matplotlib绘制直方图和箱线图

In [1]:

```
import matplotlib.pyplot as plt
import numpy as np
```

直方图--hist

In [2]:

```
np.random.seed(100)
data = np.random.normal(9000, 3000, size=300)
data = data[data>=4000]
data
```

Out[2]:

```
array([10028.04120998, 12459.10740769,  8242.69189044, 11943.96236
085,
       10542.65652418,  9663.53900766,  5789.8700083 ,  8431.51250
753,
        9765.00433282,  7625.91904349, 10305.49046437,  7249.21484
903,
       11450.54121506, 11018.16241713,  8686.76656983,  7406.15886
944,
       12089.1980554 ,  7685.59313189,  5645.04526123, 13856.94498
203,
       13624.81552354,  8244.36258236,  6472.69278525,  9553.55607
169,
       11811.24660333, 11193.0010315 , 13084.66837544,  8021.28582
239,
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322,
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409,
        4930.80285342,  5302.69645826,  7366.68251498,  6995.48478
956,
        9021.94368969,  7161.18379357, 12899.24422427,  6050.06970
261,
       10072.5232595 ,  4159.26449153, 13412.14159984,  5435.94720
805,
        7350.76141939,  6179.86151537,  6516.2029069 ,  9326.59040
35 ,
       10523.42877148,  6413.31796047, 12748.40922818,  8761.16626
225,
        6330.8055562 ,  6354.60483155,  9055.91684846,  9713.53386
577,
        9040.64564589,  4093.41180186,  5867.37036687, 10839.11664
506,
       11208.61563997, 12080.7643182 ,  4703.42816682, 10098.27967
85 ,
        8004.66859484,  6932.34606573, 15103.82268451,  7347.85676
426,
       11251.35999098,  5079.02298276, 10741.72000738,  5686.43072
```

```
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44 ,
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089,
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283,
        9011.87278196,  8444.95766731,  5591.21697952,  9099.95183
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412,
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07 ,
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746,
       13758.51281527, 11080.17197555,  8595.59606403,  4378.15192
634,
       15140.14190545,  4809.00196514,  5708.48404608,  8283.86139
206,
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728,
       11279.07935955,  4506.83885675,  5418.34206962, 12888.78775
92 ,
       11856.82687825,  5348.23760808,  8528.20449787,  4477.24451
921,
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744,
        7077.72023097, 11338.87891099,  7685.63725095, 15224.37950
384,
        7970.10695345,  7150.11188495, 11289.55093818,  9578.75157
547,
        7954.62320804, 15895.96182214,  8504.37134208, 10398.89810
507,
        9809.96171589,  8040.50685865,  5556.77520037, 14110.87196
436,
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012,
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03 ,
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92 ,
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886,
       14970.82094926, 10568.99341356,  8950.96379173,  7752.55099
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127,
        5717.8712069 , 12710.72365557,  8309.14596472,  6886.74540
079,
        7225.87463674, 11210.98550705, 10307.60175754, 14327.98075
652,
       10539.22313652, 12511.58094884, 15233.13669675,  7632.23394
236,
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545,
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808,
        7688.80675305,  9305.32731891, 12925.04047993, 13162.80543
423,
        9865.13226068,  7982.74370017, 10582.10739847,  7877.09134
876,
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176,
       10270.37184551,  8521.44790499, 12723.24626159, 13990.60893
221,
        7014.18685522, 19395.68144544, 10174.31585782,  9981.73605
893,
        8065.95881829,  4726.03323396,  7125.38344398,  8670.01381
224,
       11858.87828398,  6049.91206907,  5716.32843115,  8275.95375
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053,
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554,
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363,
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627,
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628,
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459,
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5  ,
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349,
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963,
       10441.23423381, 10404.00206461, 17127.0058421 , 15057.25835
019,
       11242.21025472,  7230.87423976,  6559.72552627,  8469.30940
697,
       10521.14250593,  8199.66550729,  6431.81393401, 13677.94457
067,
        5721.93340612, 11274.1274945 ,  5401.6800916 ,  9529.11143
447,
        6372.8074752 ,  9352.8253688 ,  6125.49499326,  9547.02818
246])
```
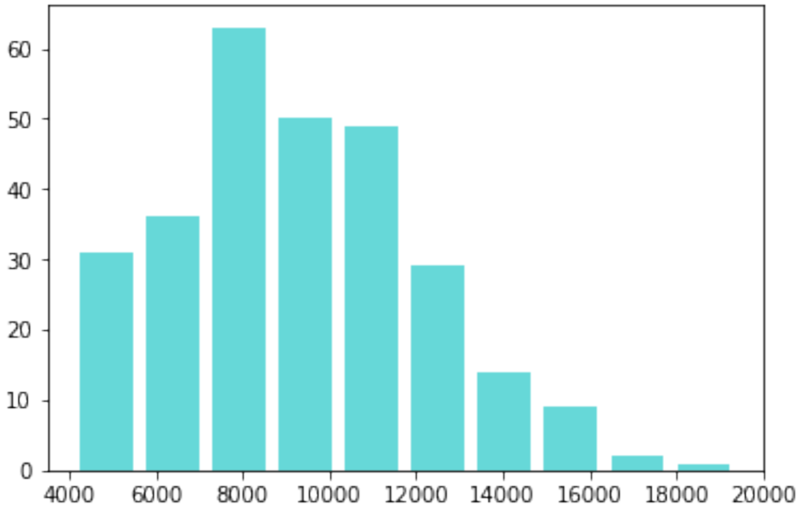
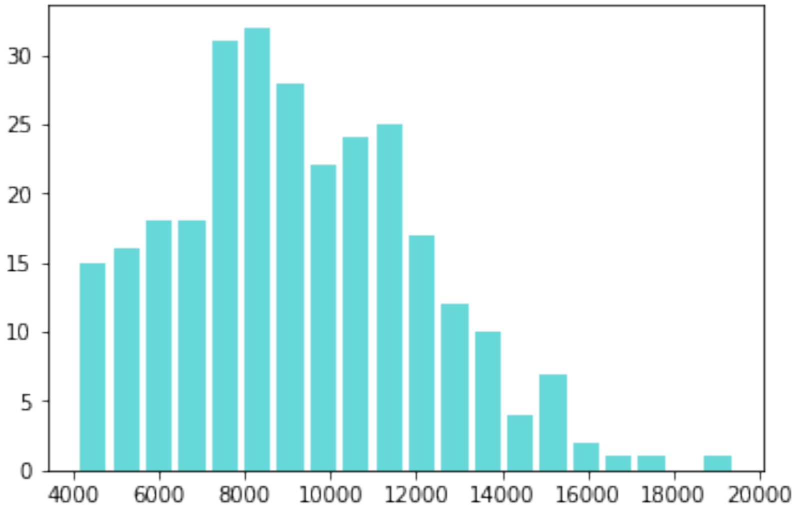

In [3]:
```
plt.hist(data, color='c', rwidth=0.8, alpha=0.6)
plt.show()
```



In [4]:
```
# 实际开发中，bins用得很多，表示分成了20个区间来统计画图
plt.hist(data, color='c', rwidth=0.8, alpha=0.6, bins=20)
plt.show()
```



In [5]:
```
len(data[data<4900])
```

Out[5]:
```
15
```

In [6]:
```
len(data[(data>7000) & (data<9500)])
```

Out[6]:
```
96
```

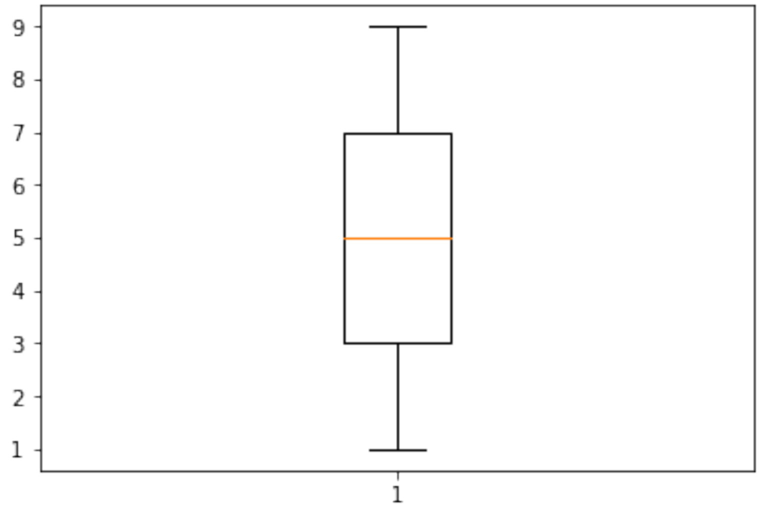
箱线图--boxplot

In [7]:
```
data = np.arange(1, 10)
data
```

Out[7]:
```
array([1, 2, 3, 4, 5, 6, 7, 8, 9])
```

In [8]:

```
plt.boxplot(data)
plt.show()
```



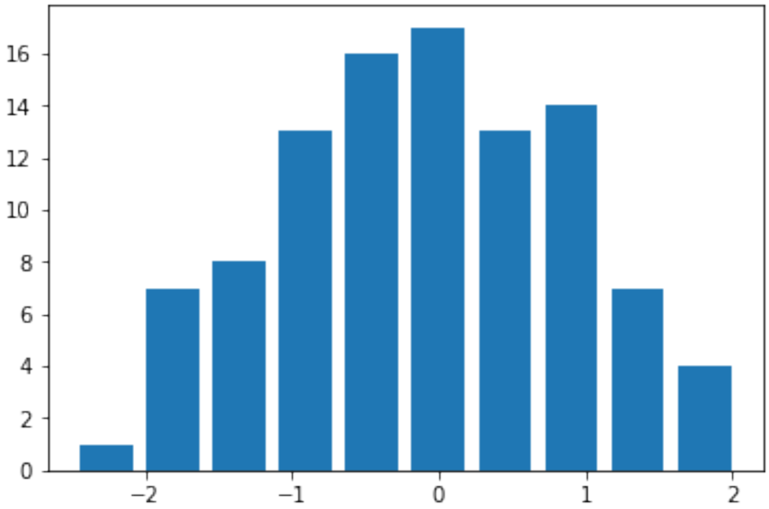
In [9]:

```
np.random.seed(100)
data = np.random.normal(size=100)
data
```

```
Out[9]: array([-1.74976547,  0.3426804 ,  1.1530358 , -0.25243604,  0.9813
        2079,
                0.51421884,  0.22117967, -1.07004333, -0.18949583,  0.2550
        0144,
               -0.45802699,  0.43516349, -0.58359505,  0.81684707,  0.6727
        2081,
               -0.10441114, -0.53128038,  1.02973269, -0.43813562, -1.1183
        1825,
                1.61898166,  1.54160517, -0.25187914, -0.84243574,  0.1845
        1869,
                0.9370822 ,  0.73100034,  1.36155613, -0.32623806,  0.0556
        7601,
                0.22239961, -1.443217  , -0.75635231,  0.81645401,  0.7504
        4476,
               -0.45594693,  1.18962227, -1.69061683, -1.35639905, -1.2324
        3451,
               -0.54443916, -0.66817174,  0.00731456, -0.61293874,  1.2997
        4807,
               -1.73309562, -0.9833101 ,  0.35750775, -1.6135785 ,  1.4707
        1387,
               -1.1880176 , -0.54974619, -0.94004616, -0.82793236,  0.1088
        6347,
                0.50780959, -0.86222735,  1.24946974, -0.07961125, -0.8897
        3148,
               -0.88179839,  0.01863895,  0.23784462,  0.01354855, -1.6355
        294 ,
               -1.04420988,  0.61303888,  0.73620521,  1.02692144, -1.4321
        9061,
               -1.8411883 ,  0.36609323, -0.33177714, -0.68921798,  2.0346
        0756,
               -0.55071441,  0.75045333, -1.30699234,  0.58057334, -1.1045
        2309,
                0.69012147,  0.68689007, -1.56668753,  0.90497412,  0.7788
        224 ,
                0.42823287,  0.10887199,  0.02828363, -0.57882582, -1.1994
        512 ,
               -1.70595201,  0.36916396,  1.87657343, -0.37690335,  1.8319
        3608,
                0.00301743, -0.07602347,  0.00395759, -0.18501411, -2.4871
        5154])
```

In [10]:

```
plt.hist(data, rwidth=0.8)
plt.show()
```

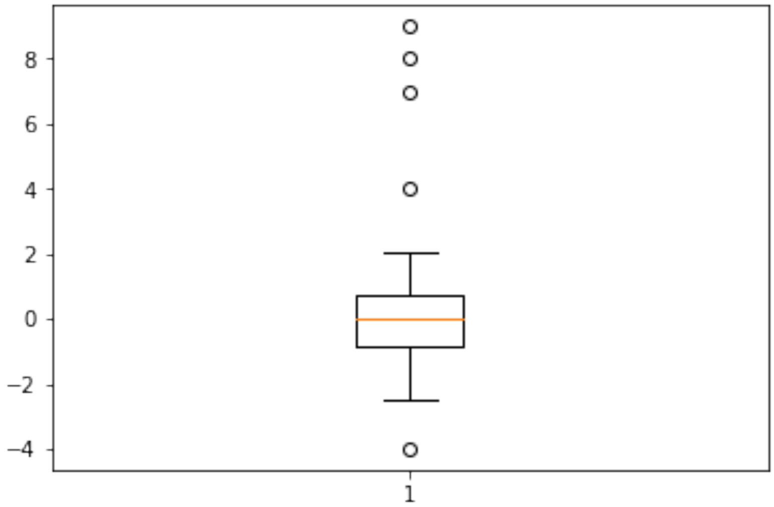


In [11]:

```
data = np.concatenate([data, [4, 7, 8, 9, -4]])
```

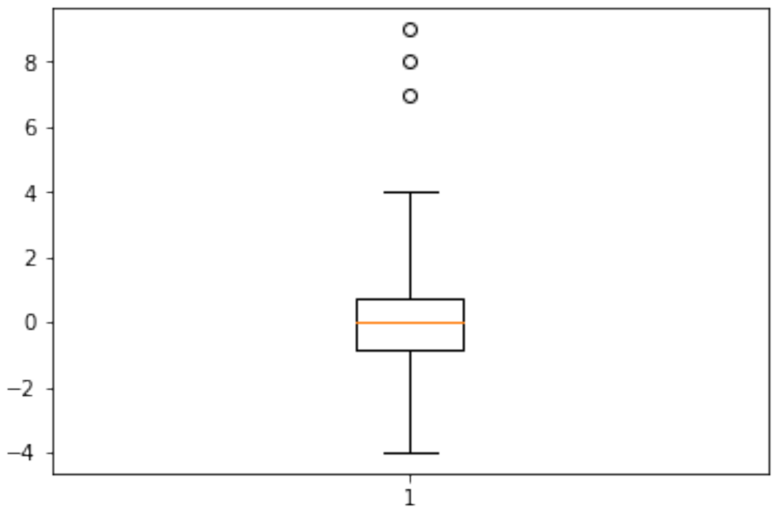
In [12]:

```
plt.boxplot(data)
plt.show()
```



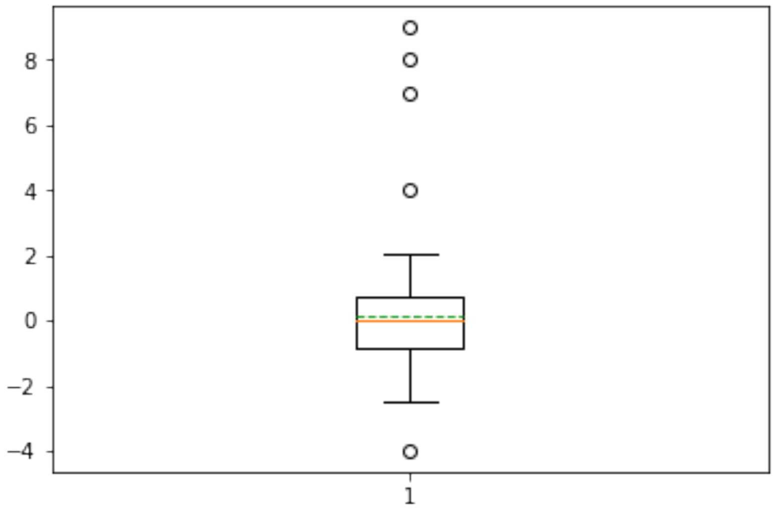
In [13]:

```
plt.boxplot(data, whis=3)       # whis默然为1.5倍
plt.show()
```



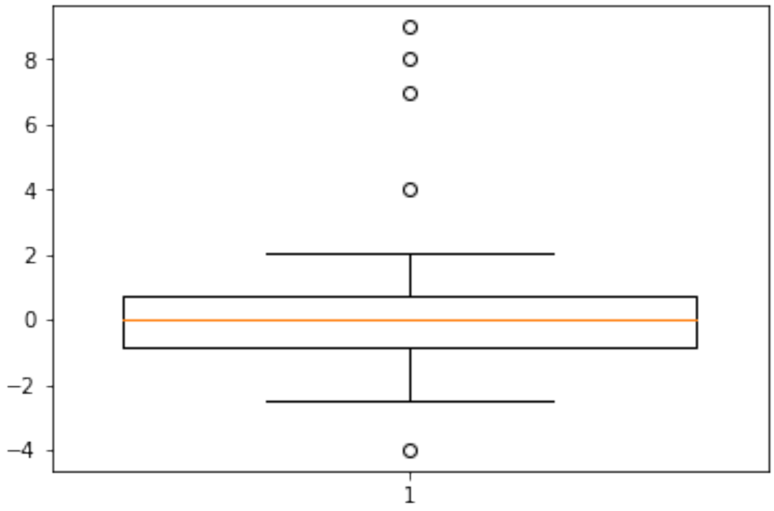
In [14]:

```
plt.boxplot(data, showmeans=True, meanline=True)
plt.show()
```



In [15]:

```
plt.boxplot(data, widths=0.8)
plt.show()
```



```
In [16]: plt.boxplot(data, showbox=False)
         plt.show()
```