Data Visualization with Matplotlib - Exercises

จงทำตามคำสั่งต่อไปนี้ด้วย data ที่กำหนดให้ต่อไปนี้

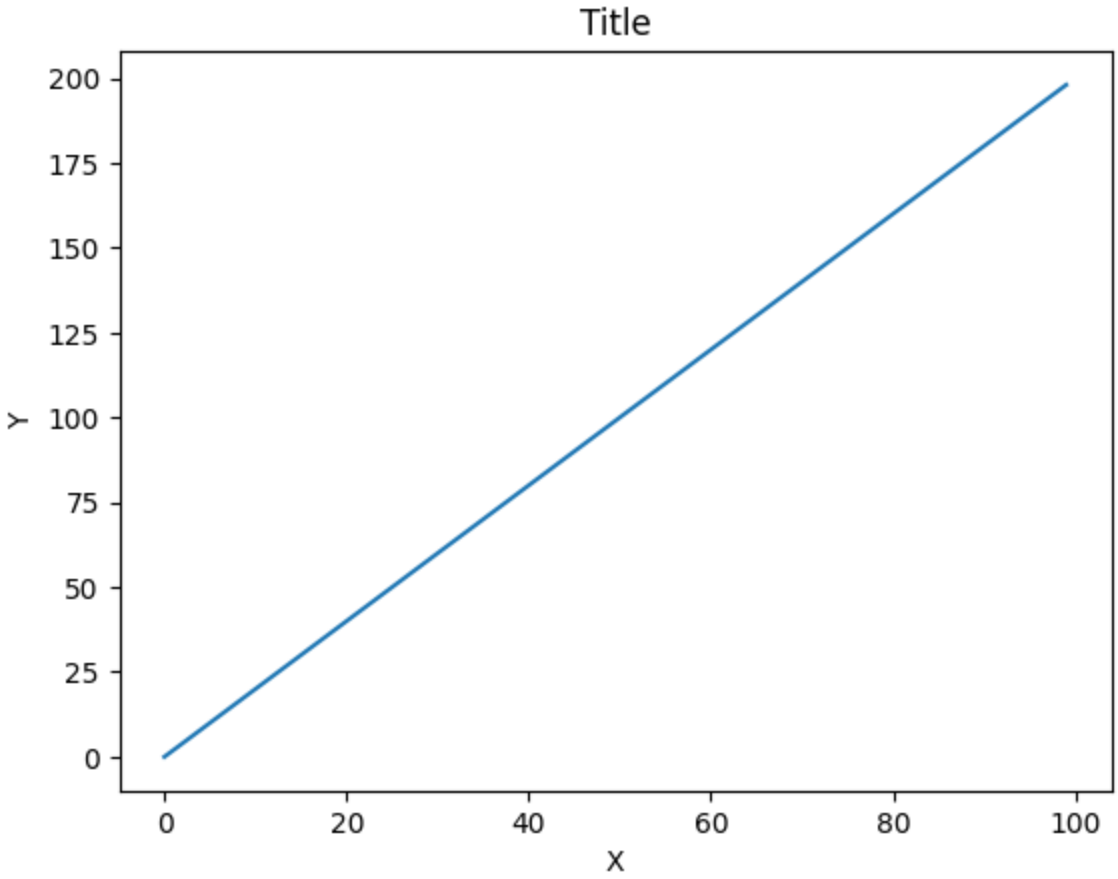
Data

In [ ]:
```
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_csv('Superstore.csv',encoding = 'iso-8859-1')
```

Exercise 1

In [ ]:
```
plt.plot(x, y)
plt.title('Title')
plt.xlabel('X')
plt.ylabel('Y')
```

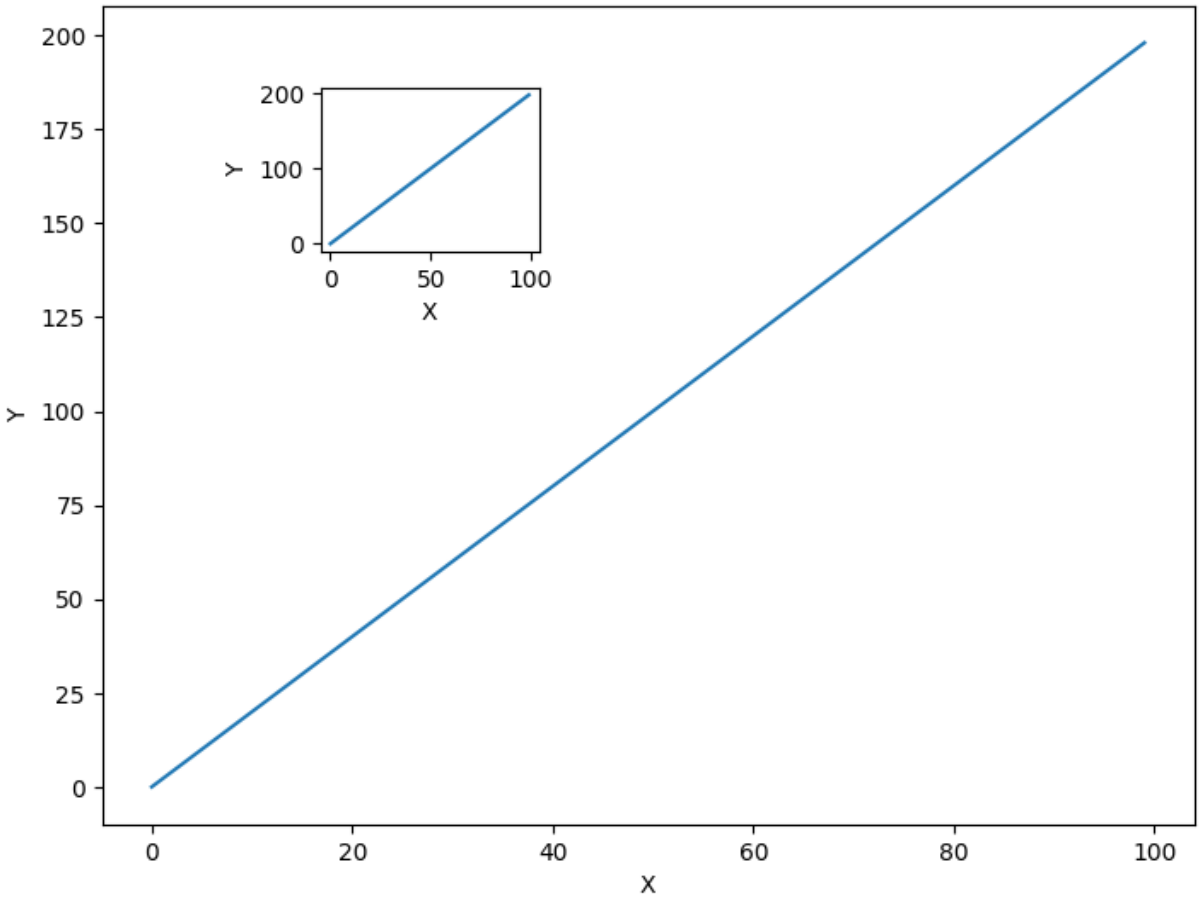
Out[ ]:
```
Text(0, 0.5, 'Y')
```



Exercise 2

In [ ]:
```
fig = plt.figure()
axes1 = fig.add_axes([0,0,1,1])
axes1.plot(x, y)
axes1.set_xlabel('X')
axes1.set_ylabel('Y')

axes2 = fig.add_axes([0.2,0.7,0.2,0.2])
axes2.plot(x, y)
axes2.set_xlabel('X')
axes2.set_ylabel('Y')
```

Out[ ]:
```
Text(0, 0.5, 'Y')
```

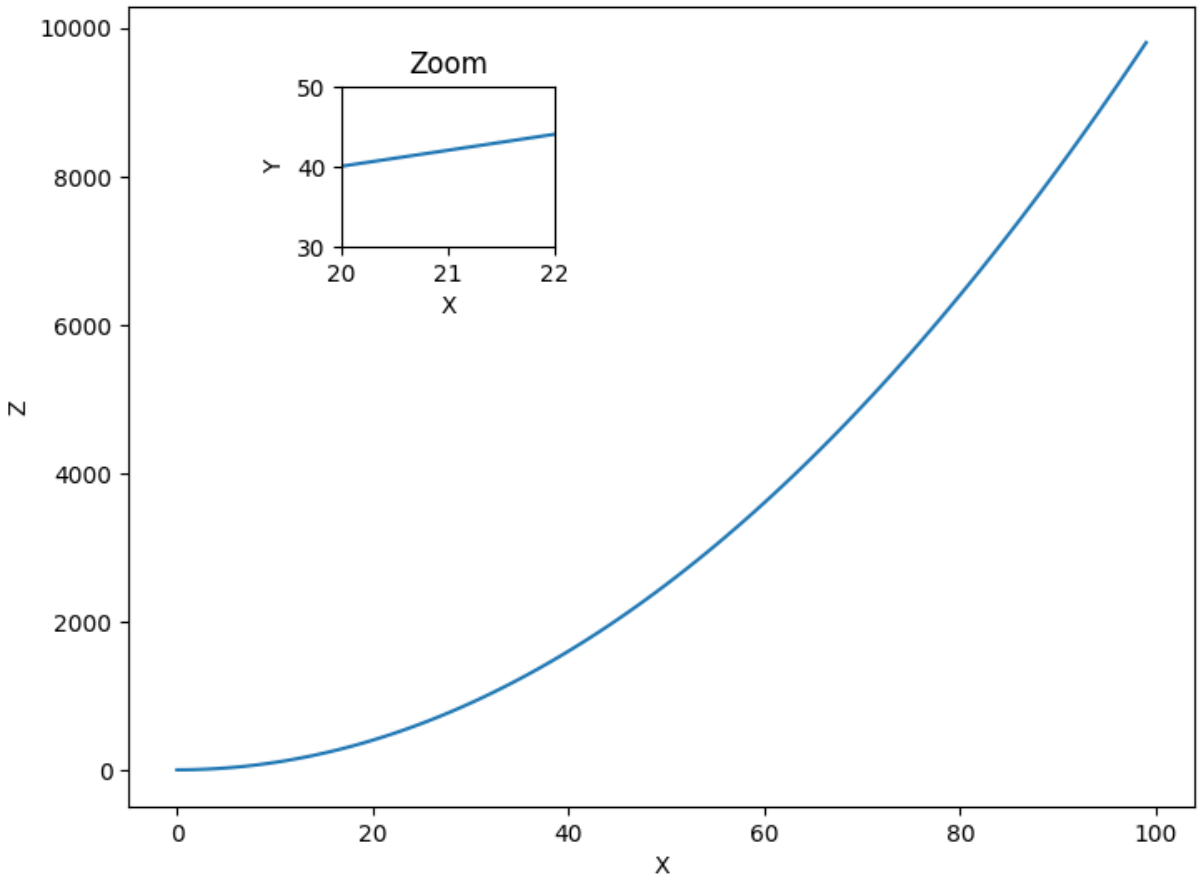


Exercise 3

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

In [ ]:
```
fig = plt.figure()
axes1 = fig.add_axes([0,0,1,1])
axes1.plot(x,z)
axes1.set_xlabel('X')
axes1.set_ylabel('Z')

axes2 = fig.add_axes([0.2,0.7,0.2,0.2])
axes2.plot(x,y)
plt.title('Zoom')
axes2.set_xlim(20,22)
axes2.set_ylim(30,50)
axes2.set_xlabel('X')
axes2.set_ylabel('Y')
```

Out[ ]:
```
Text(0, 0.5, 'Y')
```

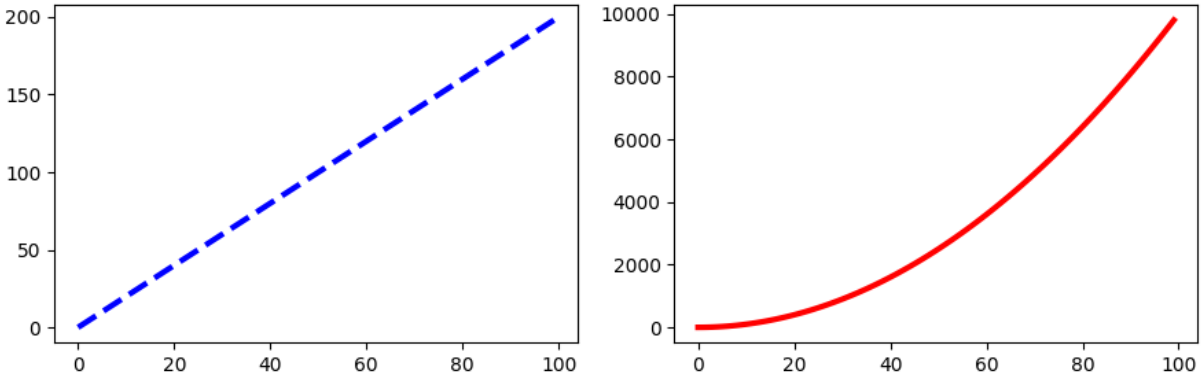


Exercise 4

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

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

In [ ]:
```
fig, axes = plt.subplots( nrows = 1, ncols = 2, figsize = (9,3))
axes[0].plot(x, y, '--b', lw=3)
axes[0].set_xticks(np.arange(0, 101, 20))
axes[0].set_yticks(np.arange(0, 201, 50))

axes[1].plot(x, z, 'r', lw=3)
axes[1].set_xticks(np.arange(0, 101, 20))
axes[1].set_yticks(np.arange(0, 10001, 2000))
fig.tight_layout()
```



Exercise 5

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

Out[ ]:

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

In [ ]:
```
df.info()
```

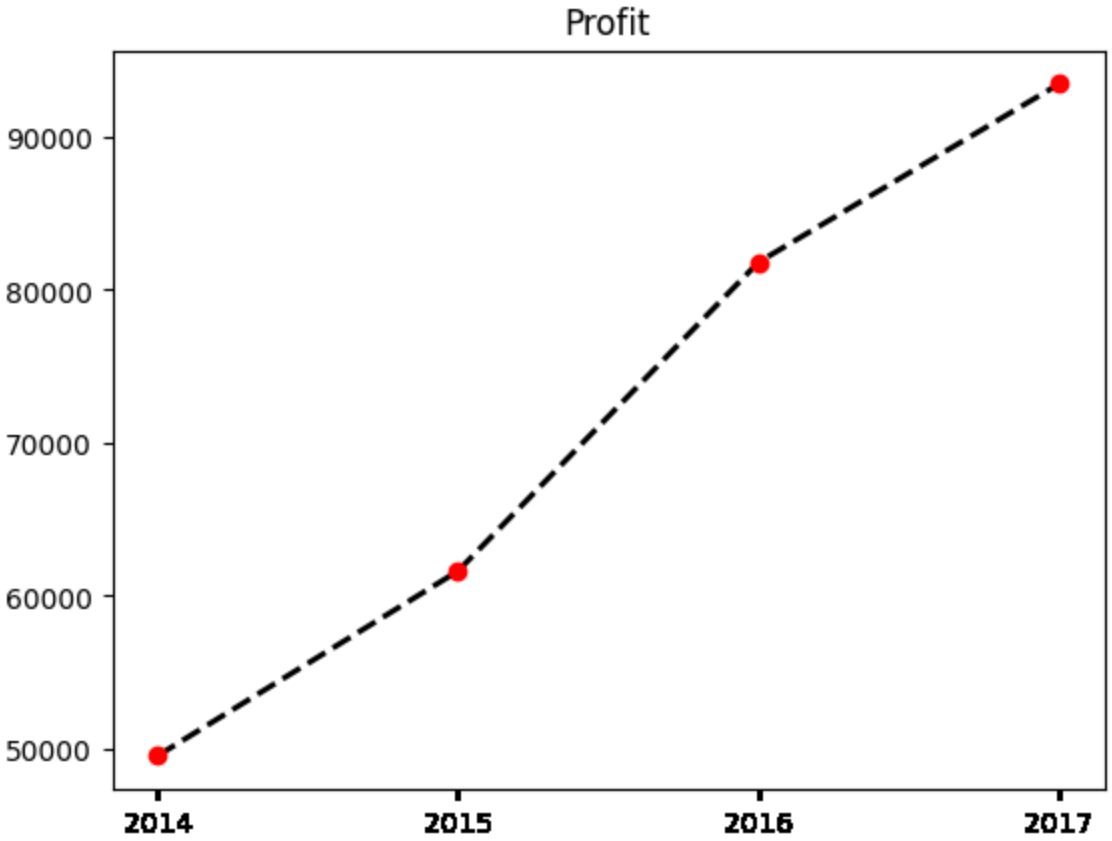
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9994 entries, 0 to 9993
Data columns (total 16 columns):
 #   Column         Non-Null Count  Dtype  
---  ------         --------------  -----  
 0   Order ID       9994 non-null   object 
 1   Customer Name  9994 non-null   object 
 2   Segment        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 [ ]:
```
df1 = df.groupby('Year')['Profit'].sum()
a = df1.index
b = df1
```

In [ ]:
```
plt.plot(a, b, '--k', marker='o', mfc='r', mec='r', lw=2)
plt.xticks(df['Year'])
plt.title('Profit')
```

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



โค้ดต่อไปนี้ใช้ในสองข้อสุดท้าย

In [ ]:
```
df['Category'].unique()
```

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

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

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

Dictionary of Category

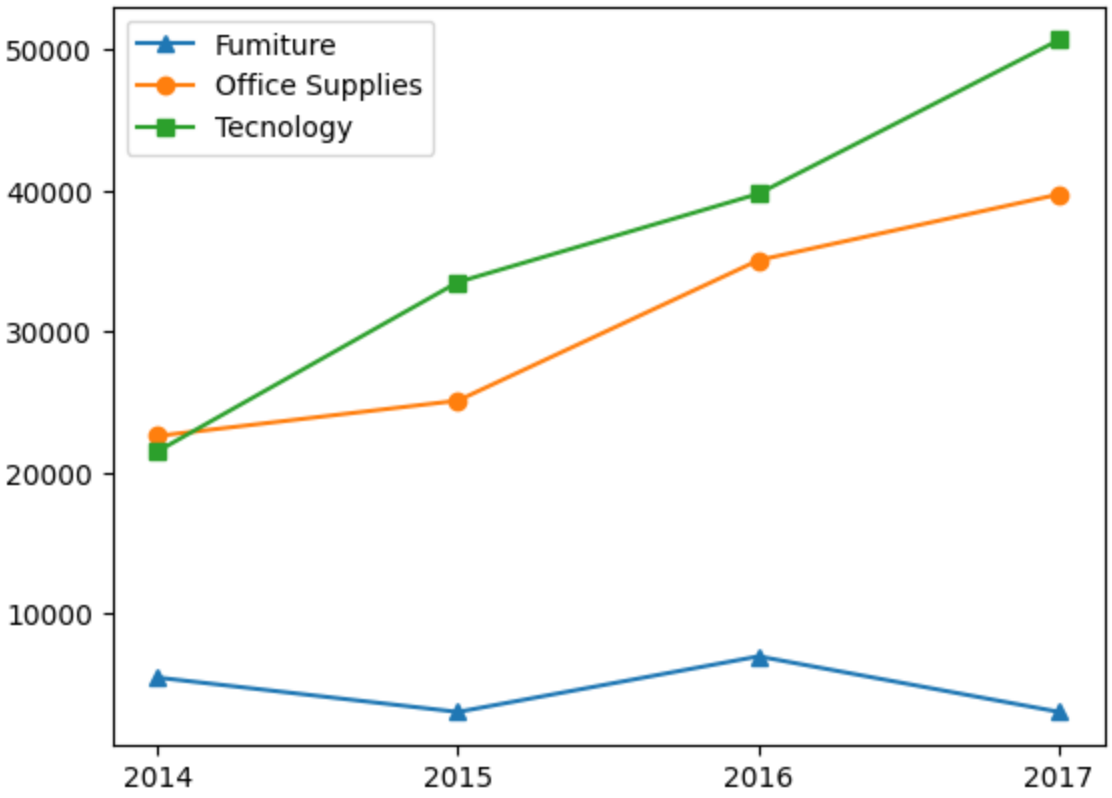
In [ ]:
```
arr_df = {}
for i in range(0,df['Category'].nunique()) :
    arr_df[df['Category'].unique()[i]] = df[ df['Category'] == df['Category'].uniqu
```

In [ ]:
```
x = arr_df['Furniture'].index
g = arr_df['Furniture']
y = arr_df['Office Supplies']
z = arr_df['Technology']
```

จงแสดงกราฟรายได้ของแต่ละ Category ในแต่ละปีในกราฟเดียว

In [ ]:
```
plt.plot(x, g, '^-', label = 'Fumiture')
plt.plot(x, y, 'o-', label = 'Office Supplies')
plt.plot(x, z, 's-', label = 'Tecnology')
plt.xticks([2014, 2015, 2016, 2017])
plt.legend(loc = 'best')
```

Out[ ]:
```
<matplotlib.legend.Legend at 0x1e993609710>
```

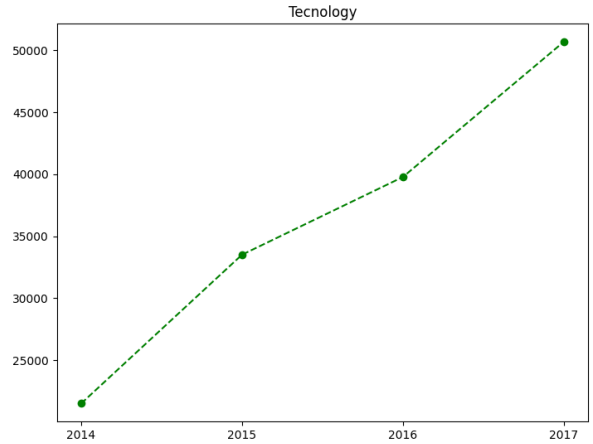


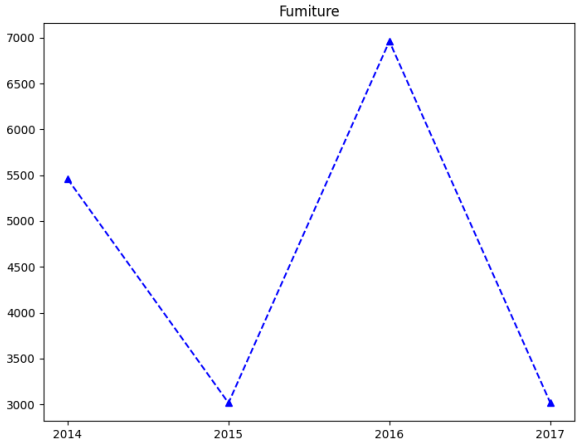
จงแสดงกราฟรายได้ของแต่ละ Category ในแต่ละปี แบบแยกกราฟ

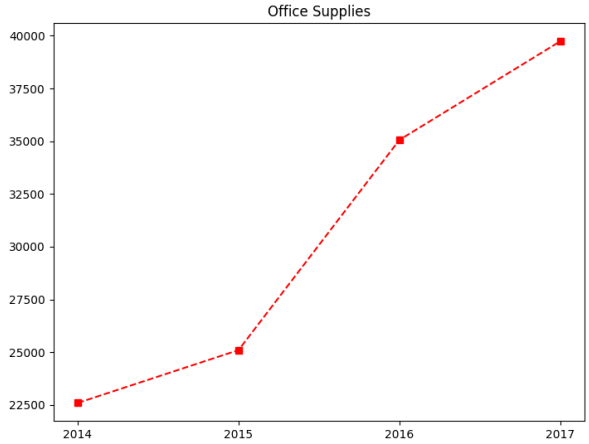
In [ ]:
```
fig = plt.figure()
axes1 = fig.add_axes([0.6,1.2,1,1])
axes1.plot(x, z, 'og--')
axes1.set_title('Tecnology')
axes1.set_xticks([2014, 2015, 2016, 2017])

axes2 = fig.add_axes([0,0,1,1])
axes2.plot(x, g, '^b--')
axes2.set_title('Fumiture')
axes2.set_xticks([2014, 2015, 2016, 2017])

axes3 = fig.add_axes([1.2,0,1,1])
axes3.plot(x, y, 'sr--')
```

```
axes3.set_title('Office Supplies')
axes3.set_xticks([2014, 2015, 2016, 2017])
```

Out[ ]:
```
[<matplotlib.axis.XTick at 0x1e993cb8d90>,
 <matplotlib.axis.XTick at 0x1e993caaed0>,
 <matplotlib.axis.XTick at 0x1e993ca9c50>,
 <matplotlib.axis.XTick at 0x1e993cd3c50>]
```







In [ ]: