Data Visualization with Matplotlib - Exercises

จงทำตามคำสั่งต่อไปนี้ด้วย data ที่กำหนดให้ต่อไปนี้

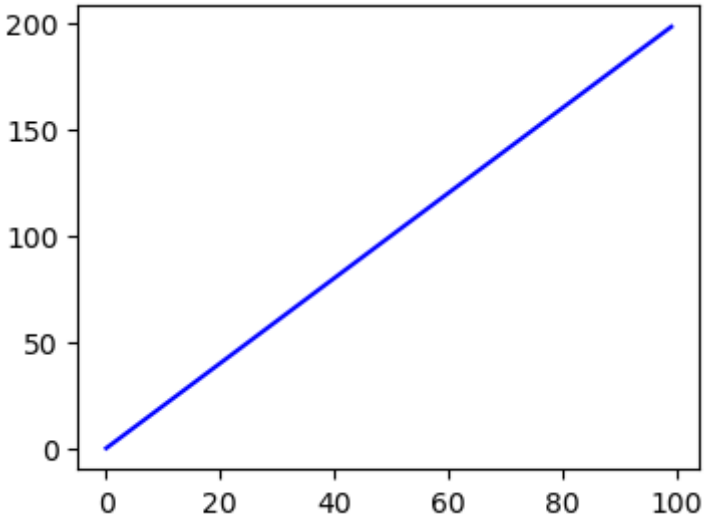
Data

In [1]:
```
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
x = np.arange(0,100)
y = x*2
z = x**2
df = pd.read_excel('Superstore.xls')
```

Exercise 1

In [2]:
```
plt.figure(figsize=(4,3))
plt.plot(x , y , 'b')
```

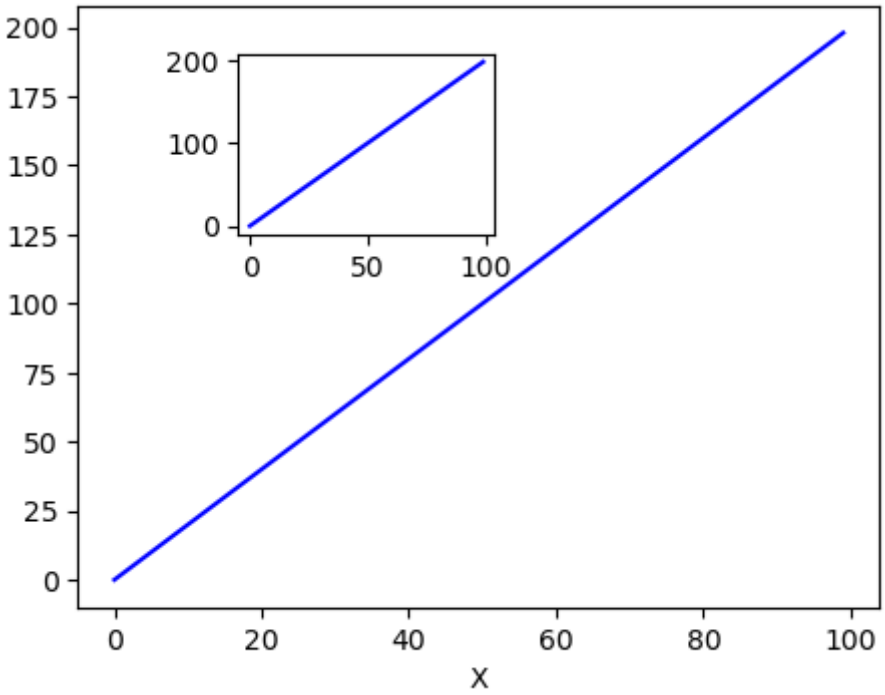
Out[2]:
```
[<matplotlib.lines.Line2D at 0x19373286a00>]
```



Exercise 2

In [3]:
```
fig = plt.figure(figsize=(4,3))
ax = fig.add_axes([0,0,1,1])
ax.set_xlabel('X')
ax.plot(x,y,'b')

ax2 = fig.add_axes([0.2,0.62,0.32,0.3])
ax2.plot(x,y,'b')
```

Out[3]:
```
[<matplotlib.lines.Line2D at 0x19372a61730>]
```

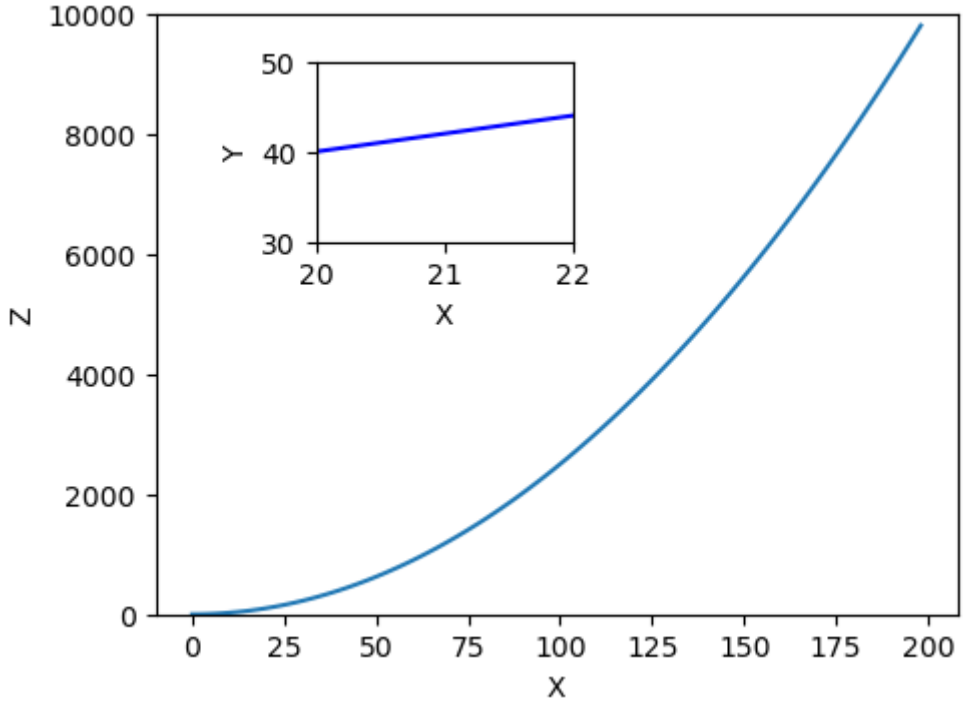


Exercise 3

ใช้ arrays x, y และ z เพื่อทำการ plot บนแกนที่สร้างจากข้อที่แล้ว (Notice อย่าลืมกำหนด x - limits และ y - limits)

In [4]:
```
fig = plt.figure(figsize=(4,3), dpi=100)
ax = fig.add_axes([0,0,1,1])
ax.set_ylabel('Z')
ax.set_xlabel('X')
ax.set_ylim([0,10000])
ax.plot(y, z)

ax2 = fig.add_axes([0.2,0.62,0.32,0.3])
ax2.set_ylim([30,50])
ax2.set_xlim([20,22])
ax2.set_xlabel('X')
ax2.set_ylabel('Y')
ax2.plot(x,y,'b')
```

Out[4]:
```
[<matplotlib.lines.Line2D at 0x19373141a30>]
```

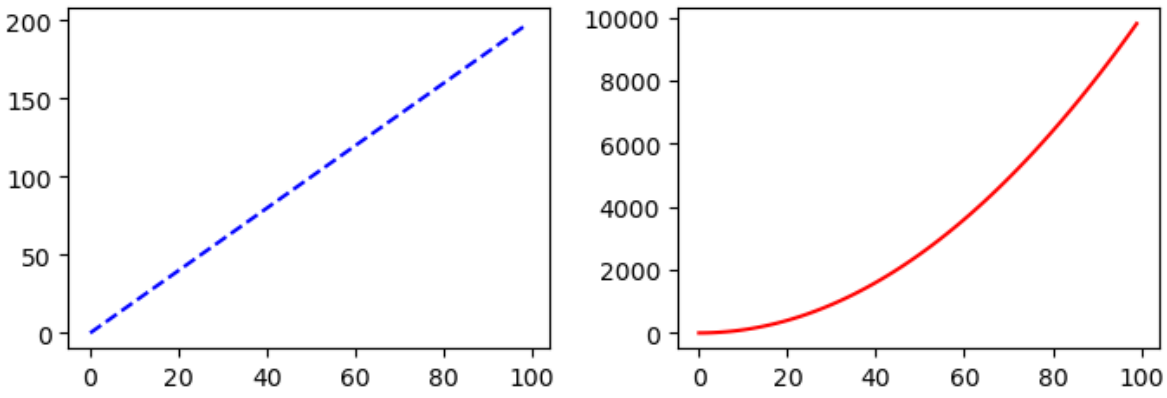


Exercise 4

จงใช้คำสั่ง plt.subplots(nrows=1, ncols=2)

จากนั้นให้ทำการ plot (x,y) และ plot (x,z) บนแกน axes และให้ใช้งานคำสั่ง linewidth and style เพื่อตกแต่งเส้นของกราฟ

In [6]:
```
fig, axes = plt.subplots(nrows=1, ncols=2, figsize=(7,2.5))
axes[0].plot(x,y,'b--')
axes[1].plot(x,z,'r')

fig.tight_layout()
```



Exercise 5

In [10]:
```
df.head()
```

Out[10]:

	Order ID	Customer Name	Segment	Day	Month	Year	Ship Mode	City	State	Category	
0	CA-2016-152156	Claire Gute	Consumer	8	11	2016	Second Class	Henderson	Kentucky	Furniture	B
1	CA-2016-152156	Claire Gute	Consumer	8	11	2016	Second Class	Henderson	Kentucky	Furniture	
2	CA-2016-138688	Darrin Van Huff	Corporate	12	6	2016	Second Class	Los Angeles	California	Office Supplies	
3	US-2015-108966	Sean O'Donnell	Consumer	11	10	2015	Standard Class	Fort Lauderdale	Florida	Furniture	
4	US-2015-108966	Sean O'Donnell	Consumer	11	10	2015	Standard Class	Fort Lauderdale	Florida	Office Supplies	

In [175…
```
df.info()
```

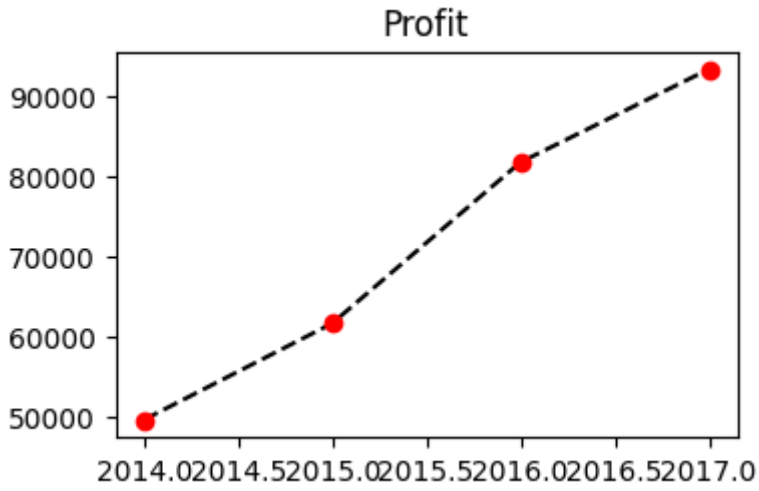
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9994 entries, 0 to 9993
Data columns (total 16 columns):
 #   Column         Non-Null Count  Dtype  
---  ------         --------------  -----  
 0   Order ID       9994 non-null   object 
 1   Customer Name  9994 non-null   object 
 2   Segment        9994 non-null   object 
 3   Day            9994 non-null   int64  
 4   Month          9994 non-null   int64  
 5   Year           9994 non-null   int64  
 6   Ship Mode      9994 non-null   object 
 7   City           9994 non-null   object 
 8   State          9994 non-null   object 
 9   Category       9994 non-null   object 
 10  Sub-Category   9994 non-null   object 
 11  Product Name   9994 non-null   object 
 12  Sales          9994 non-null   float64
 13  Quantity       9994 non-null   int64  
 14  Discount       9994 non-null   float64
 15  Profit         9994 non-null   float64
dtypes: float64(3), int64(4), object(9)
memory usage: 1.2+ MB
```

จงแสดงกราฟรายได้ของทุกปี

In [12]:
```
df1 = df.groupby('Year')['Profit'].sum()
a = df1.index
```

```
b = df1
```

In [177…
```
plt.figure(figsize=(4,2.5))
plt.title('Profit')
plt.plot(a,b, marker='o', mfc="r", mec="r", linestyle='--', color='#000000', label=
plt.show()
```



In [ ]:
```
```

โค้ดต่อไปนี้ใช้ในสองข้อสุดท้าย

In [178…
```
df['Category'].unique()
```

Out[178]:
```
array(['Furniture', 'Office Supplies', 'Technology'], dtype=object)
```

In [7]:
```
df[ df['Category'] == 'Furniture' ].groupby('Year').sum()['Profit']
```

Out[7]:
```
Year
2014    5457.7255
2015    3015.2029
2016    6959.9531
2017    3018.3913
Name: Profit, dtype: float64
```

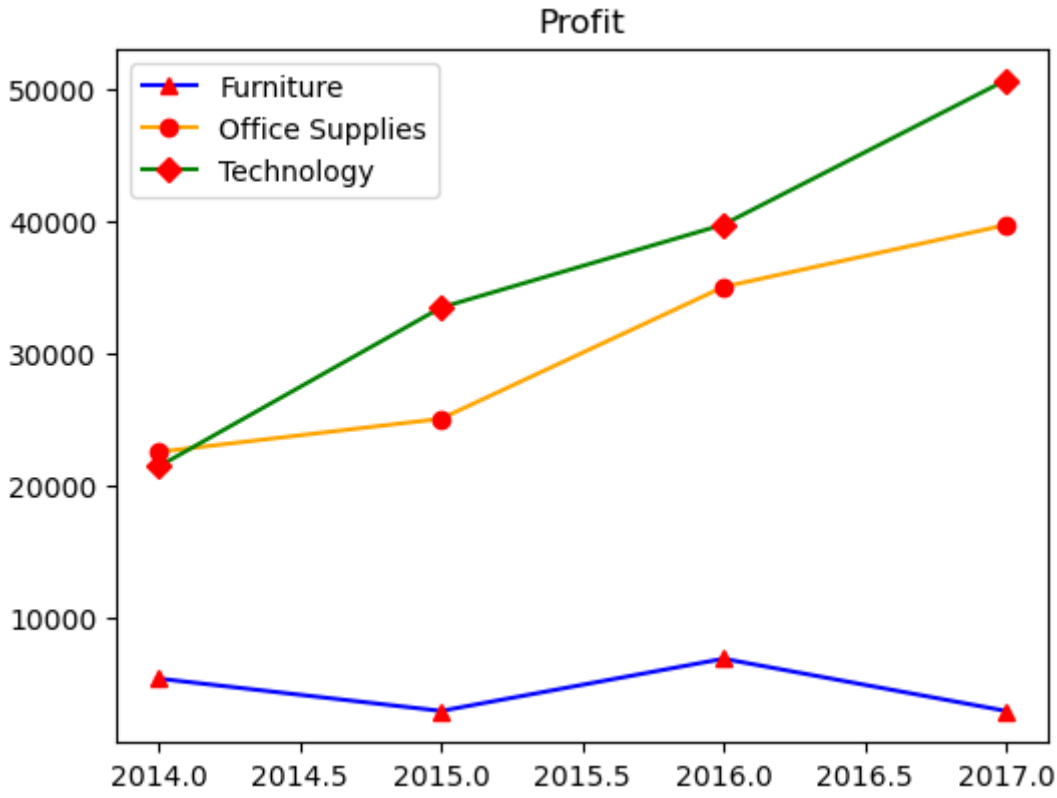
Dictionary of Category

In [8]:
```
arr_df = {}
for i in range(0,df['Category'].nunique()) :
    arr_df[df['Category'].unique()[i]] = df[ df['Category'] == df['Category'].uniq
```

จงแสดงกราฟรายได้ของแต่ละ Category ในแต่ละปีในกราฟเดียว

In [13]:
```
plt.figure(figsize=(6,4.5), dpi=100)
plt.title('Profit')
plt.plot(a,arr_df['Furniture'], marker='^', mfc="r", mec="r", color='b', label='Fu
plt.plot(a,arr_df['Office Supplies'], marker='o', mfc="r", mec="r", color='orange'
plt.plot(a,arr_df['Technology'], marker='D', mfc="r", mec="r", color='g', label='T
plt.legend()
```

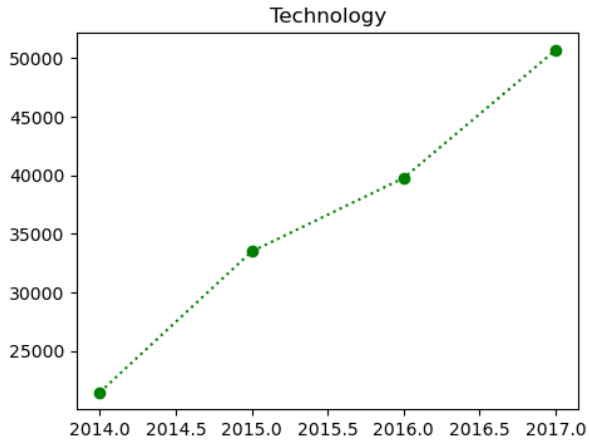
Out[13]:
```
<matplotlib.legend.Legend at 0x19372c745e0>
```

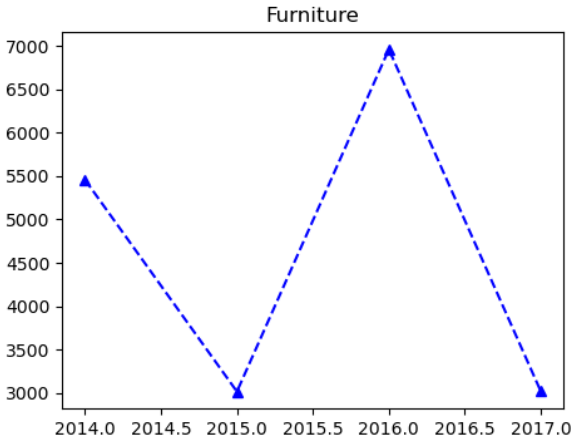


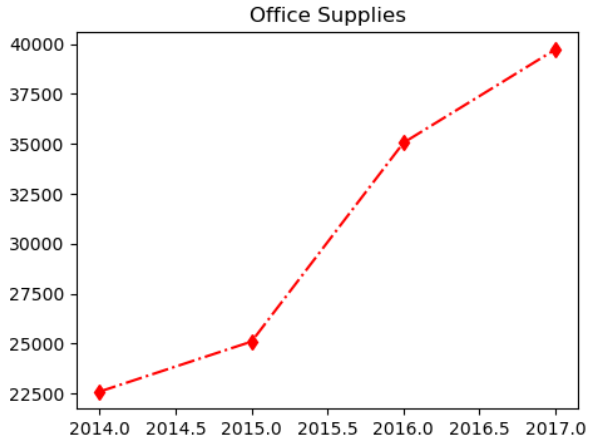
จงแสดงกราฟรายได้ของแต่ละ Category ในแต่ละปี แบบแยกกราฟ

In [26]:
```
fig = plt.figure(figsize=(4,3))
ax = fig.add_axes([0,0,1,1])
ax.plot(a,arr_df['Furniture'],'^--b', label='Furniture')
ax.set_title('Furniture')

ax2 = fig.add_axes([1.2,0,1,1])
ax2.plot(a,arr_df['Office Supplies'],'d-.r', label='Office Supplies')
ax2.set_title('Office Supplies')

ax3 = fig.add_axes([0.6,1.3,1,1])
ax3.plot(a,arr_df['Technology'],'o:g', label='Technology')
ax3.set_title('Technology')
```

Out[26]:
```
Text(0.5, 1.0, 'Technology')
```


Technology
50000
45000
40000
35000
30000
25000
2014.0
2014.5
2015.0
2015.5
2016.0
2016.5
2017.0


Furniture
7000
6500
6000
5500
5000
4500
4000
3500
3000
2014.0
2014.5
2015.0
2015.5
2016.0
2016.5
2017.0


Office Supplies
40000
37500
35000
32500
30000
27500
25000
22500
2014.0
2014.5
2015.0
2015.5
2016.0
2016.5
2017.0

In [ ]: