled as well as positioned, depending on **x**,**y** & **size** variables. You should introduce new variables to ease the coding.

**Exercise 6 – Debug** , fix the following code

float x;

float size = 50;

30=x;

ellipse(x,y,size/2,size/2);

fill(0,0;

line(x,y,x+size,y);

line(x,y,x+size/2,y-size/2);

line(x+size,y,x+size/2,y-size/2)

ellipse(x,y,size/2,size/2);

**Strategy :**

1. Fix syntax errors – what do we have. Correct from top of file downwards
2. Run it – does it produce something sensible? Try to add comments to blocks of code
3. Correct the logic – in this case, reposition an ellipse, move fill command

Some Solutions :

Ex1 face

//this is a comment - draw a face

ellipse(35,35, 70,70); //50 for froggy face

ellipse(20,20, 10,10); //left eye

point(20,20); //left eye centre

ellipse(50,20, 10,10); //right eye

point(50,20);

//nose in middle

line(20+15,20, 20+15, 40); //20 long

line(20,50, 50,50); //mouth

ex2.

//lizard face

fill(0,255,0); //green

ellipse(50,50, 60,60); //Head

line(50-20,50, 50+20,50); //mouth

fill(255,255,255); //white

ellipse(50-20,50-20, 10,10); //left eye

point(50-20,50-20); //left eye centre

ellipse(50+20,50-20, 10,10); //right eye

point(50+20,50-20); //right eye centre

Ex4. Scalable, repositionable Lizard

//lizard face

float x=50, y=50;

float size = 50;

float offset = size/3; //distance from centre of face to eye centre

float eyeSize = size/5;

size(500,500);

fill(0,255,0); //green

ellipse(x,y, size,size); //Head

line(x-offset,y, x+offset,y); //mouth

fill(255,255,255); //white

ellipse(x-offset,y-offset, eyeSize,eyeSize); //left eye

point(x-offset,y-offset); //left eye centre

ellipse(x+offset,y-offset, eyeSize,eyeSize); //right eye

point(x+offset,y-offset); //right eye centre

Ex3.

float xHead=250, yHead=250;

float torso = 150; //length of body

float offset = torso/2;

size(500,500);

//draw Head

ellipse(xHead,yHead, torso/3,torso/3);

//draw torso

line(xHead,yHead, xHead,yHead+torso);

//draw arms

line(xHead-offset,yHead+offset, xHead+offset,yHead+offset);

//draw legs

float yBottom = yHead+torso;

line(xHead,yBottom, xHead-offset,yBottom+offset); //left leg

line(xHead,yBottom, xHead+offset,yBottom+offset); //right leg