

Linear Algebra Assignment 3

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Note : Markov chains and Hill Cipher was submitted in the same document for assignment 1 instead of splitting them and submitting separately. This document was submitted in the form for assignment 2 but is actually assignment 3.

Python code (executed on processing IDE) :

1. Translation :

```
def setup():
    size(200, 200)
    background(255)
    noStroke()

    # draw the original position in gray
    fill(192)
    rect(20, 20, 40, 40)

    # draw a translucent red rectangle by changing the coordinates
    fill(255, 0, 0, 128)
    rect(20 + 60, 20 + 80, 40, 40)

    # draw a translucent blue rectangle by translating the grid
    fill(0, 0, 255, 128)
    pushMatrix()
    translate(60, 80)
    rect(20, 20, 40, 40)
    popMatrix()
```

2. Rotation :

```
def 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(radians(45))  
  
    # and draw the square at the origin  
    fill(0)  
    rect(0, 0, 40, 40)  
    popMatrix()
```

3. Scaling :

```
def setup():  
    size(200, 200)
```

background(255)

stroke(128)

rect(20, 20, 40, 40)

stroke(0)

pushMatrix()

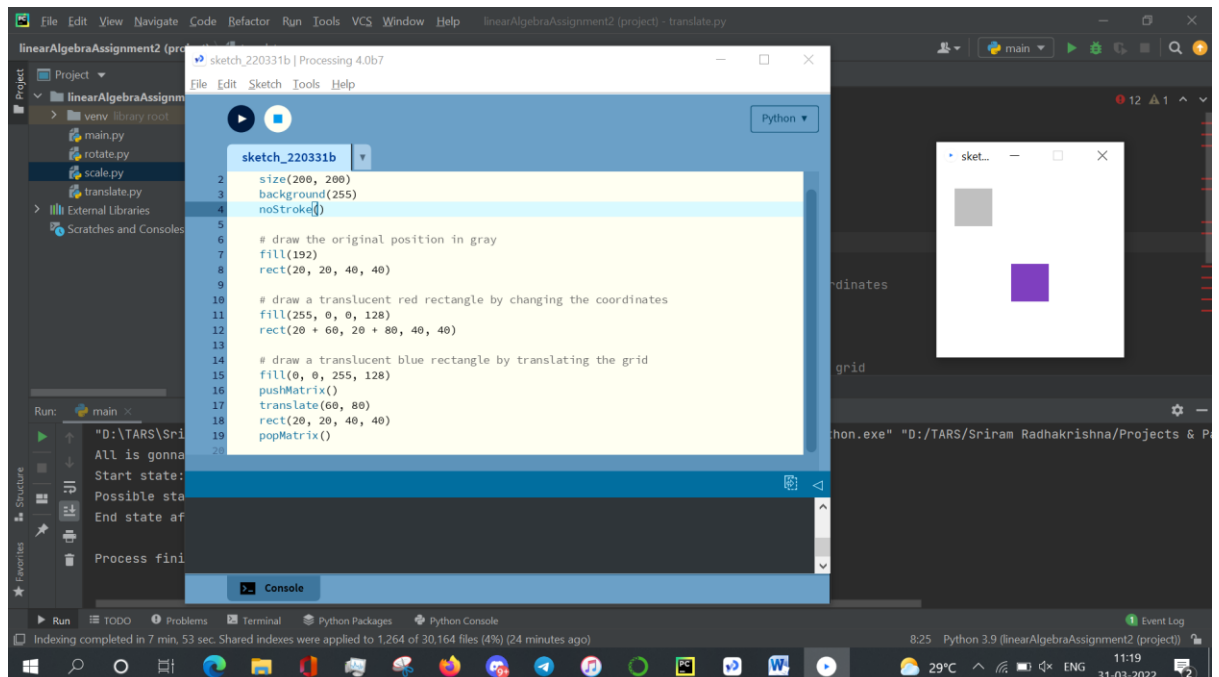
scale(2.0)

rect(20, 20, 40, 40)

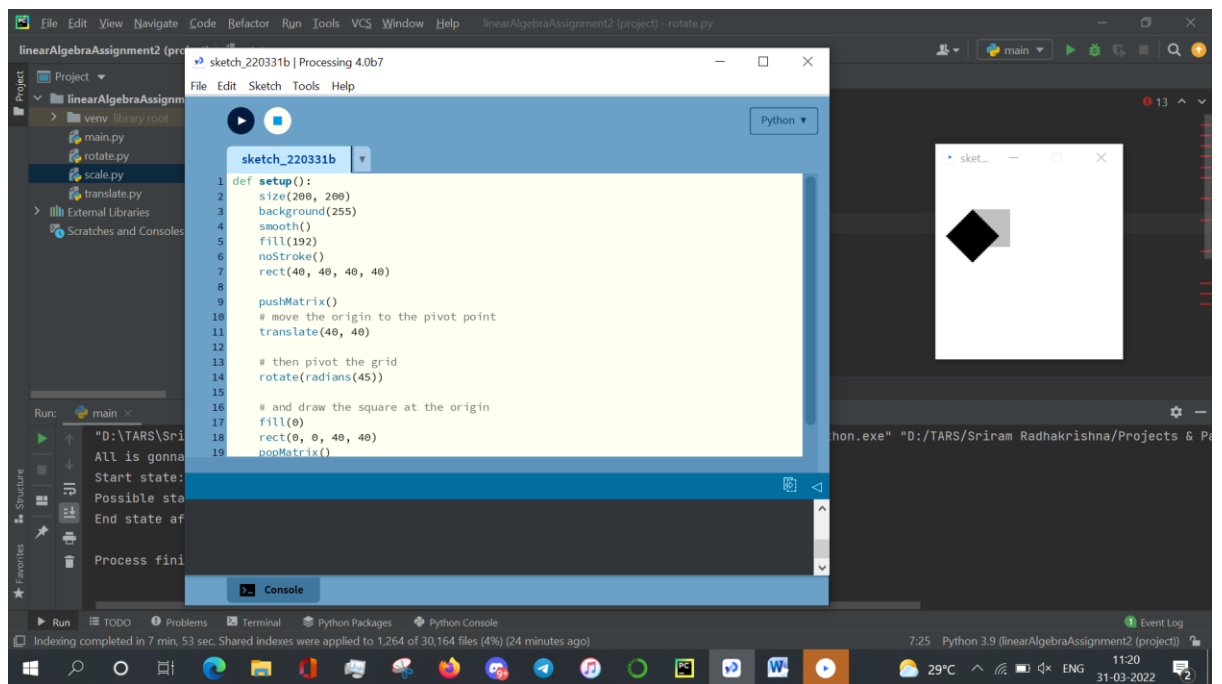
popMatrix()

Output screenshots :

1. Translation :



2. Rotation :



3. Scaling :

