Data Visualization with Matplotlib - Exercises
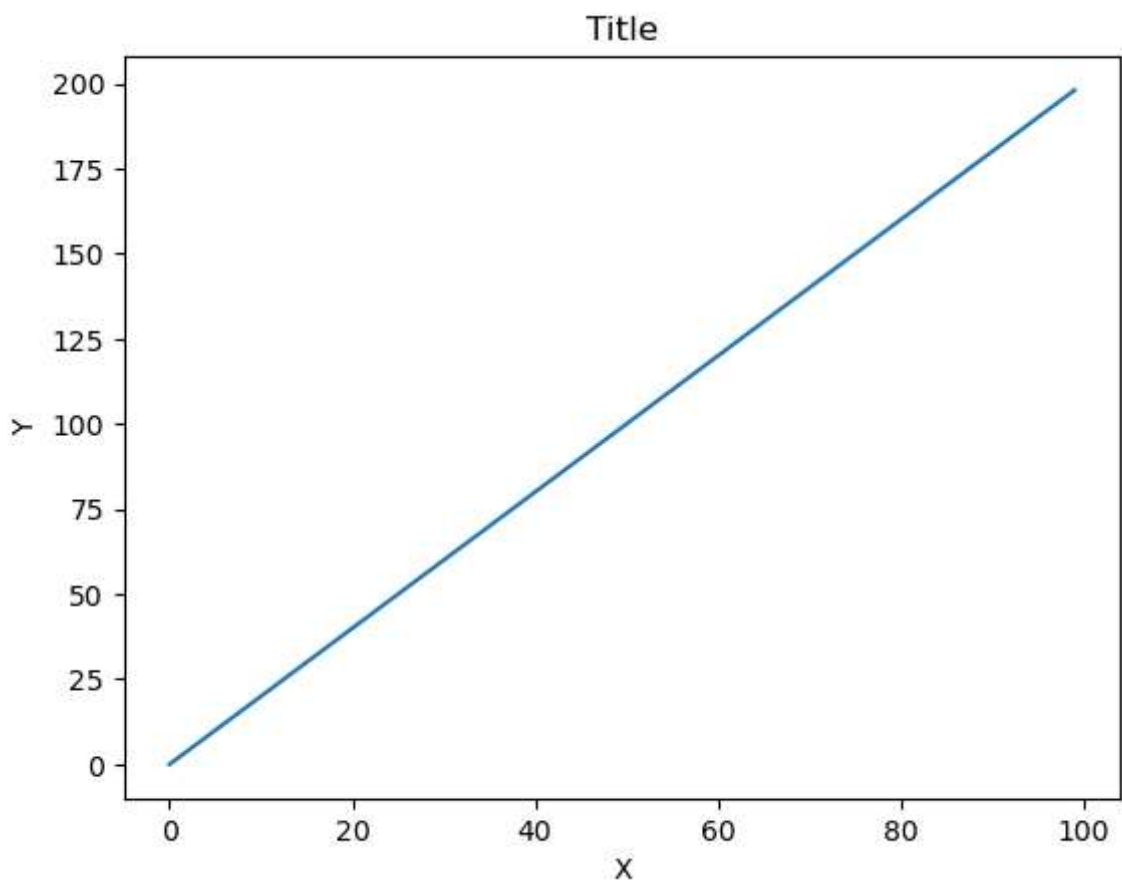
จงทำตามคำสั่งต่อไปนี้ด้วย data ที่กำหนดให้ต่อไปนี้

Data

```
In [54]:  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 [55]:  plt.plot(x, y)
          plt.xlabel('X')
          plt.ylabel('Y')
          plt.title('Title')
          plt.show()
```


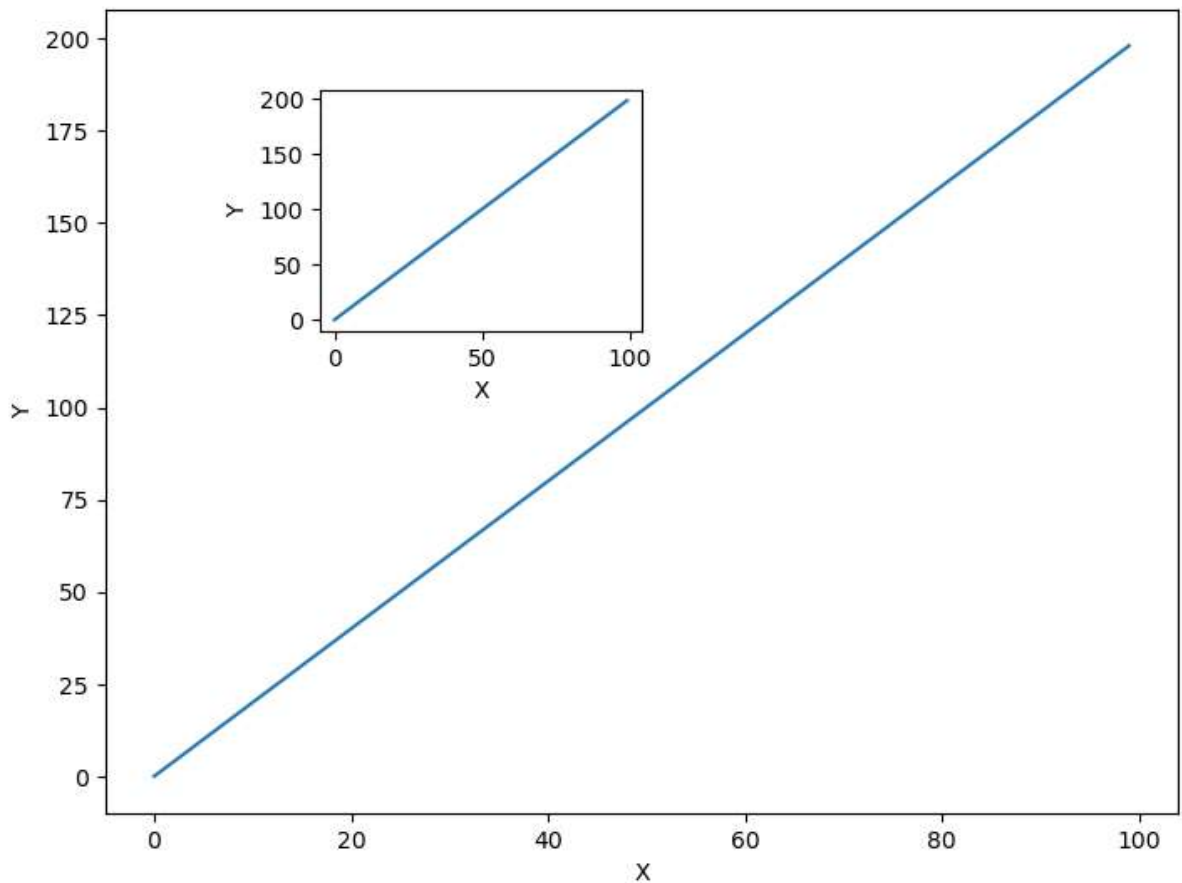## Exercise 2

```
In [59]:  fig = plt.figure()
          axes1 = fig.add_axes([0,0,1,1])
          axes1.plot(x,y)
          plt.xlabel('X')
          plt.ylabel('Y')

          axes2 = fig.add_axes([0.2,0.6,0.3,0.3])
          axes2.plot(x,y)
          plt.xlabel('X')
          plt.ylabel('Y')
```
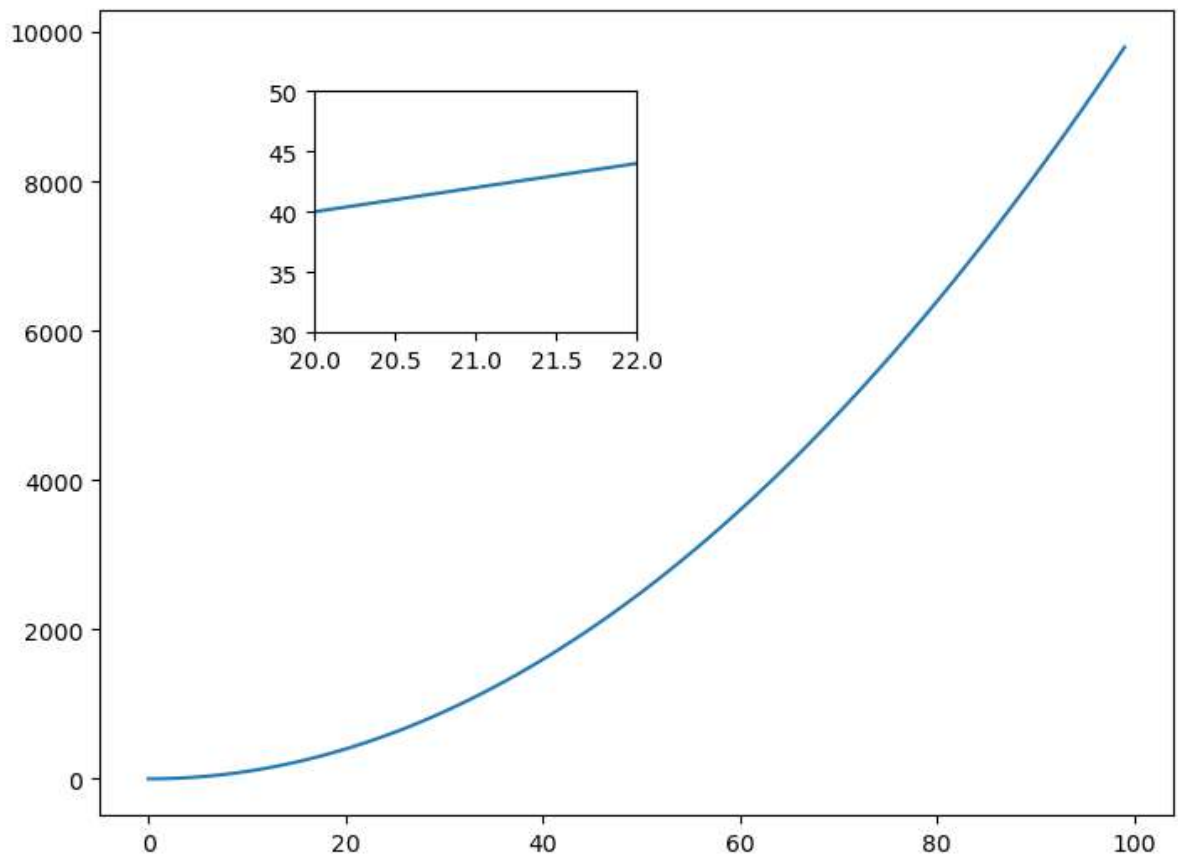
Out[59]: Text(0, 0.5, 'Y')

Exercise 3

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

```
In [61]:  fig = plt.figure()
          axes1 = fig.add_axes([0,0,1,1])
          axes1.plot(x,z)

          axes2 = fig.add_axes([0.2,0.6,0.3,0.3])
          axes2.plot(x,y,)
          axes2.set_ylim(30,50)
          axes2.set_xlim(20,22)
```
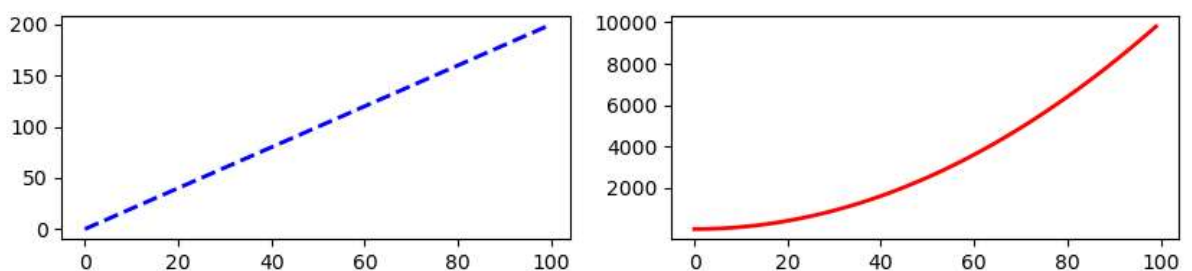
Out[61]: (20.0, 22.0)

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 [104...
```python
fig, axes = plt.subplots(nrows = 1, ncols = 2,figsize = (10,2))
axes[0].plot(x, y,color = 'b',ls='--',lw=2)
axes[1].plot(x, z,color = 'red',lw=2)
plt.yticks([2000,4000,6000,8000,10000])
plt.show()
```


Exercise 5

In [100...
```python
df.head()
```

Out[100]:

	Order ID	Customer Name	Segment	Day	Month	Year	Ship Mode	City	State	Category	C
0	CA-2016-152156	Claire Gute	Consumer	8	11	2016	Second Class	Henderson	Kentucky	Furniture	Bc
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 [101...

```python
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
```
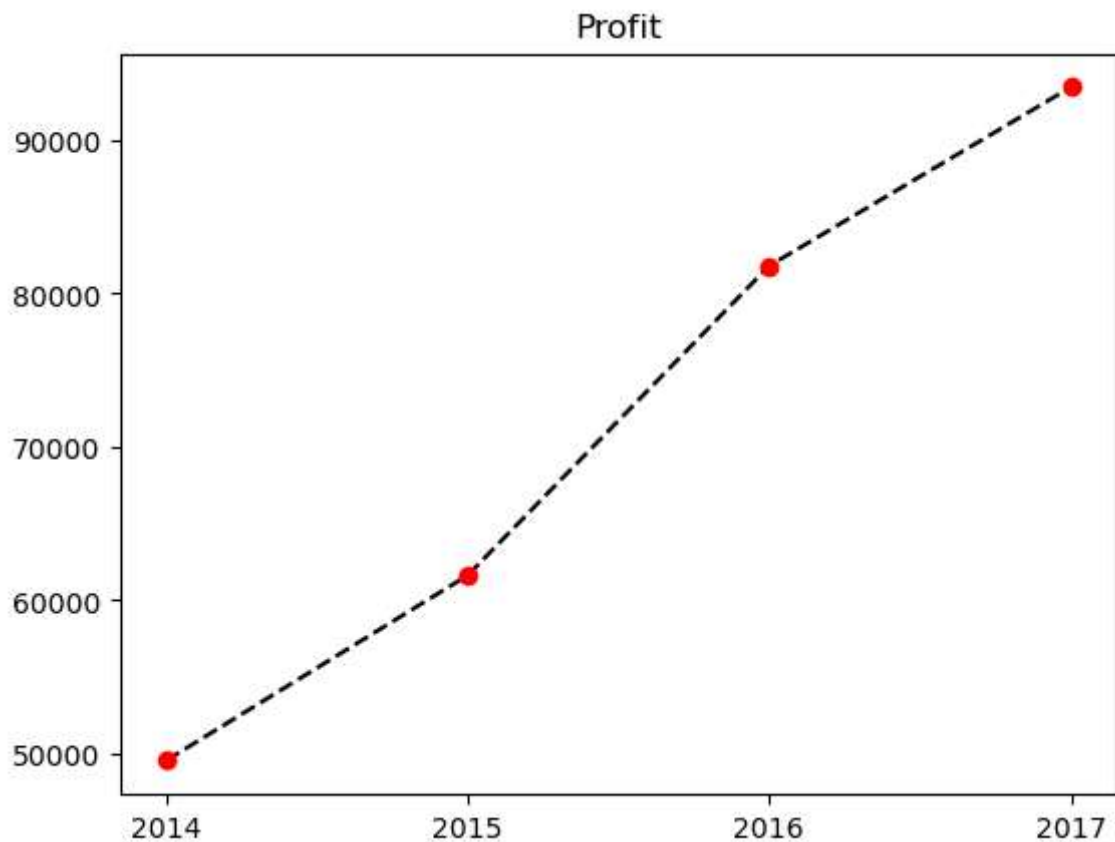
จงแสดงกราฟรายได้ของทุกปี

In [102...

```python
df1 = df.groupby('Year')['Profit'].sum()
a = df1.index
b = df1
```

In [128…
```python
plt.plot(a, b, marker='o',mec='r',mfc='r', color='k',ls='--')
plt.xticks([2014,2015,2016,2017])
plt.title('Profit')
```

Out[128]:
```
Text(0.5, 1.0, 'Profit')
```


โค้ดต่อไปนี้ใช้ในสองข้อสุดท้าย

In [138…
```python
df['Category'].unique()
```

Out[138]:
```
array(['Furniture', 'Office Supplies', 'Technology'], dtype=object)
```

In [139…
```python
df[ df['Category'] == 'Furniture' ].groupby('Year').sum()['Profit']
```

Out[139]:
```
Year
2014    5457.7255
2015    3015.2029
2016    6959.9531
2017    3018.3913
Name: Profit, dtype: float64
```

Dictionary of Category

In [140…
```python
arr_df = {}
for i in range(0,df['Category'].nunique()) :
    arr_df[df['Category'].unique()[i]] = df[ df['Category'] == df['Category'].uniqu
```

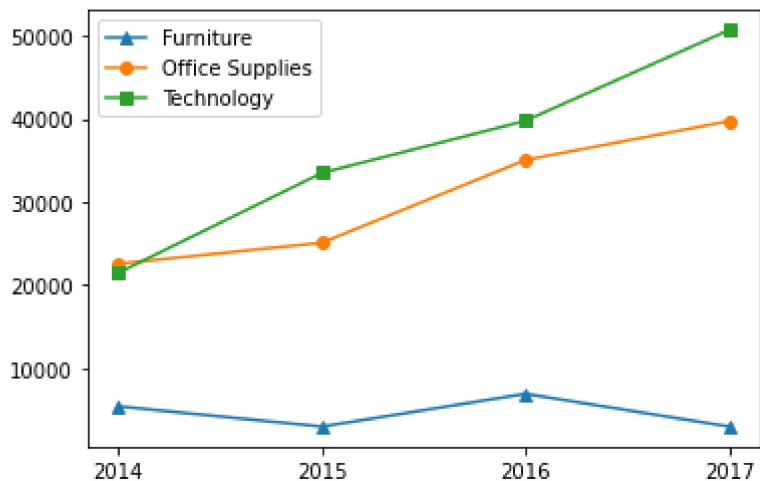In [141…
```python
x = arr_df['Furniture'].index
y = arr_df['Furniture']
z = arr_df['Office Supplies']
v = arr_df['Technology']
```

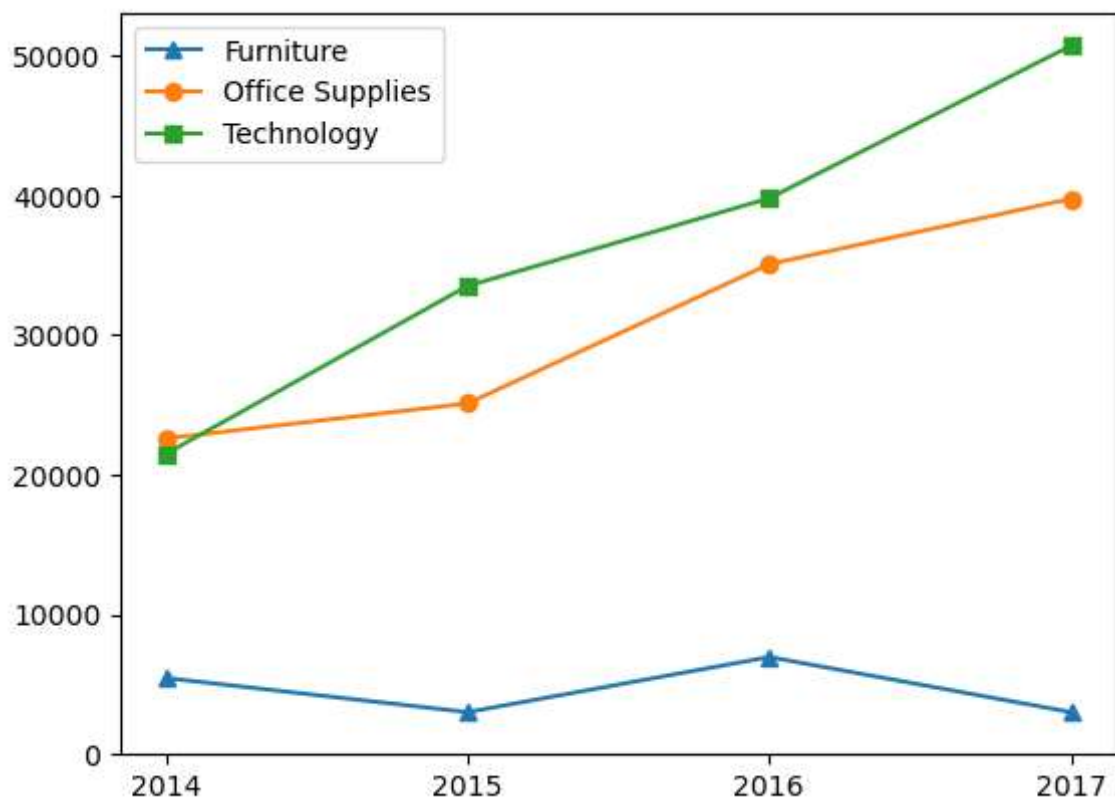# จงแสดงกราฟรายได้ของแต่ละ Category ในแต่ละปีใน กราฟเดียว

In [90]:

Out[90]: `<matplotlib.legend.Legend at 0x1ea23a16d30>`

In [150…]
```python
plt.plot(x, y, marker='^', label='Furniture')
plt.plot(x, z, marker='o', label='Office Supplies')
plt.plot(x, v, marker='s', label='Technology')
plt.yticks(np.arange(0,60000,10000))
plt.xticks([2014,2015,2016,2017])
plt.legend(loc = 'upper left')
plt.show()
```
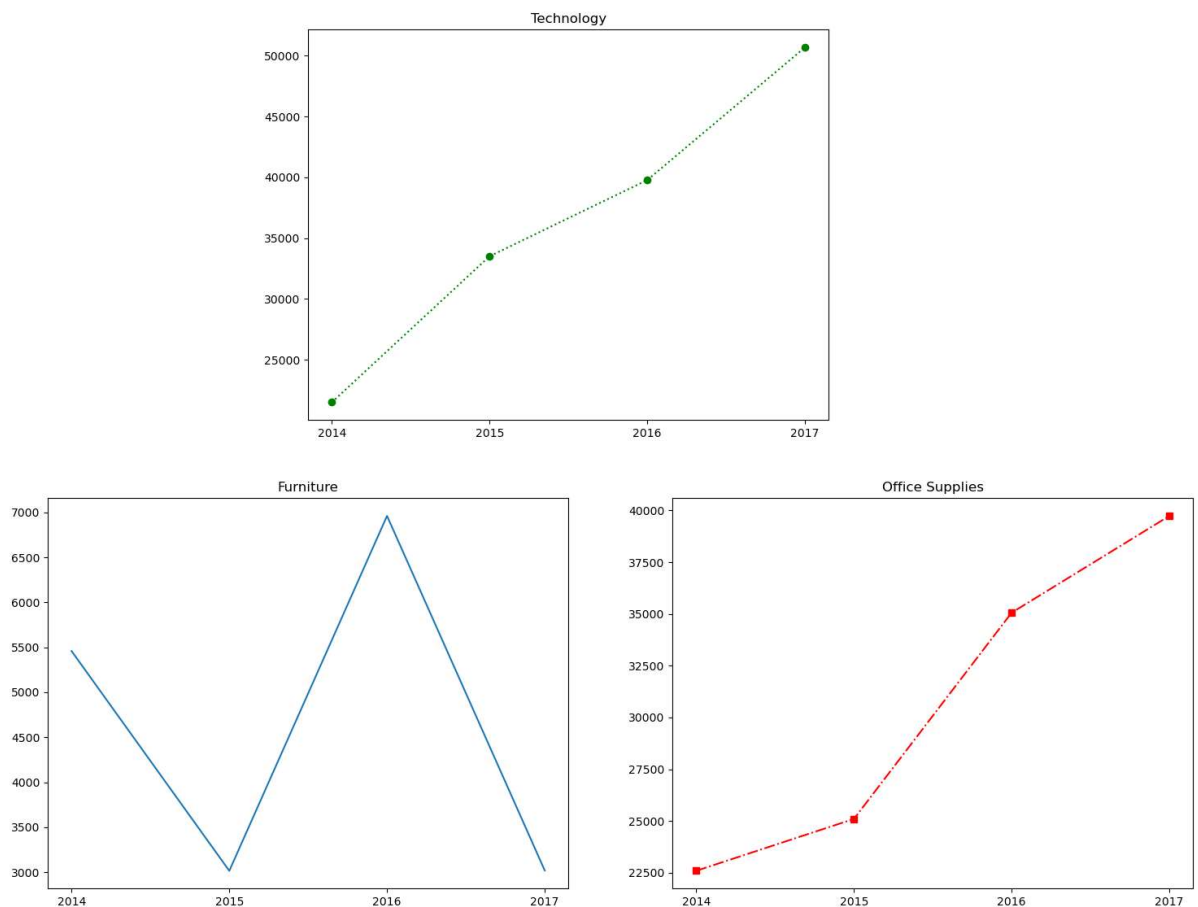
จงแสดงกราฟรายได้ของแต่ละ Category ในแต่ละปี แบบแยกกราฟ

In [149...

```python
fig = plt.figure()
axes1 = fig.add_axes([0,0,1,1])
axes1.plot(x,y)
axes1.set_title('Furniture')
axes1.set_yticks(np.arange(3000,7500,500))
axes1.set_xticks([2014,2015,2016,2017])

axes2 = fig.add_axes([1.2,0,1,1])
axes2.plot(x,z,'s-.r')
axes2.set_title('Office Supplies')
axes2.set_yticks(np.arange(22500,42000,2500))
axes2.set_xticks([2014,2015,2016,2017])

axes3 = fig.add_axes([0.5,1.2,1,1])
axes3.plot(x,v,'o:g')
axes3.set_title('Technology')
axes3.set_yticks(np.arange(25000,50001,5000))
axes3.set_xticks([2014,2015,2016,2017])
plt.show()
```


In [ ]: