

L10_notebook

September 21, 2022

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[ ]: import numpy as np
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```
[ ]: def house(A_param):  
    A = A_param.copy()  
    m, n = A.shape  
    for k in range(n):  
        x = A[k:, k]  
        v = np.sign(x[0])*np.linalg.norm(x)*np.eye(1, len(x), 0)+x  
        v = v/np.linalg.norm(v)  
        A[k:,k:] = A[k:,k:] - 2*np.dot(v.T, np.dot(v, A[k:,k:]))  
    return A
```

```
[ ]: # Random 5x5 matrix  
A = np.random.rand(5,5)
```

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[ ]: np.set_printoptions(formatter={'float': lambda x: "{0:0.3f}".format(x)})
```

```
[ ]: print(A)
```

```
[[0.763 0.909 0.163 0.771 0.737]  
 [0.270 0.532 0.900 0.305 0.465]  
 [0.021 0.615 0.117 0.564 0.321]  
 [0.964 0.023 0.556 0.863 0.892]  
 [0.513 0.920 0.752 0.782 0.204]]
```

```
[ ]: print(house(A))
```

```
[[ -1.359 -0.990 -0.951 -1.409 -1.221]  
 [ 0.000 -1.164 -0.399 -0.477 -0.099]  
 [ 0.000 0.000 0.814 0.006 0.033]  
 [ 0.000 -0.000 0.000 -0.385 -0.137]  
 [ 0.000 0.000 0.000 0.000 0.424]]
```

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[ ]:
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