

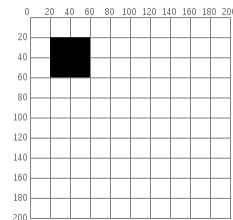
Transformations

Creative Coding & Generative Art in Processing 2
Ira Greenberg, Dianna Xu, Deepak Kumar

Slides edited by Michael Goldwasser

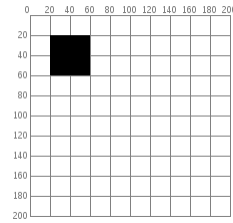
2D Transformations: Translate

```
rect(20, 20, 40, 40);
```

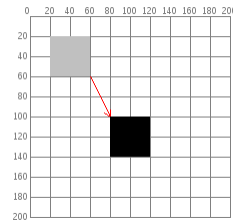


2D Transformations: Translate

```
rect(20, 20, 40, 40);
```



```
rect(20+60, 20+80, 40, 40);
```

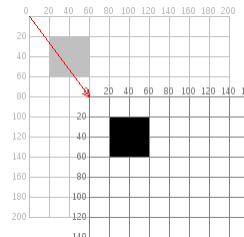


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2D Transformations: Translate

```
translate(60, 80);  
rect(20, 20, 40, 40);
```



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Preserving Context

- **translate()** will change the coordinate system for the entire duration of the draw() cycle. It resets at each cycle.
- Use **pushMatrix()** and **popMatrix()** to preserve context during a draw() cycle. i.e.

```
pushMatrix();
translate(<x>, <y>);
<Do something in the new coordinate context>
popMatrix();
```

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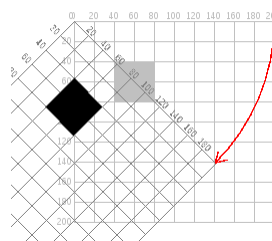
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2D Transformations: Rotate

```
void setup() {
  size(200, 200);
  background(255);
  smooth();
  fill(192);
  noStroke();

  rect(40, 40, 40, 40);

  pushMatrix();
  rotate(0.25*PI);
  fill(0);
  rect(40, 40, 40, 40);
  popMatrix();
} // setup()
```



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2D Transformations: Rotate

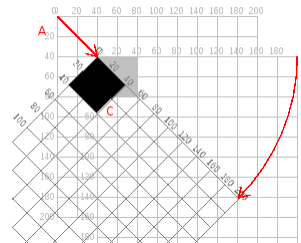
```

void setup() {
  size(200, 200);
  background(255);
  smooth();
  fill(192);
  noStroke();

  rect(40, 40, 40, 40);

  pushMatrix(); // move the origin to the pivot point
  translate(40, 40); // then pivot the grid
  rotate(0.25*PI); // and draw the square at the origin
  fill(0);
  rect(0, 0, 40, 40);
  popMatrix();
} // setup()

```



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2D Transformations: Scaling

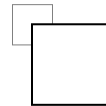
```

void setup() {
  size(200,200);
  background(255);

  stroke(128);
  rect(20, 20, 40, 40);

  stroke(0);
  pushMatrix();
  scale(2.0);
  rect(20, 20, 40, 40);
  popMatrix();
} //setup()

```



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