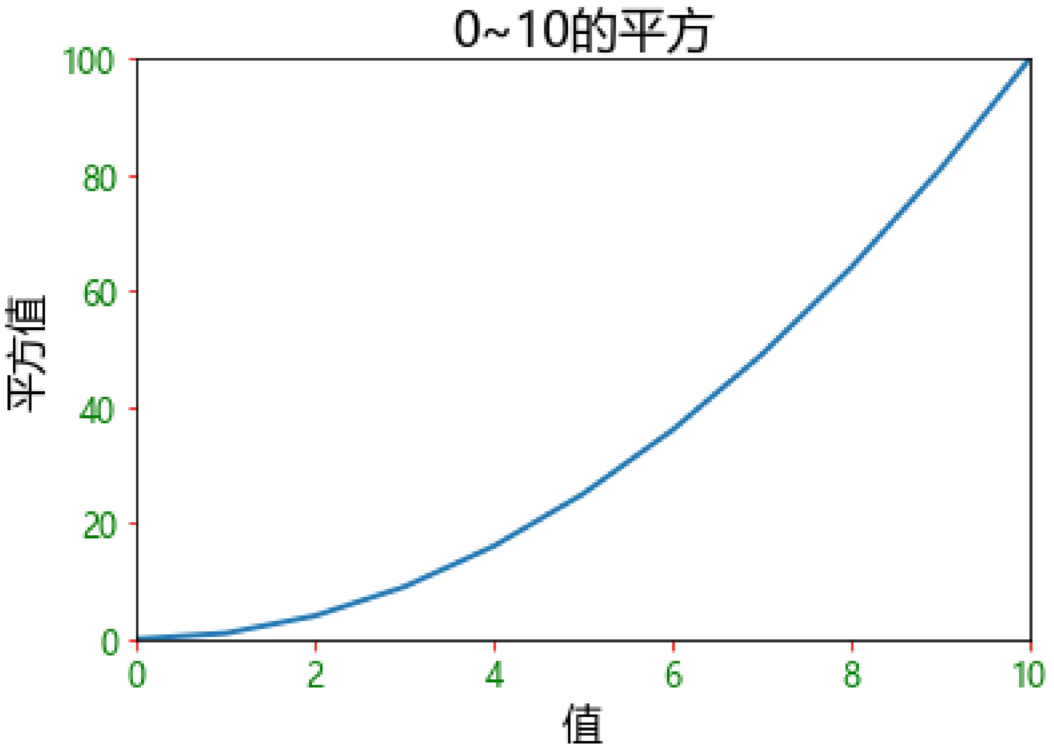
python_graph

January 8, 2023

[1]:
```
import matplotlib
import matplotlib.pyplot as plt

#
matplotlib.rc("font", family='Microsoft YaHei')

# 1.
squares = [0, 1, 4, 9, 16, 25, 36, 49, 64, 81, 100]

# 2. plot()
# linewidth
plt.plot(squares, linewidth=2)  #      y  x

# 3.  x y
plt.axis([0, 10, 0, 100])  #  x  0~10 y  0~100

# 4.
"""
title()   title(  ,fontsize=  )
xlabel() x
ylabel() y
"""
plt.title(label='0~10  ', fontsize=18)
plt.xlabel(xlabel=' ', fontsize=15)
plt.ylabel(ylabel='  ', fontsize=15)

# 5.
"""
 tick_params()
    -    axis x-->  x y-->  y both-->  x y
    -      labelsize
    -    color
 tick_params(axis='x', labelsize=10, color='green')
"""
plt.tick_params(axis='both', labelsize=12, color='red', labelcolor='green')

#
```

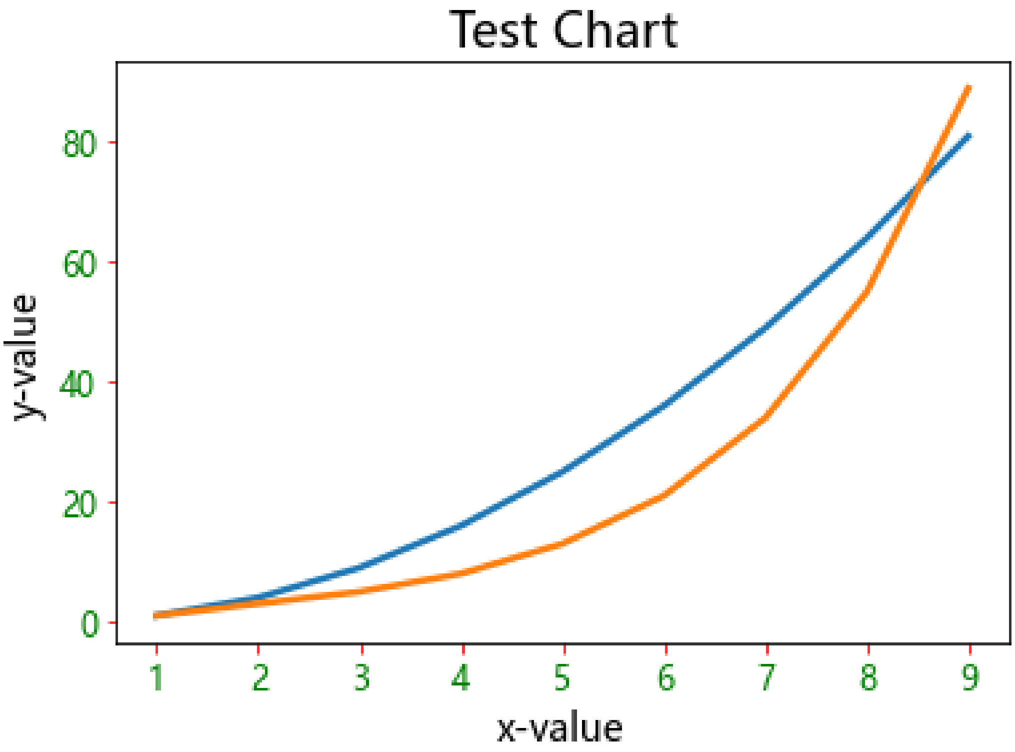
```
plt.show()
```



[2]:

```
import matplotlib
import matplotlib.pyplot as plt

matplotlib.rc("font", family="Microsoft YaHei")

data1 = [1, 4, 9, 16, 25, 36, 49, 64, 81]
data2 = [1, 3, 5, 8, 13, 21, 34, 55, 89]

seq = [1, 2, 3, 4, 5, 6, 7, 8, 9]

plt.plot(seq, data1, seq, data2, linewidth=2.5)

plt.title(label='Test Chart', fontsize=18)
plt.xlabel(xlabel='x-value', fontsize=14)
plt.ylabel(ylabel='y-value', fontsize=14)

# 5.
plt.tick_params(axis='both', labelsize=12, color='red', labelcolor='green')

#
```

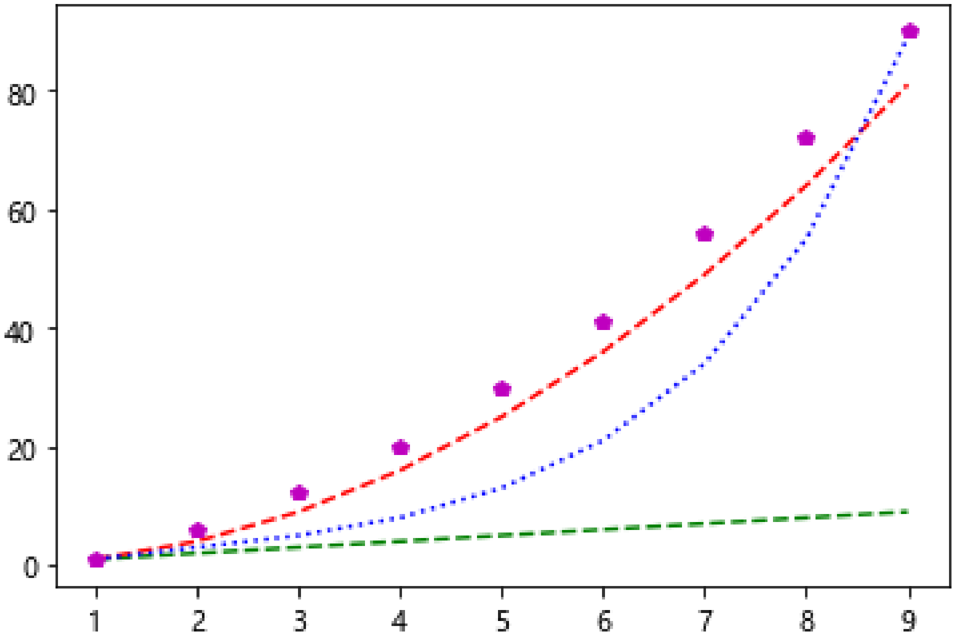
```
plt.show()
```



[3]:
```
import matplotlib.pyplot as plt
data1 = [1, 2, 3, 4, 5, 6, 7, 8, 9]
data2 = [1, 4, 9, 16, 25, 36, 49, 64, 81]
data3 = [1, 3, 5, 8, 13, 21, 34, 55, 89]
data4 = [1, 6, 12 ,20, 30, 41, 56, 72, 90]
```

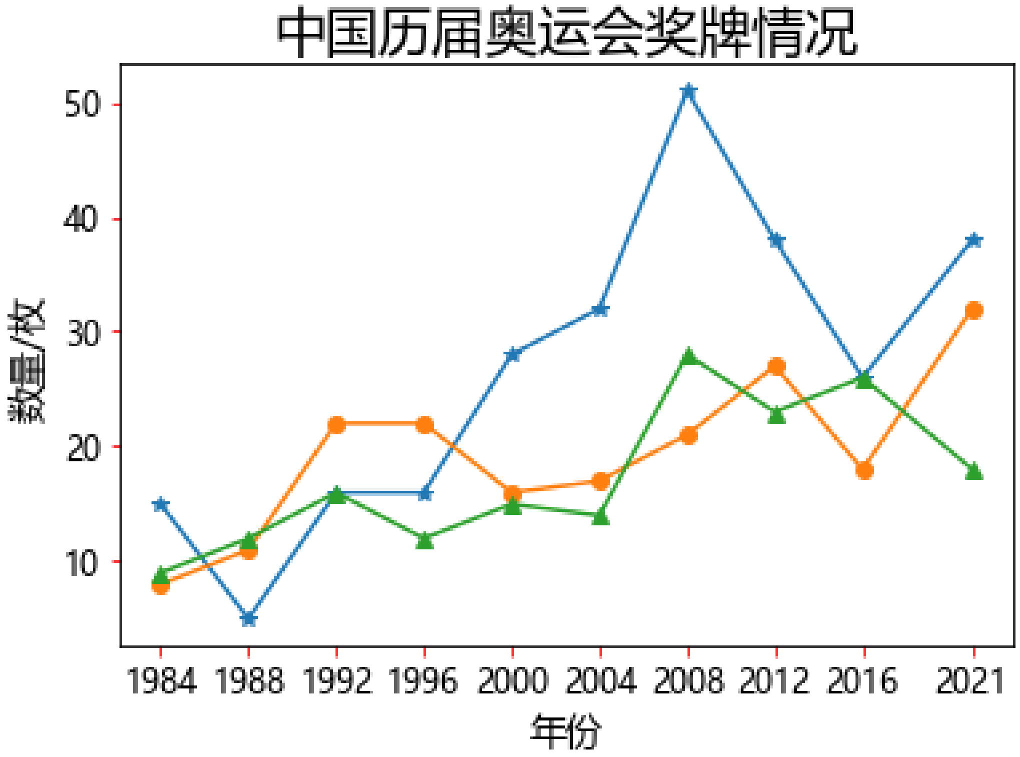
[4]:
```
seq = [1, 2, 3, 4, 5, 6, 7, 8, 9]
plt.plot(seq, data1, 'g--', seq, data2, 'r--', seq, data3, "b:", seq, data4,␣
 ↪'mp')
```

[4]:
```
[<matplotlib.lines.Line2D at 0x1b0ca743cd0>,
 <matplotlib.lines.Line2D at 0x1b0ca743e20>,
 <matplotlib.lines.Line2D at 0x1b0ca743df0>,
 <matplotlib.lines.Line2D at 0x1b0ca753070>]
```



[5]:

```
import matplotlib
import matplotlib.pyplot as plt

matplotlib.rc("font", family="Microsoft YaHei")

gold_medal = [15, 5, 16, 16, 28, 32, 51, 38, 26, 38]
silver_medal = [8, 11, 22, 22, 16, 17, 21, 27, 18, 32]
bronze_medal = [9, 12, 16, 12, 15, 14, 28, 23, 26, 18]

year = [1984, 1988, 1992, 1996, 2000, 2004, 2008, 2012, 2016, 2021]

plt.xticks(year)

plt.plot(year, gold_medal, '-*', year, silver_medal, '-o', year, bronze_medal,␣
 ↪'-^')
plt.title('      ', fontsize=20)
plt.xlabel(' ', fontsize=14)
plt.ylabel(' / ', fontsize=14)
#
plt.tick_params(axis='both', labelsize=12, color='red')
#
plt.show()
```

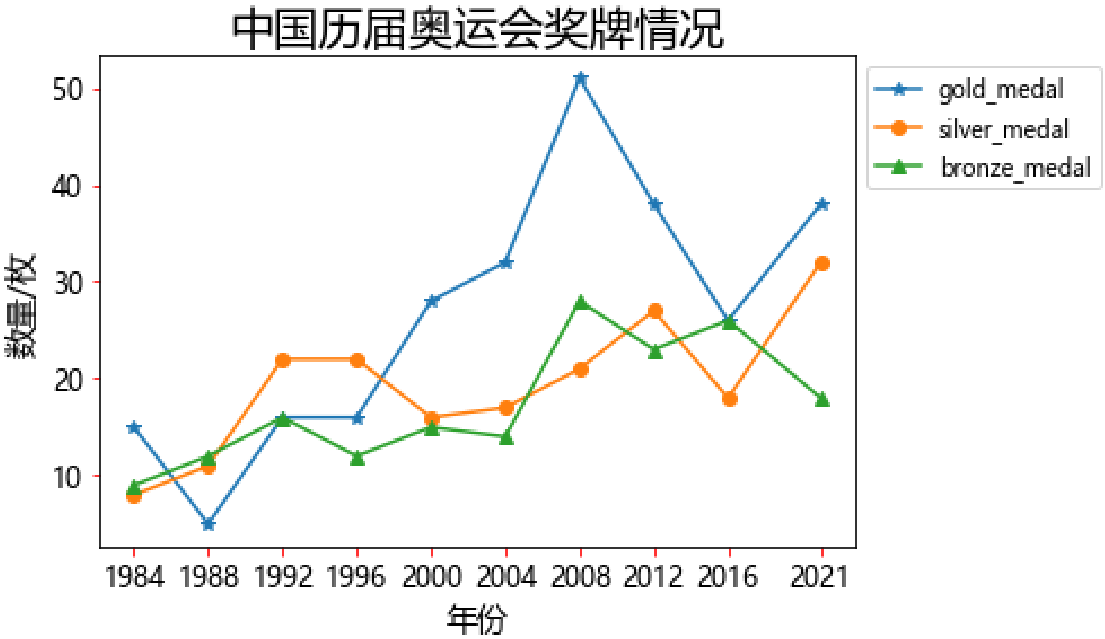


[6]:

```
import matplotlib
import matplotlib.pyplot as plt

#
matplotlib.rc("font", family='Microsoft YaHei')
# 1.
gold_medal = [15, 5, 16, 16, 28, 32, 51, 38, 26, 38]
silver_medal = [8, 11, 22, 22, 16, 17, 21, 27, 18, 32]
bronze_medal = [9, 12, 16, 12, 15, 14, 28, 23, 26, 18]

#
year = [1984, 1988, 1992, 1996, 2000, 2004, 2008, 2012, 2016, 2021]


"""

- xticks()  x
- yticks()  y
"""
#  x
plt.xticks(year)
```

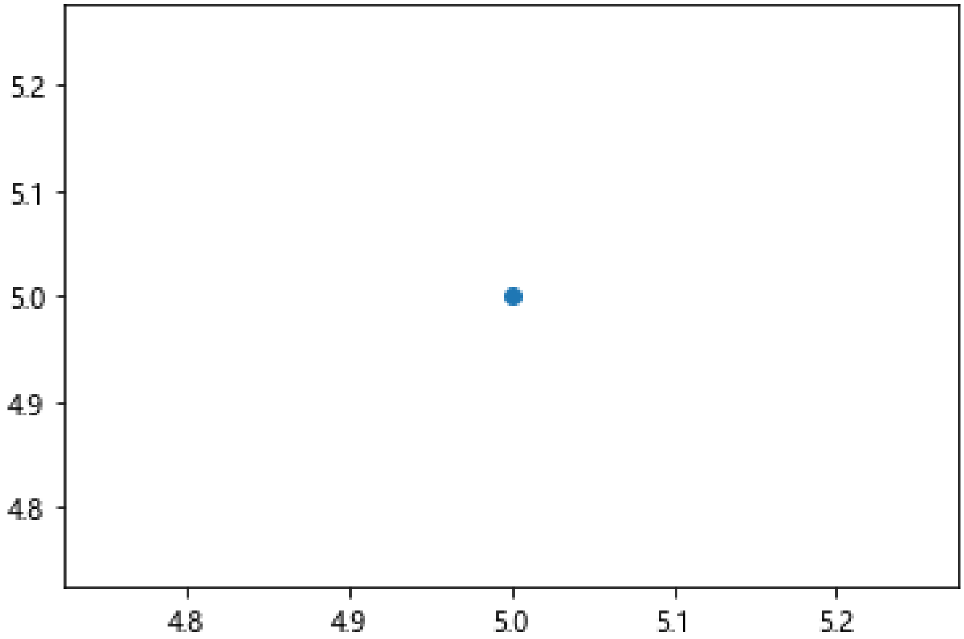
```
#
line_gold, = plt.plot(year, gold_medal, '-*', label='gold_medal')
line_silver, = plt.plot(year, silver_medal, '-o', label='silver_medal')
line_bronze, = plt.plot(year, bronze_medal, '-^', label='bronze_medal')

#
"""
 loc
     'best': 0,
     'upper right': 1,-->
     'upper left': 2,-->
     'lower left': 3,-->
     'lower right': 4,-->
     'right': 5,
     'center left': 6,-->
     'center right': 7,-->
     'lower center': 8,-->
     'upper center': 9,-->
     'center': 10
"""
plt.legend(handles=[line_gold, line_silver, line_bronze], loc='best',␣
 ↪bbox_to_anchor=(1, 1))
#
# plt.legend(handles=[line_gold, line_silver, line_bronze], loc=1)
#
# plt.legend(handles=[line_gold, line_silver, line_bronze], loc='upper left')
#
# plt.legend(handles=[line_gold, line_silver, line_bronze], loc=3)
#
# plt.legend(handles=[line_gold, line_silver, line_bronze], loc=4)

#
# plt.legend(handles=[line_gold, line_silver, line_bronze], loc='center left')
#
# plt.legend(handles=[line_gold, line_silver, line_bronze], loc='center right')
#
# plt.legend(handles=[line_gold, line_silver, line_bronze], loc='lower center')
#
# plt.legend(handles=[line_gold, line_silver, line_bronze], loc='upper center')

#
plt.title('      ', fontsize=20)
plt.xlabel(' ', fontsize=14)
plt.ylabel(' / ', fontsize=14)
#
plt.tick_params(axis='both', labelsize=12, color='red')
#
```

```
plt.show()
```



[7]:
```
import matplotlib.pyplot as plt
plt.scatter(5, 5)
```

[7]:
```
<matplotlib.collections.PathCollection at 0x1b0ca8aeac0>
```

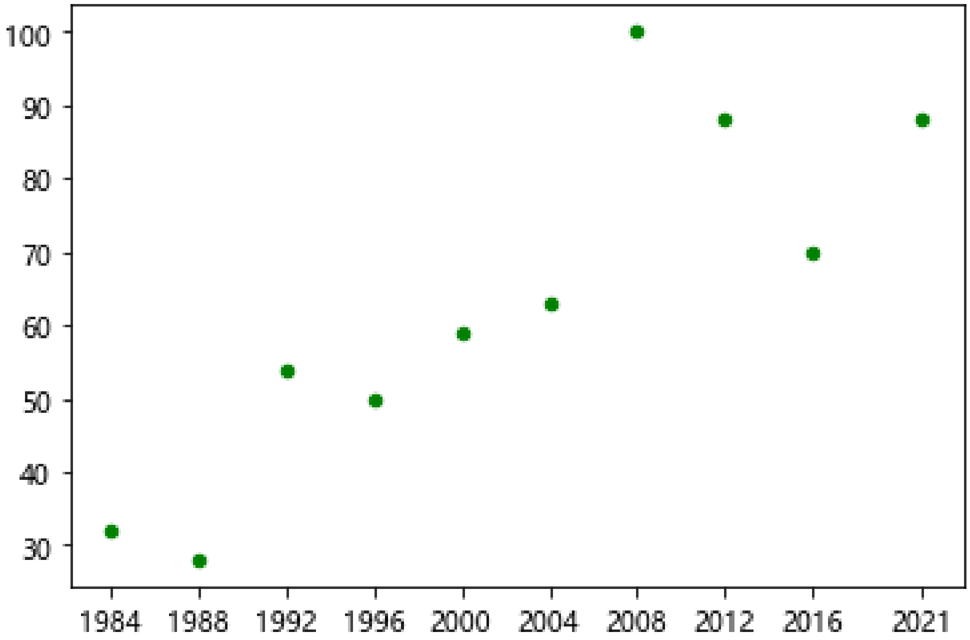


[8]:

```python
import matplotlib.pyplot as plt
plt.rcParams['font.sans-serif'] = ['SimHei']
plt.rcParams['axes.unicode_minus'] = False

medal = [32, 28, 54, 50, 59, 63, 100, 88, 70, 88]
year = [1984, 1988, 1992, 1996, 2000, 2004, 2008, 2012, 2016, 2021]

plt.xticks(year)
plt.scatter(x=year, y=medal, s=20, c='green')
```

[8]:

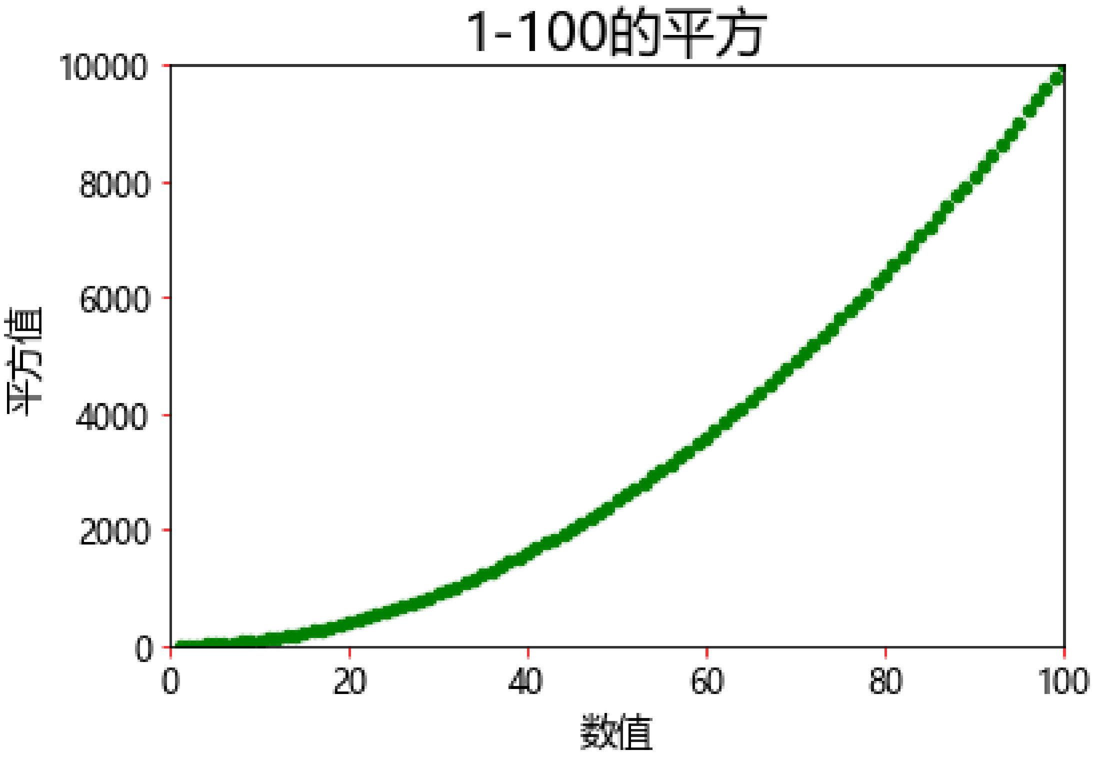
```
<matplotlib.collections.PathCollection at 0x1b0ca8eb7f0>
```



[9]:

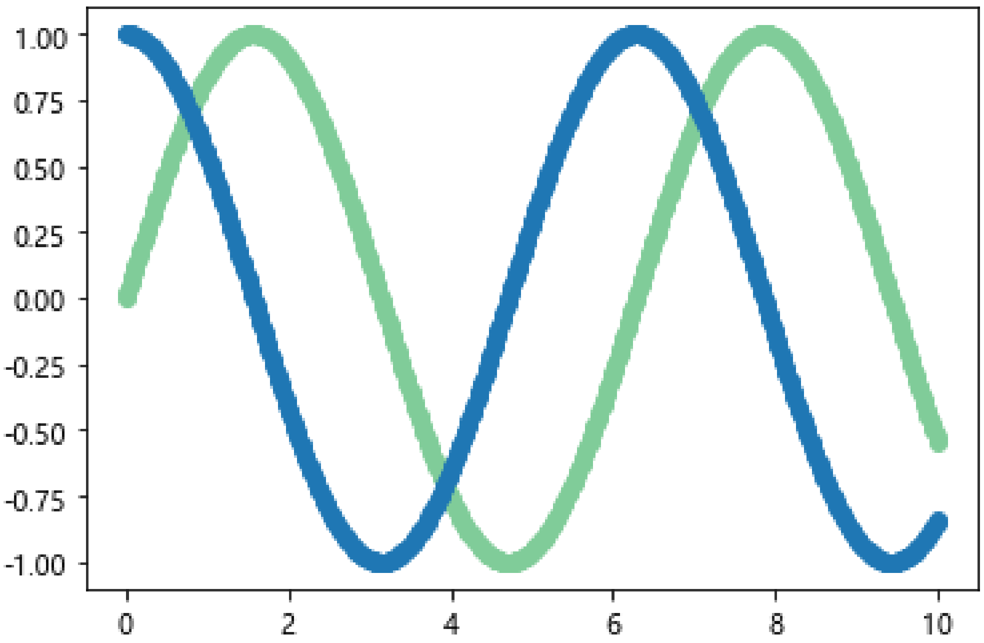
```python
import matplotlib.pyplot as plt

plt.rcParams['font.sans-serif'] = ['SimHei']
plt.rcParams['axes.unicode_minus'] = False

x = [i for i in range(1, 101)]
y = [i**2 for i in x]

#
plt.axis([0, 100, 0, 10000])
plt.scatter(x=x, y=y, s=20, c='green')
```

```
#
plt.title('1-100  ', fontsize=20)
plt.xlabel(' ', fontsize=14)
plt.ylabel('  ', fontsize=14)
#
plt.tick_params(axis='both', labelsize=12, color='red')
plt.show()
```



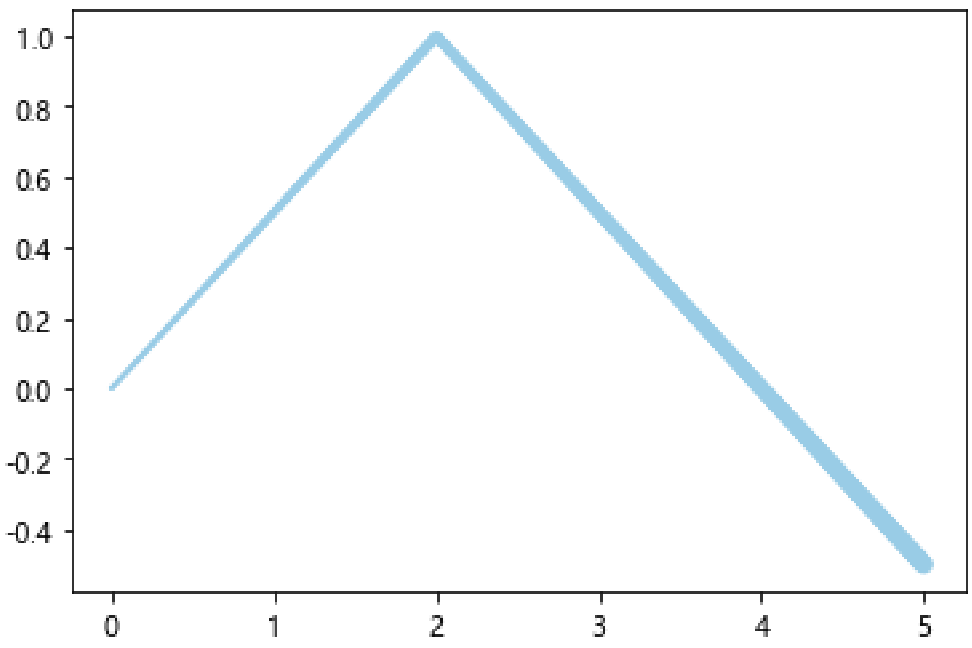
[10]:

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

x = np.linspace(0, 10, 500)

y1 = np.sin(x)
y2 = np.cos(x)
plt.scatter(x, y1, color=(0.5, 0.8, 0.6))
plt.scatter(x, y2)
plt.show()
```



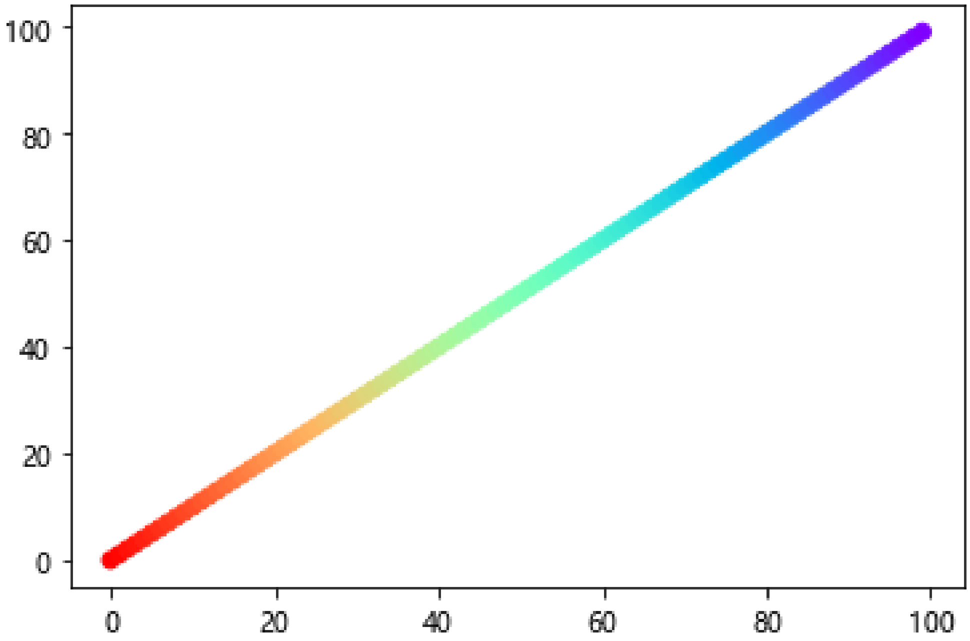
[11]:

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

x = np.linspace(0, 5, 500)
y = 1 - 0.5*np.abs(x-2)
lwidths = (1+x)**2
plt.scatter(x=x, y=y, s=lwidths, color=(0.6, 0.8, 0.9))
plt.show()
```



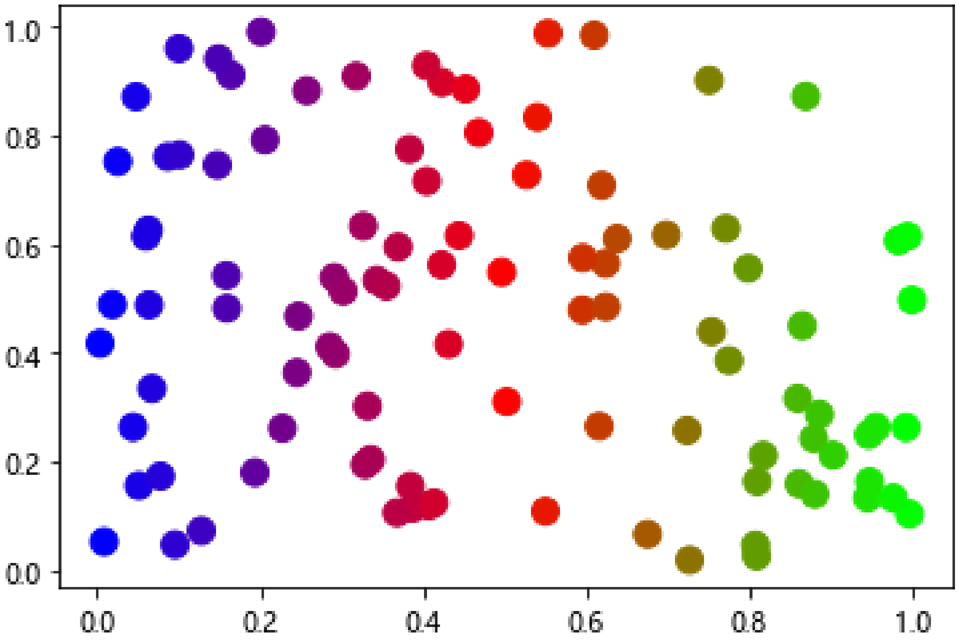
```
[12]: import matplotlib.pyplot as plt
      import numpy as np

      x = np.arange(100)
      plt.scatter(x=x, y=x, c=100-x, cmap='rainbow')
```

```
[12]: <matplotlib.collections.PathCollection at 0x1b0cba9ca90>
```



[13]:

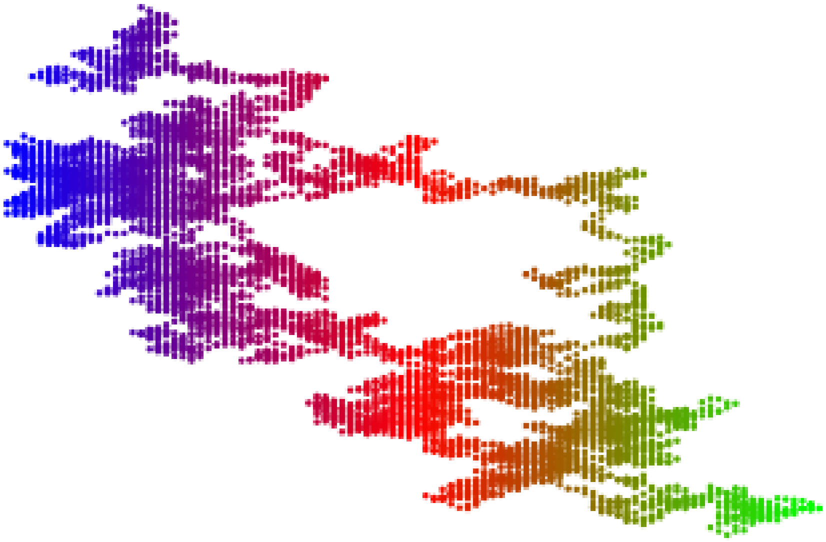
```python
import matplotlib.pyplot as plt
import numpy as np
while True:
    x = np.random.random(100)
    y = np.random.random(100)
    t = x
    plt.scatter(x, y, s=100, c=t, cmap='brg')
    plt.show()
    is_exit = input('continue?(y/n)')
    if is_exit.upper() == 'N':
        break
```



```
continue?(y/n)n
```

[14]:

```python
import random
import matplotlib.pyplot as plt

def loc(index):
    x_mov = random.choice([-3, 3])
    xloc = x[index - 1] + x_mov
    y_mov = random.choice([-5, -1, 1, 5])
    yloc = y[index - 1] + y_mov
    x.append(xloc)
    y.append(yloc)

num = 8000
x = [0]
y = [0]

while True:
    for i in range(1, num):
        loc(i)

    t = x
    plt.scatter(x, y, s=2, c=t, cmap='brg')
    plt.axis('off')
    plt.savefig('image.png', bbox_inches='tight', pad_inches=0)
    plt.show()
    is_exit = input('  (y/n)')
    if is_exit.upper() == 'N':
        break
    else:
        x[0] = x[num-1]
        y[0] = y[num-1]
        del x[1:]
        del y[1:]
```

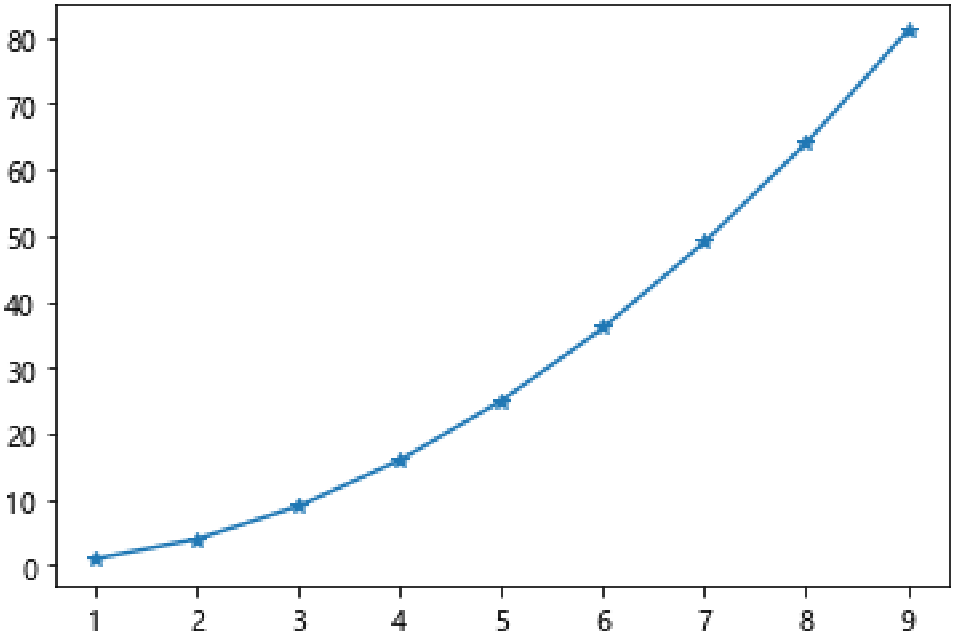


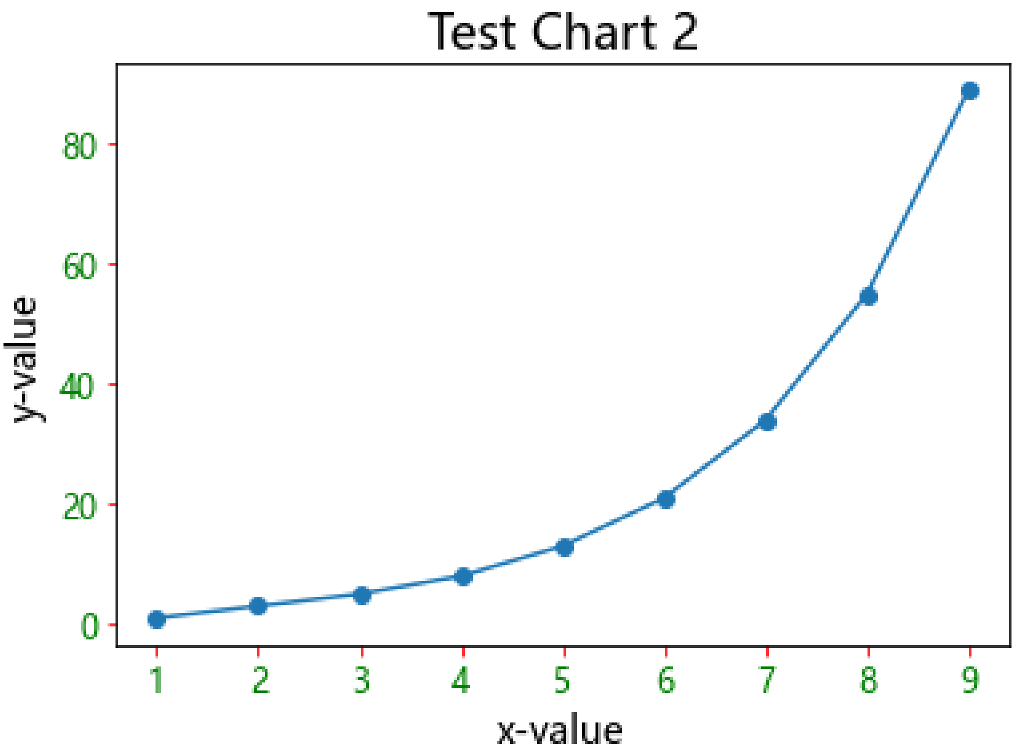
```
  (y/n)n
```

[15]:

```
import matplotlib.pyplot as plt

# 1.
data1 = [1, 4, 9, 16, 25, 36, 49, 64, 81]
data2 = [1, 3, 5, 8, 13, 21, 34, 55, 89]

#
seq = [1, 2, 3, 4, 5, 6, 7, 8, 9]



#   1
plt.figure(1)
#  plot()
plt.plot(seq, data1, '-*')

#   2
```

```
plt.figure(2)
plt.plot(seq, data2, '-o')
#
plt.title(label='Test Chart 2', fontsize=18)
plt.xlabel(xlabel='x-value', fontsize=14)
plt.ylabel(ylabel='y-value', fontsize=14)

# 5.
plt.tick_params(axis='both', labelsize=12, color='red', labelcolor='green')

#
plt.show()
```

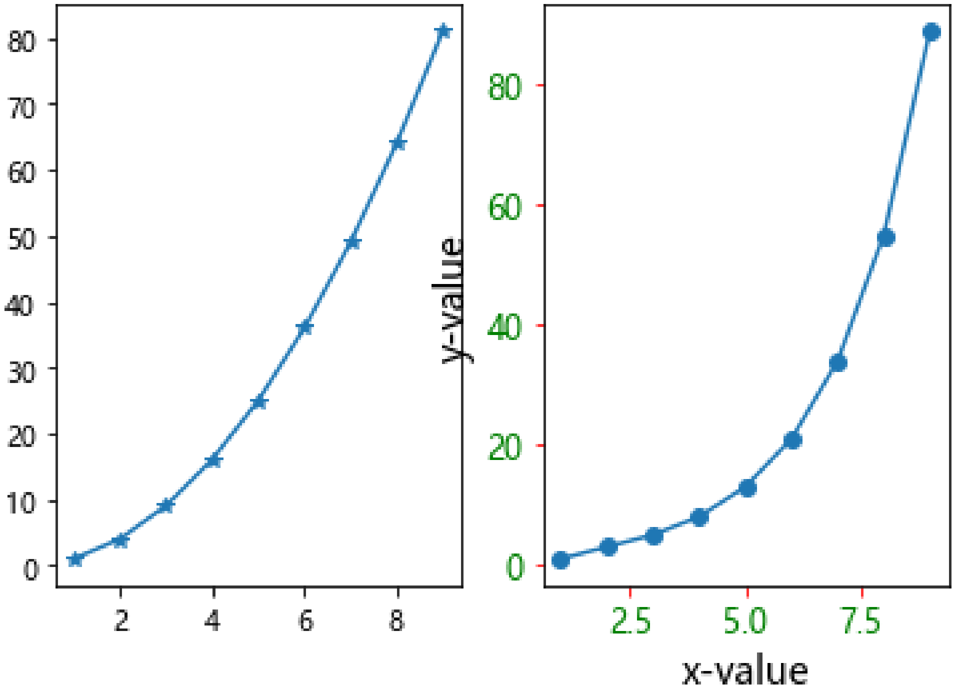




[16]:

```
"""
subplot(x1, x2, x3)
x1:
x2
x3
"""
import matplotlib.pyplot as plt

# 1.
data1 = [1, 4, 9, 16, 25, 36, 49, 64, 81]
data2 = [1, 3, 5, 8, 13, 21, 34, 55, 89]

#
seq = [1, 2, 3, 4, 5, 6, 7, 8, 9]

#   Figure
plt.subplot(1, 2, 1)
#  plot()
plt.plot(seq, data1, '-*')

plt.subplot(1, 2, 2)
plt.plot(seq, data2, '-o')
```

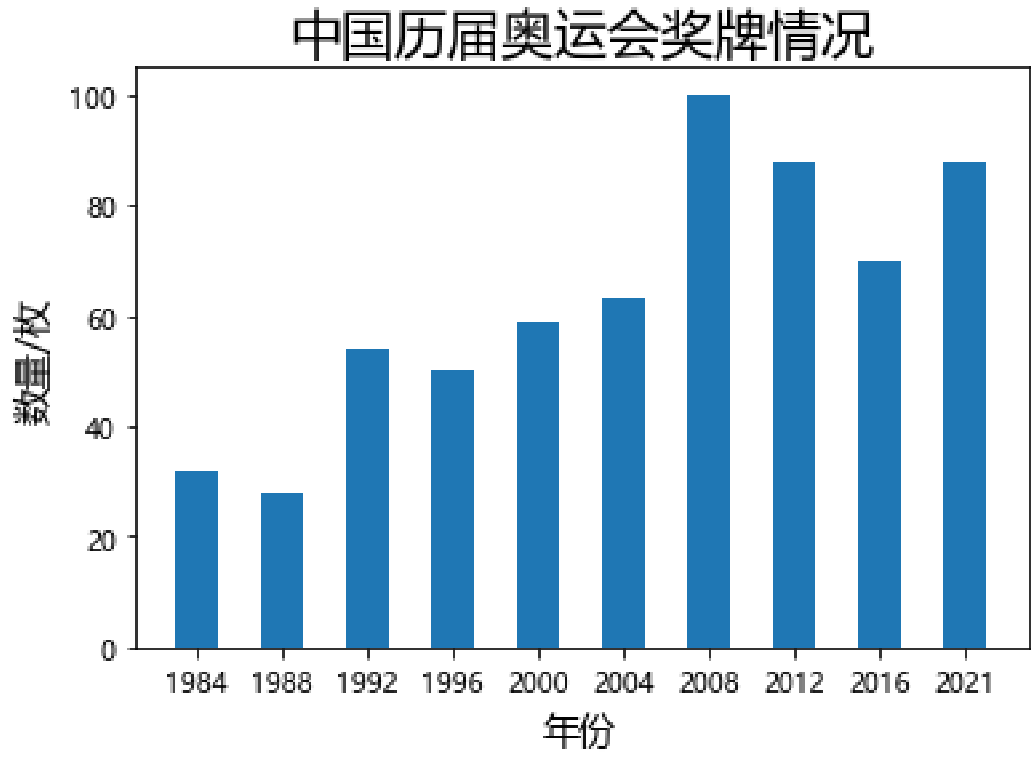
```
#
plt.xlabel(xlabel='x-value', fontsize=14)
plt.ylabel(ylabel='y-value', fontsize=14)

#
plt.tick_params(axis='both', labelsize=12, color='red', labelcolor='green')

#
plt.show()
```



[18]:

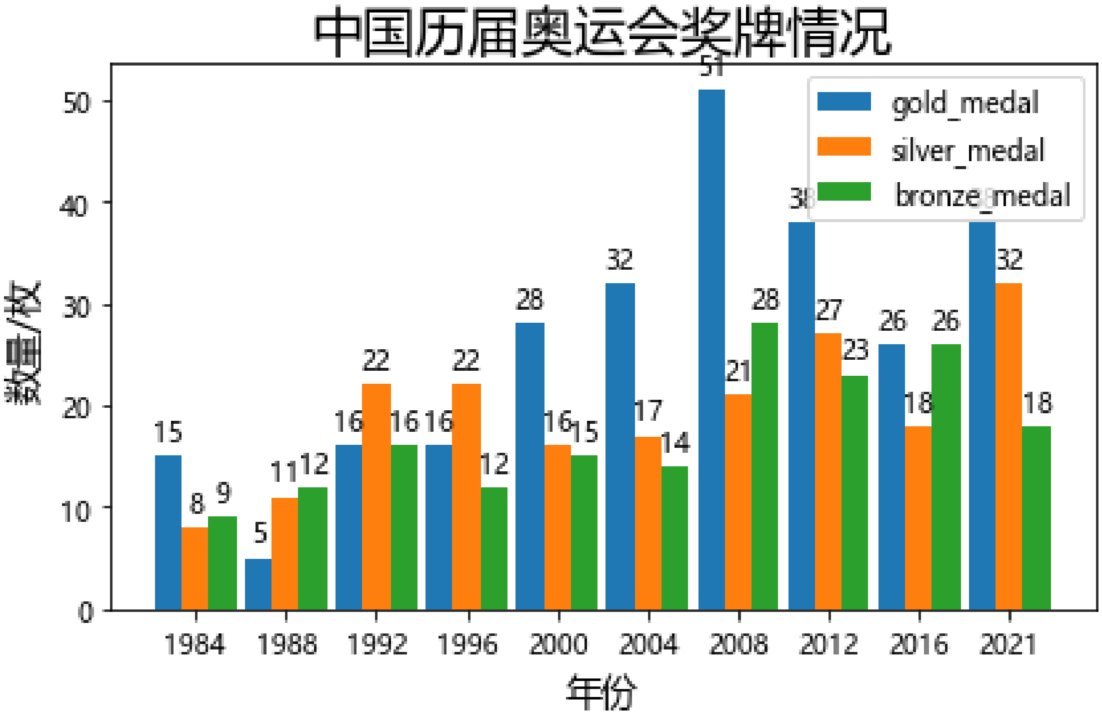
```
import matplotlib.pyplot as plt
import numpy as np

plt.rcParams['font.sans-serif'] = ['SimHei']
plt.rcParams['axes.unicode_minus'] = False

medal = [32, 28, 54, 50, 59, 63, 100, 88, 70, 88]
x = np.arange(len(medal))

year = [1984, 1988, 1992, 1996, 2000, 2004, 2008, 2012, 2016, 2021]

plt.bar(x, medal, width=0.5)
plt.title('      ', fontsize=20)
plt.xlabel(' ', fontsize=14)
plt.ylabel(' / ', fontsize=14)
plt.xticks(x, year)
```

```
[18]: ([<matplotlib.axis.XTick at 0x1b0cbb76220>,
        <matplotlib.axis.XTick at 0x1b0cbb761f0>,
        <matplotlib.axis.XTick at 0x1b0cbb6d400>,
        <matplotlib.axis.XTick at 0x1b0cbbbb0a0>,
        <matplotlib.axis.XTick at 0x1b0cbbbb6d0>,
        <matplotlib.axis.XTick at 0x1b0cbbbbe20>,
        <matplotlib.axis.XTick at 0x1b0cbbc05b0>,
        <matplotlib.axis.XTick at 0x1b0cbbc0d00>,
        <matplotlib.axis.XTick at 0x1b0cbbc0df0>,
        <matplotlib.axis.XTick at 0x1b0cbbbbe50>],
       [Text(0, 0, '1984'),
        Text(1, 0, '1988'),
        Text(2, 0, '1992'),
        Text(3, 0, '1996'),
        Text(4, 0, '2000'),
        Text(5, 0, '2004'),
        Text(6, 0, '2008'),
        Text(7, 0, '2012'),
        Text(8, 0, '2016'),
        Text(9, 0, '2021')])
```



[42]:

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

plt.rcParams['font.sans-serif'] = ['SimHei']
plt.rcParams['axes.unicode_minus'] = False

# 1.
labels = [1984, 1988, 1992, 1996, 2000, 2004, 2008, 2012, 2016, 2021]
gold_medal = [15, 5, 16, 16, 28, 32, 51, 38, 26, 38]
silver_medal = [8, 11, 22, 22, 16, 17, 21, 27, 18, 32]
bronze_medal = [9, 12, 16, 12, 15, 14, 28, 23, 26, 18]

x = np.arange(len(labels))  # x
width = 0.3  #

fig, ax = plt.subplots()
rects1 = ax.bar(x - width, gold_medal, width, label='gold_medal')
rects2 = ax.bar(x, silver_medal, width, label='silver_medal')
rects3 = ax.bar(x + width, bronze_medal, width, label='bronze_medal')

#
ax.set_xlabel(' ', fontsize=14)
ax.set_ylabel(' / ', fontsize=14)
ax.set_title('      ', fontsize=20)
ax.set_xticks(x, labels)
#

ax.bar_label(rects1, padding=3)
ax.bar_label(rects2, padding=3)
ax.bar_label(rects3, padding=3)

ax.legend()

plt.tight_layout()

plt.show()
```


中国历届奥运会奖牌情况
gold_medal
silver_medal
bronze_medal
数量/枚
0
10
20
30
40
50
15
8
9
5
11
12
16
22
16
16
22
12
28
16
15
32
17
14
51
21
28
38
27
23
26
18
26
38
32
18
1984
1988
1992
1996
2000
2004
2008
2012
2016
2021
年份

[ ]: