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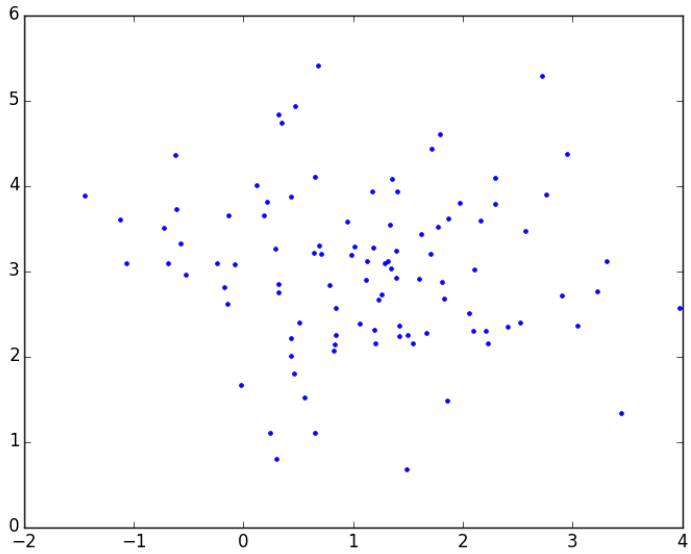
A. See code

B. See code

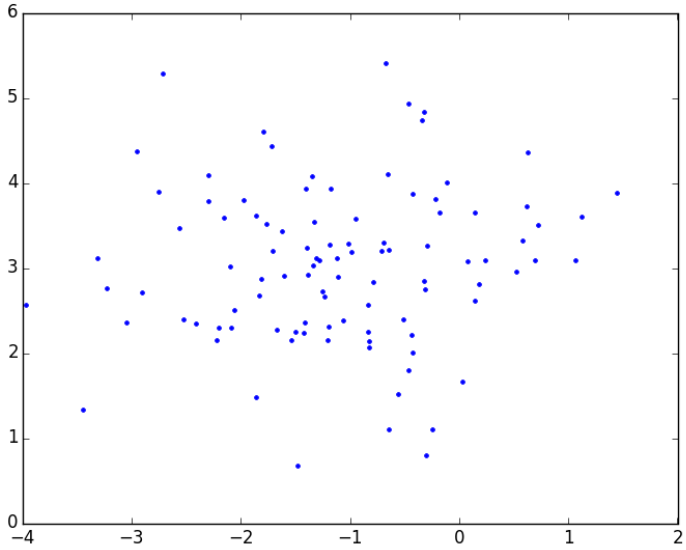
C. 100 Bivariate Gaussian Random data points, plotted



D. Transformation matrix for mirror by Y axis:

$$\boldsymbol{A_1} = \begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$$

E. Transformation result plotted – mirror by Y axis:



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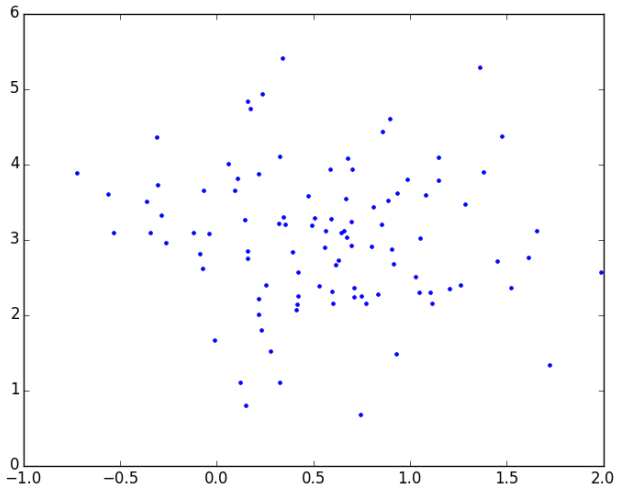
F. Transformation matrix for scaling X axis by 0.5:

$$\boldsymbol{A_2} = \begin{bmatrix} 0.5 & 0 \\ 0 & 1 \end{bmatrix}$$

G. Transformation result plotted – scaling X axis by 0.5:



H. Transformation matrix for rotating data 45 degree clock-wise:

$$\boldsymbol{A_3} = \begin{bmatrix} \cos\frac{\pi}{4} & \sin\frac{\pi}{4} \\ -\sin\frac{\pi}{4} & \cos\frac{\pi}{4} \end{bmatrix}$$

(Continued)

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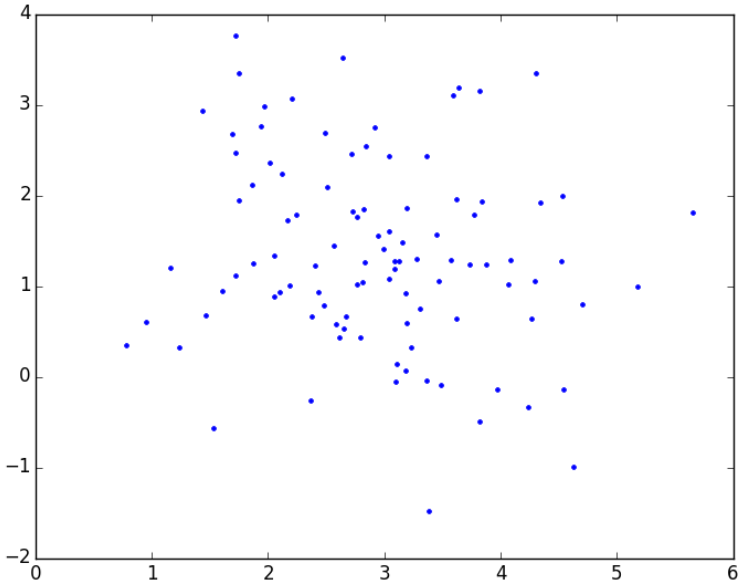
I. Transformation result plotted – rotating data 45 degree clock-wise:



J. Transformation matrix for mirror by X axis:

$$\boldsymbol{A_4} = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$$

K. Composite mapping matrix

$$\boldsymbol{A_5} = \boldsymbol{A_2 A_1 A_4} = \begin{bmatrix} 0.5 & 0 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix} = \begin{bmatrix} \boldsymbol{-0.5} & \boldsymbol{0} \\ \boldsymbol{0} & \boldsymbol{-1} \end{bmatrix}$$

(continued)

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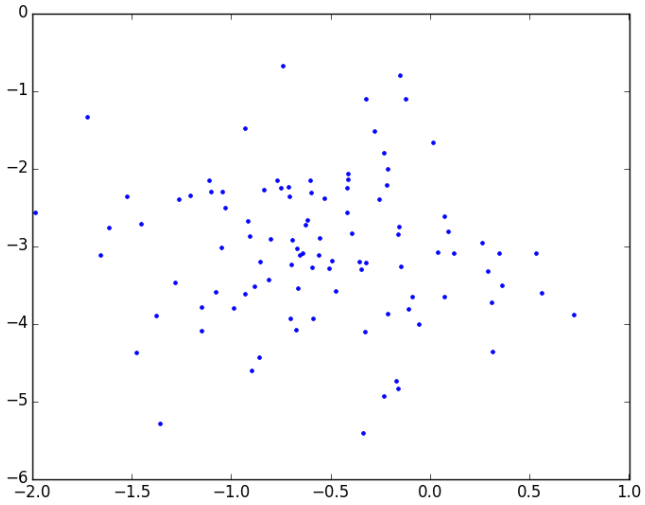
L. Transformation result plotted – composite mapping



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