Ontario Tech University

SOFE 4850U
Fall 2022

Lab 1: Introduction of Processing IDE

[Download IDE]

Introduction

- Coding experience?
- Visual programming language
- Processing - A project started by MIT Media Lab developers in 2001
- Entertaining programming language
- Easy to learn and understand
- Like painting on canvas
- Only limit is our imagination

Processing IDE - Platform

- It is built on top of Java programming language
- Written programs gets converted to Java programs.
- Java's Applet class is the base class for all Processing sketches
- New classes will be treated as inner classes
- Processing is based on Java but anyone without prior coding exp. Can do it.

```
public class ExampleFrame extends Frame {

    public ExampleFrame() {
        super("Embedded PApplet");

        setLayout(new BorderLayout());
        PApplet embed = new Embedded();
        add(embed, BorderLayout.CENTER);

        embed.init();
    }
}

public class Embedded extends PApplet {

    public void setup() {
      // setup codes goes here
    }
    public void draw() {
      // draw codes goes here
    }

}
```


https://www.toptal.com/game/ultimate-guide-to-processing-the-fundamentals

Sketching with Processing - Static

```
size(480, 270);
background(255);
stroke(0);
fill(150);
rect(50, 50, 75, 100);
```

- 255 = white, 0 = Black
- Drawing Order – Top to bottom

Animation

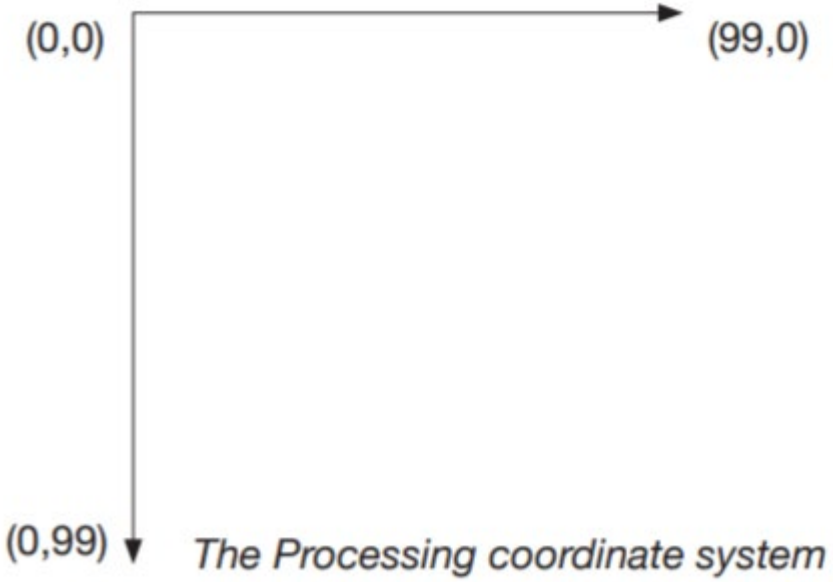
```
void setup() {
    size(400, 400);
    stroke(255);
    background(192, 64, 0);
}

void draw() {
    line(150, 25, mouseX, mouseY);
}
```

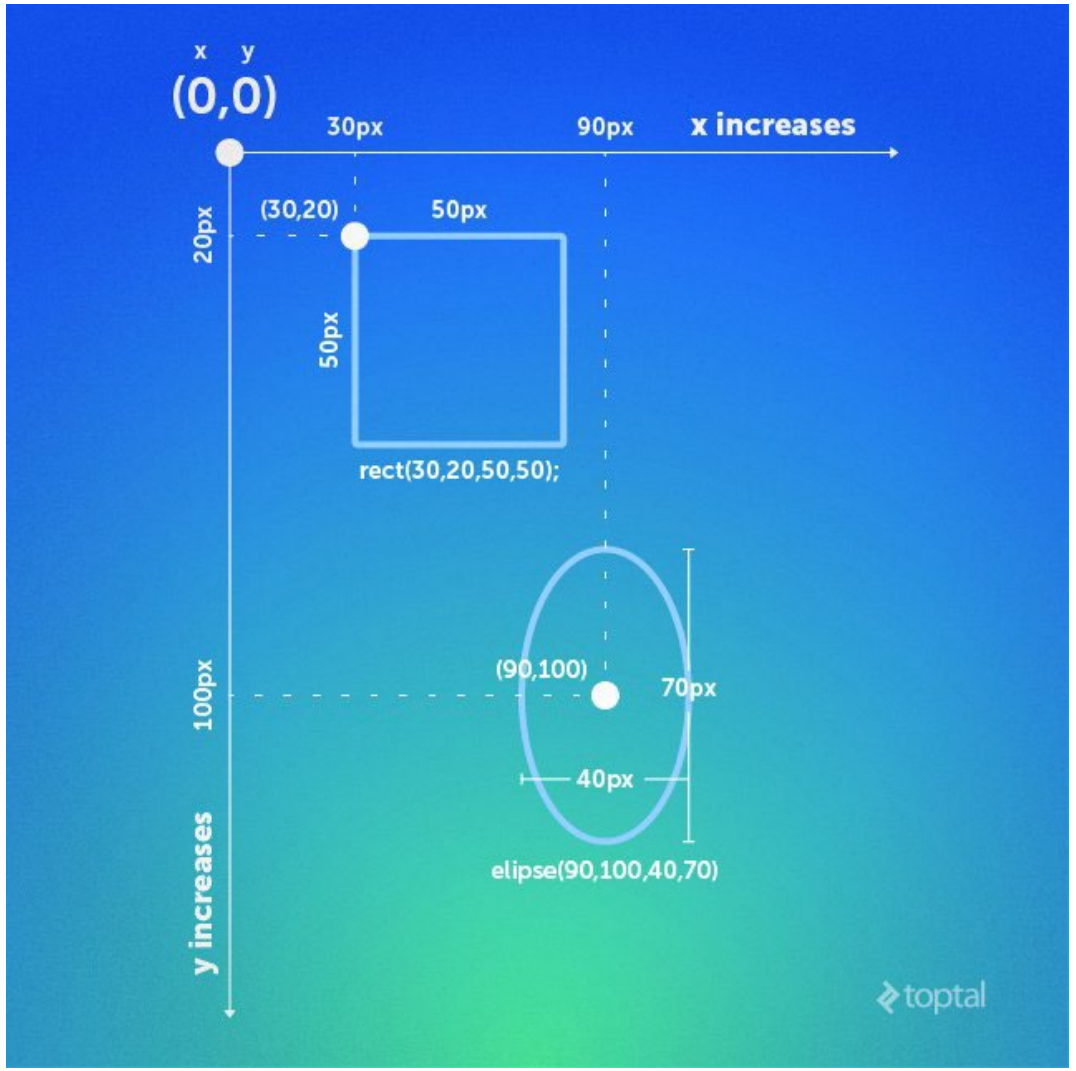
- Setup() – runs one time, initialization
- Draw() – runs repeatedly

- The size() function must always be the first line inside setup()

- Task1: move background() in draw()

Coordinate system





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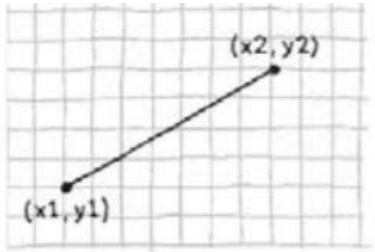
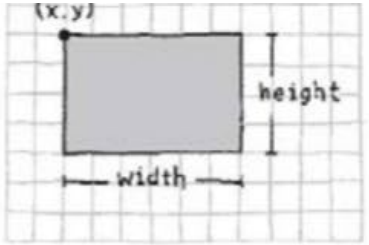
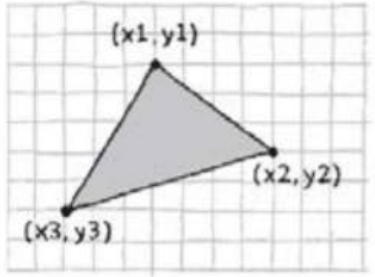
Basic Shapes



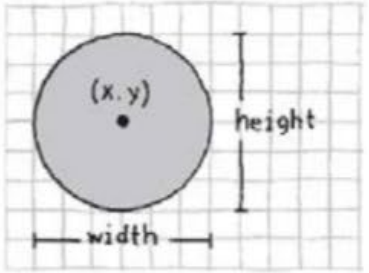
line(x1, y1, x2, y2)



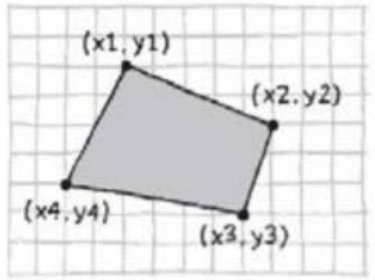
rect(x, y, width, height)



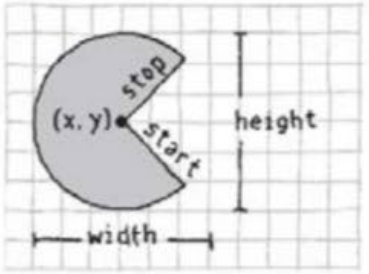
triangle(x1, y1, x2, y2, x3, y3)



ellipse(x, y, width, height)



quad(x1, y1, x2, y2, x3, y3, x4, y4)



arc(x, y, width, height, start, stop)

Different shapes in Processing and their parameters

Data Types

Data Type	Syntax
Char	Char var = ‘v’
Int	Int var = 20
float	float var = 4.56
Boolean	Boolean boolVar = true
String	String strVar = “string variable”

Array:

- One dimensional: float[] distance;
- 2d-Array: float[][] distances;

```
int[] numberArray = new int[5];
int[] numberArray = {1, 2, 3, 4, 5};
numberArray[2] = 3;
```

Conditions

```
if (var > 20) {
  // your code goes here
} else {
  // else code block
}
```

Loops

```
y = 50;
for(int i = 0; i < num; i++) {
  rect(425, y, 30, 10);
  y += 20;
}

while(y>0){
    println(y);
    y--;
}
```

Colors

- stroke() - border and fill() – inside shape
- background() for background color

1. 0 to 255
2. (R,G,B) value
3. (R,G,B, transparency(alpha value - optional))
4. Alpha value ranges – 0(transparent) to 255(entirely opaque)

Mouse and Keyboard

keycode: UP, DOWN, LEFT, RIGHT, ALT, CONTROL, SHIFT, BACKSPACE, TAB, ENTER, RETURN, ESC and DELETE
Mouse: Left, Right, Center

Work with images and files

- Image/File : Drag and drop in the editor
- Data folder

```
// Examples of loading a text file and a JPEG image
// from the data folder of a sketch.
String[] lines = loadStrings("something.txt");
PImage image = loadImage("picture.jpg");
```

- **Save images:** saveFrame() and saveImage()

Objects & Inheritance

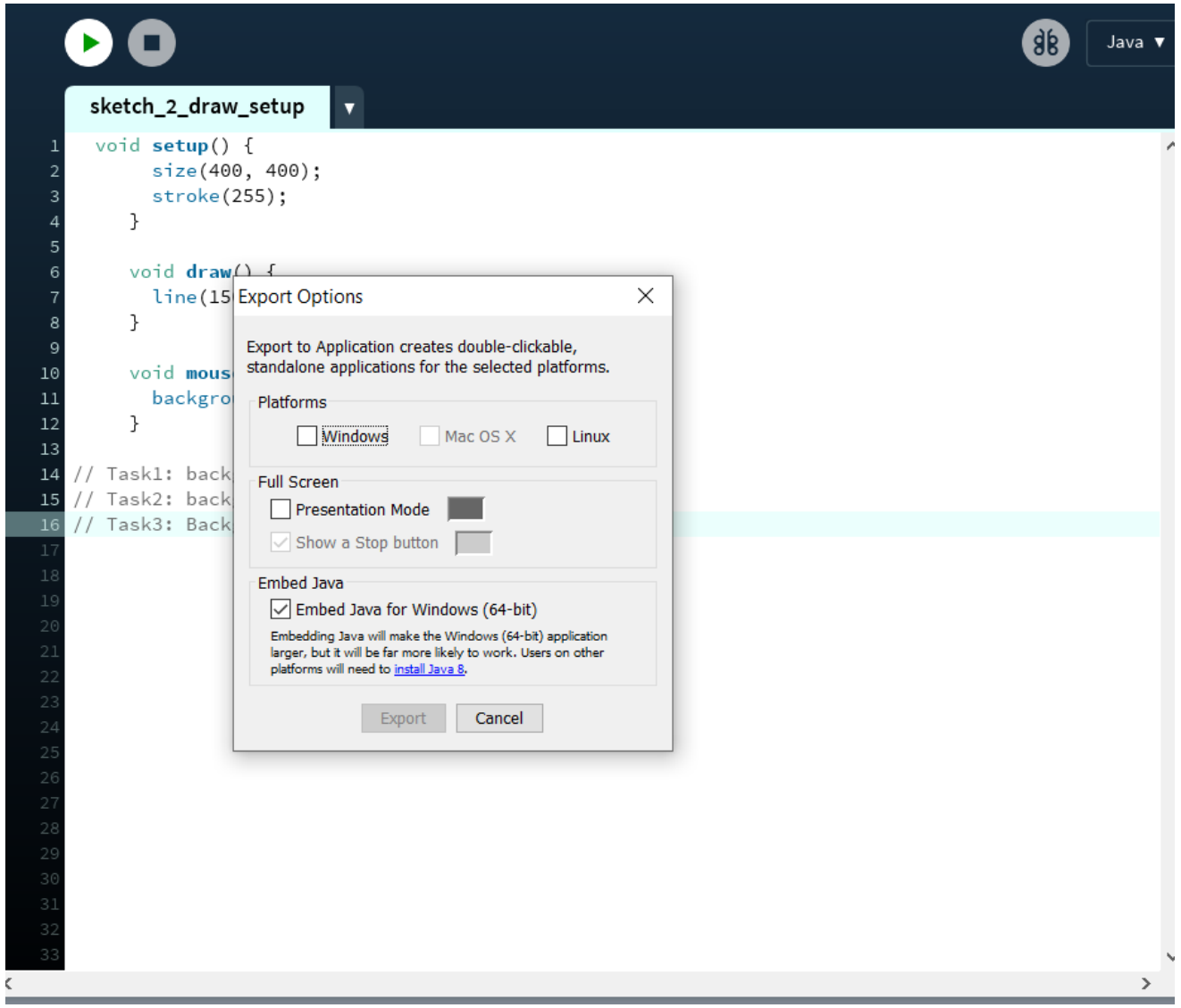
- See Examples – built-in sketches examples

Extra

- Load data – XML, JSON, web images, csv
- Regex

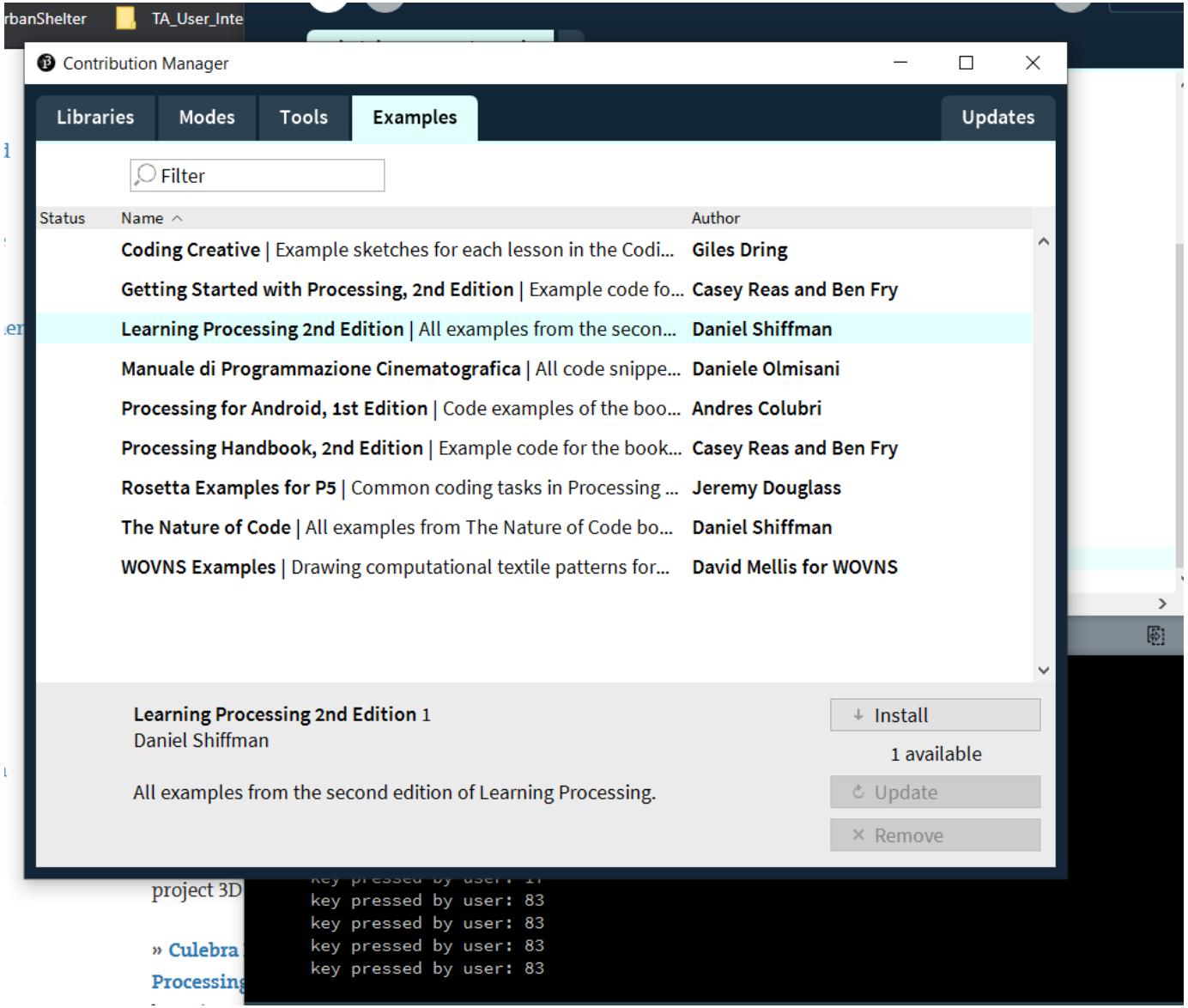
Export/Distribute

File → Export Application



Libraries

Sketch -> Import Library -> Add Library



Interested in Hardware & Processing?

- Check this Tutorial: Link

Interested in Processing IDE?

https://processing.org/reference/

http://processing.org/reference/libraries/

Examples and Projects Online

https://www.openprocessing.org/browse/

https://openprocessing.org/sketch/1200087

Questions?