2021.09.13 양진현

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| 1번 코드 |
| import numpy as np import matplotlib import matplotlib.pyplot as plt  A=np.array([[5,2],[-5,3]]) B=np.array([9,1])  x1,y1=np.linalg.solve(A,B)  print(x1,y1) fig=plt.figure() ax=fig.add\_subplot(1,1,1) for a1,a2,b in zip(A[:,0],A[:,1],B):  x=np.linspace(-7,7,100)  y=(b-a1\*x)/a2  ax.plot(x,y,color="black")   ax.plot(x1,y1,'bo') ax.axis([-7,7,-7,7]) ax.set\_xticks(range(-7,7)) ax.set\_yticks(range(-7,7)) ax.grid() ax.set\_aspect('equal',adjustable='box')  ax.spines['left'].set\_position('zero') ax.spines['bottom'].set\_position('zero')  ax.spines['right'].set\_color('none') ax.spines['top'].set\_color('none')  plt.show() |

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| 1번 결과 |
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| 2번 코드 |
| import numpy as np import matplotlib import matplotlib.pyplot as plt import cv2  img=cv2.imread("welcome.jpg",cv2.IMREAD\_COLOR) h,w=img.shape[:2] M=np.array([[1,0,150],[0,1,50]],dtype=float)   img1=cv2.warpAffine(img,M,(w,h)) result=cv2.hconcat([img,img1]) cv2.imshow("exam",result)  cv2.waitKey(0) |

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| 2번 결과 |
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| 3번 코드 |
| import numpy as np import matplotlib import matplotlib.pyplot as plt import cv2  img=cv2.imread("welcome.jpg",cv2.IMREAD\_COLOR) h,w=img.shape[:2] img\_zero1=np.zeros\_like(img) img\_zero2=np.zeros\_like(img)   img1=cv2.resize(img,None,fx=0.7,fy=0.7) h1,w1=img1.shape[:2] img\_zero1[:h1,:w1,:]=img1 img2=cv2.resize(img,None,fx=0.3,fy=0.3) h2,w2=img2.shape[:2] img\_zero2[:h2,:w2,:]=img2  result=cv2.hconcat([img,img\_zero1,img\_zero2]) cv2.imshow("exam",result)  cv2.waitKey(0) cv2.destroyAllWindows() |

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| 3번 결과 |
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| 4번 코드 |
| import numpy as np import matplotlib import matplotlib.pyplot as plt import cv2  img=cv2.imread("welcome.jpg",cv2.IMREAD\_COLOR) h,w=img.shape[:2] angle=0 center=(w/2,h/2)  matrix = [] img\_dst = []; img\_tmp = [] for i in range(6):  if (i == 0):  img\_dst.append(img)   else:  angle = angle + 60  matrix.append(cv2.getRotationMatrix2D((center), angle, 1))  img\_dst.append(cv2.warpAffine(img, matrix[i - 1], (w, h)))   if i == 2 or i == 5:  img\_tmp.append(cv2.hconcat([img\_dst[i - 2],img\_dst[i - 1], img\_dst[i]]))   result=cv2.vconcat([img\_tmp[0],img\_tmp[1]])  cv2.imshow("exam",result) cv2.waitKey(0) cv2.destroyAllWindows() |

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| 4번 결과 |
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| 5번 코드 |
| import cv2 import matplotlib import matplotlib.pyplot as plt import numpy as np  img=cv2.imread("welcome.jpg",cv2.IMREAD\_COLOR) scale=0.7 i10=np.zeros\_like(img) h,w=img.shape[:2] img1=cv2.resize(img,None,fx=scale,fy=scale,interpolation=cv2.INTER\_AREA) h1,w1=img1.shape[:2] center=[w/2,h/2] *#중심값은 원본에서 변하지않음* n\_w=0.15\*w n\_h=0.15\*h i10[:h1,:w1,:]=img1 M=np.array([[1,0,n\_w],[0,1,n\_h]],dtype=float)  img2=cv2.warpAffine(img1,M,(w,h)) i3=cv2.getRotationMatrix2D(center,45,1) img3=cv2.warpAffine(img2,i3,(w,h))  a=cv2.hconcat([img,i10]) b=cv2.hconcat([img2,img3]) res=cv2.vconcat([a,b])  cv2.imshow("exam",res)  cv2.waitKey(0) cv2.destroyAllWindow() |

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| 5번 결과 |
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