

hw01

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```
[3]: a, b, c, d, e, f = 4, 3.1415, 1.0, 2 + 4j, 'Hello', 'World'  
a, b, c, d, e, f
```

```
[3]: 4
```

```
[17]: import numpy as np  
u = np.array([1, 1, 2, 3, 5, 8])  
v = u.T  
x = np.array([[1, 0],  
              [0, 1]])  
y = np.array([[1, 2],  
              [3, 4]])  
z = np.array([[1, 2, 1, 2],  
              [3, 4, 3, 4],  
              [1, 2, 1, 2]])  
w = np.block([[x, x],  
              [y, y]])
```

```
[17]: array([[1, 0, 1, 0],  
            [0, 1, 0, 1],  
            [1, 2, 1, 2],  
            [3, 4, 3, 4]])
```

```
[18]: u.T
```

```
[18]: array([1, 1, 2, 3, 5, 8])
```

```
[19]: np.linalg.inv(x)
```

```
[19]: array([[1., 0.],  
            [0., 1.]])
```

```
[38]: select_x = w[:2, :2]  
select_x
```

```
[38]: array([[1, 0],  
            [0, 1]])
```

```
[40]: select_y = w[2:, 2:]
      select_y
```

```
[40]: array([[1, 2],
           [3, 4]])
```

```
[44]: np.hstack((select_x.T, select_y.T)).T
```

```
[44]: array([[1, 0],
           [0, 1],
           [1, 2],
           [3, 4]])
```

```
[47]: np.matmul(np.matmul(np.linalg.inv(np.matmul(x.T, x)), x.T), y)
```

```
[47]: array([[1., 2.],
           [3., 4.]])
```

```
[65]: stock_number = 600925
      close_price = np.array([[5.43, 5.46, 5.39, 5.37, 5.4, 5.33, 5.31, 5.34, 5.27, 5.
      ↪33, 5.27, 5.38, 5.32, 5.47, 5.34, 5.62],
                             [1029, 1028, 1025, 1024, 1023, 1022, 1021, 1018, 1017,
      ↪1016, 1015, 1014, 1011, 1010, 1009, 1008]])
      close_price = np.flip(close_price)
```

```
[67]: close_price[1].mean(), close_price[1].var()
```

```
[67]: (5.376875, 0.007246484375000011)
```

```
[68]: close_price
```

```
[68]: array([[1008. , 1009. , 1010. , 1011. , 1014. , 1015. , 1016. ,
           1017. , 1018. , 1021. , 1022. , 1023. , 1024. , 1025. ,
           1028. , 1029. ],
           [ 5.62,  5.34,  5.47,  5.32,  5.38,  5.27,  5.33,
            5.27,  5.34,  5.31,  5.33,  5.4 ,  5.37,  5.39,
            5.46,  5.43]])
```

```
[70]: import matplotlib.pyplot as plt

      # Separate time and close prices
      time = close_price[0]
      price = close_price[1]

      # Create a figure with two subplots
      fig, axs = plt.subplots(2, 1, figsize=(10, 10))
```

```
# 1. Histogram of Close Prices
axs[0].hist(price, bins=10, color='skyblue', edgecolor='black')
axs[0].set_title('Histogram of Close Prices')
axs[0].set_xlabel('Close Price')
axs[0].set_ylabel('Frequency')

# 2. Growth Curve (Line Plot)
axs[1].plot(time, price, marker='o', color='orange', label='Close Price')
axs[1].set_title('Growth Curve of Close Prices Over Time')
axs[1].set_xlabel('Time')
axs[1].set_ylabel('Close Price')
axs[1].legend()

# Show the plots
plt.tight_layout()
plt.show()
```

