Data Visualization with Matplotlib - Exercises

จงทำตามคำสั่งต่อไปนี้ด้วย data ที่กำหนดให้ต่อไปนี้

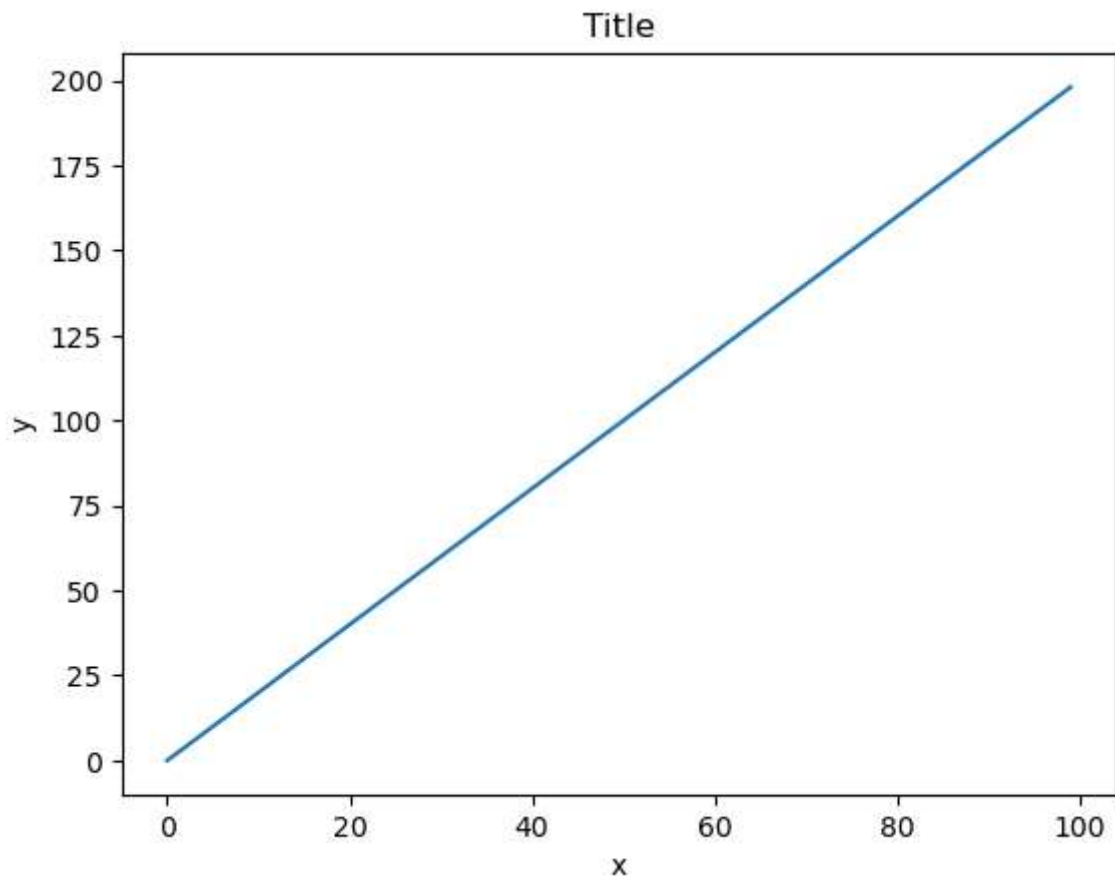## Data

```
In [44]:  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')
```
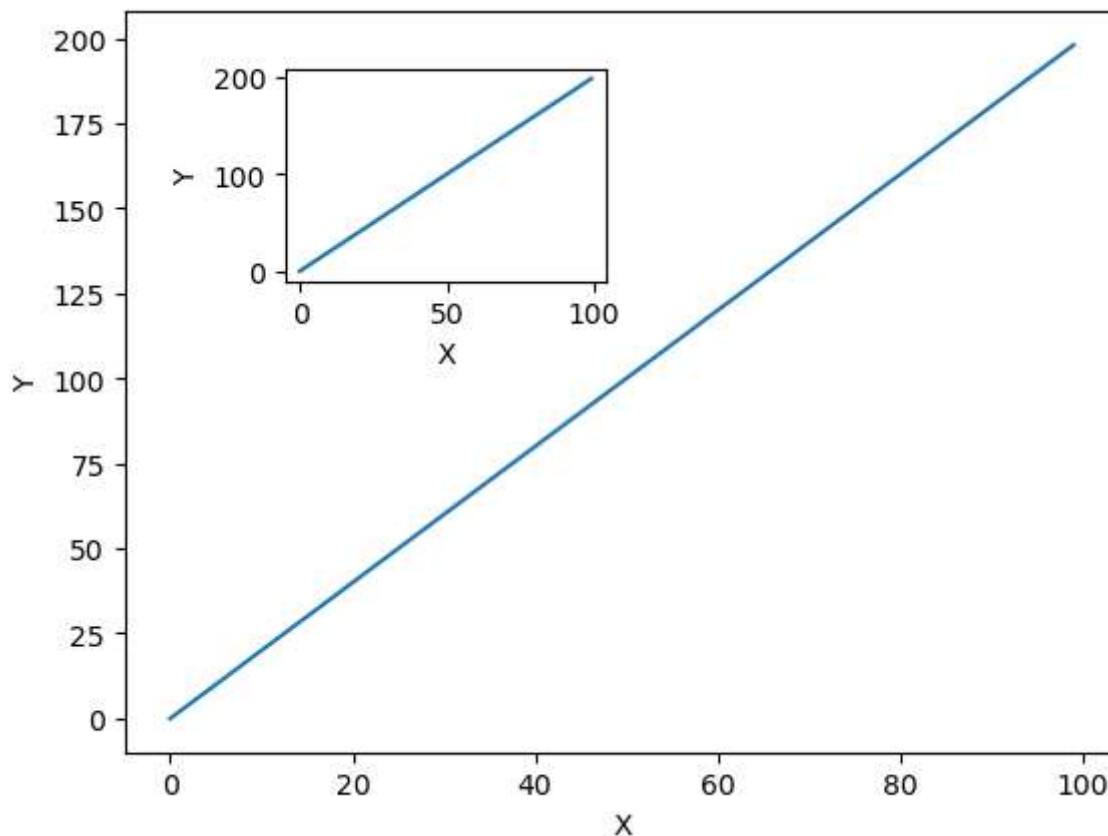
Exercise 1

```
In [45]:  plt.plot(x,y)
          plt.title("Title")
          plt.xlabel('x')
          plt.ylabel('y')
```

```
Out[45]:  Text(0, 0.5, 'y')
```

Exercise 2

```
In [46]:  fig = plt.figure()
          plt.plot(x,y)
          plt.xlabel('X')
          plt.ylabel('Y')
          axes1 = plt.axes([.25,.6,.25,.22])
          axes1 = plt.ylabel('Y')
          axes1 = plt.xlabel('X')
          axes1 = plt.plot(x,y)
```


Exercise 3

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

In [56]:
```python
fig = plt.figure()
axes1 = fig.add_axes([0,0,1,1])
axes1.plot(x,z)
axes1= plt.xlabel('X')
axes1 = plt.ylabel('Z')
axes2 = fig.add_axes([.2,.6,.3,.3])
axes2.plot(x,y,y,color = '#7AAED2' )
axes2.set_ylim(30,55)
axes2.set_xlim(20,22)
axes2= plt.xlabel('X')
axes2 = plt.ylabel('Y')
```
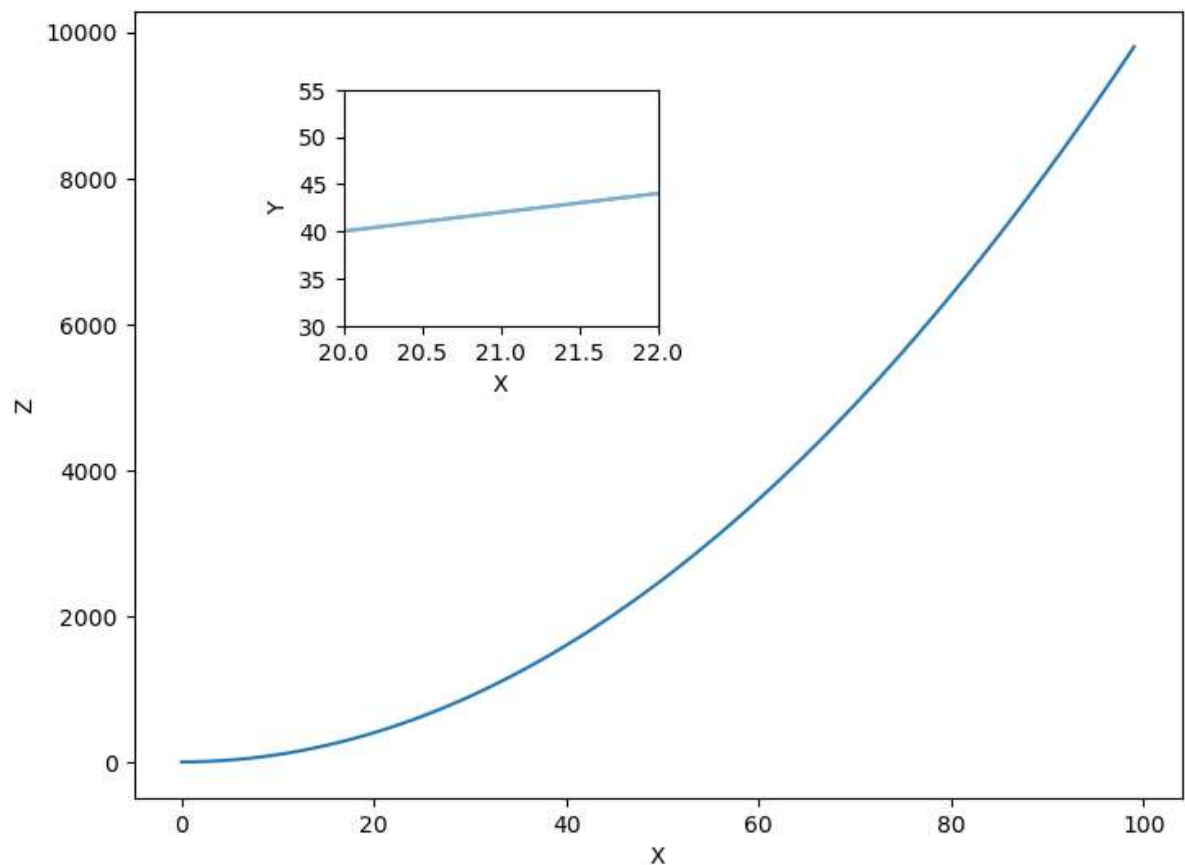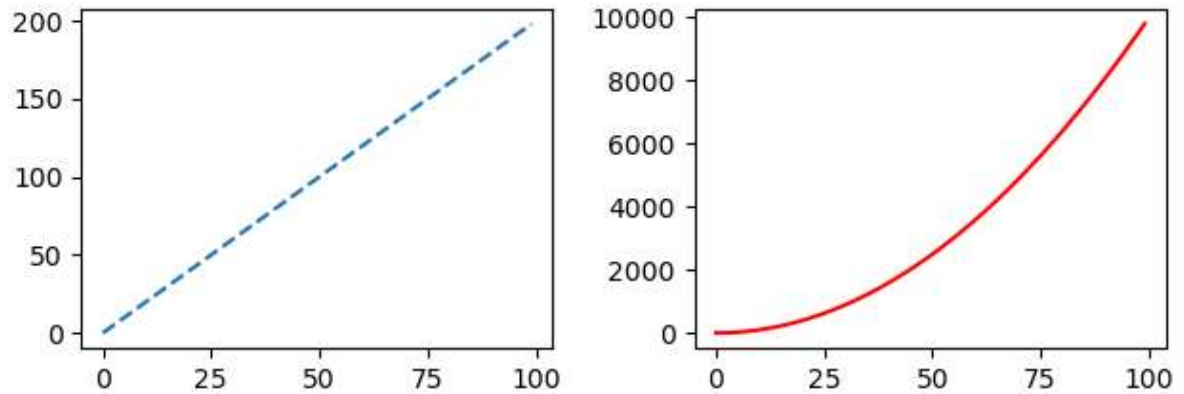

Exercise 4

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

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

In [66]:
```python
fig, axes = plt.subplots(nrows=1 , ncols=2)
axes[0].plot(x,y,'--')
axes[1].plot(x,z,'r')
fig.tight_layout();
fig.set_figheight(2)
fig.set
```

Out[66]: `<bound method Figure.set of <Figure size 640x200 with 2 Axes>>`

Exercise 5

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

Out[6]:

	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	Bo
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 [ ]: `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 [68]:
```python
df1 = df.groupby('Year')['Profit'].sum()
a = df1.index
b = df1
```

In [79]:
```python
plt.plot(a,b,'o--',mfc= 'red',color = 'black',)
```

Out[79]: [<matplotlib.lines.Line2D at 0x1f737dd3810>]
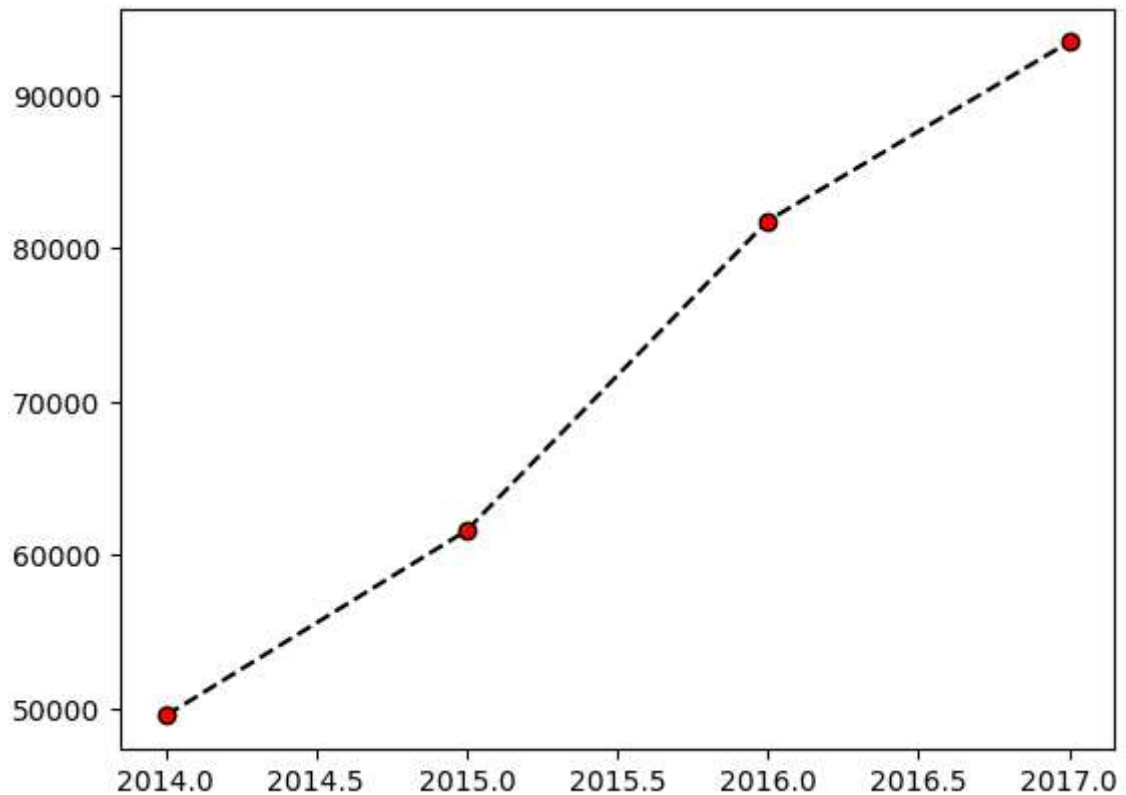
โค้ดต่อไปนี้ใช้ในสองข้อสุดท้าย

In [80]:
```python
df['Category'].unique()
```

Out[80]: array(['Furniture', 'Office Supplies', 'Technology'], dtype=object)

In [81]:
```python
df[ df['Category'] == 'Furniture' ].groupby('Year').sum()['Profit']
```

Out[81]:
```
Year
2014    5457.7255
2015    3015.2029
2016    6959.9531
2017    3018.3913
Name: Profit, dtype: float64
```
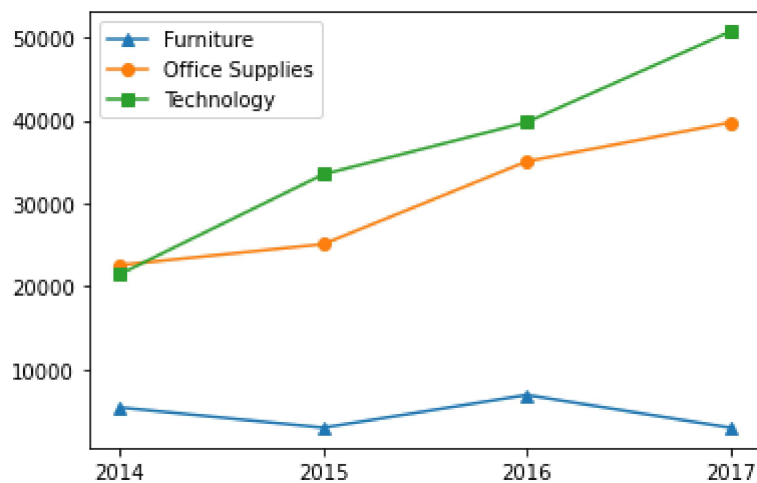
Dictionary of Category

In [82]:
```python
arr_df = {}
for i in range(0,df['Category'].nunique()) :
    arr_df[df['Category'].unique()[i]] = df[ df['Category'] == df['Category'].u
```

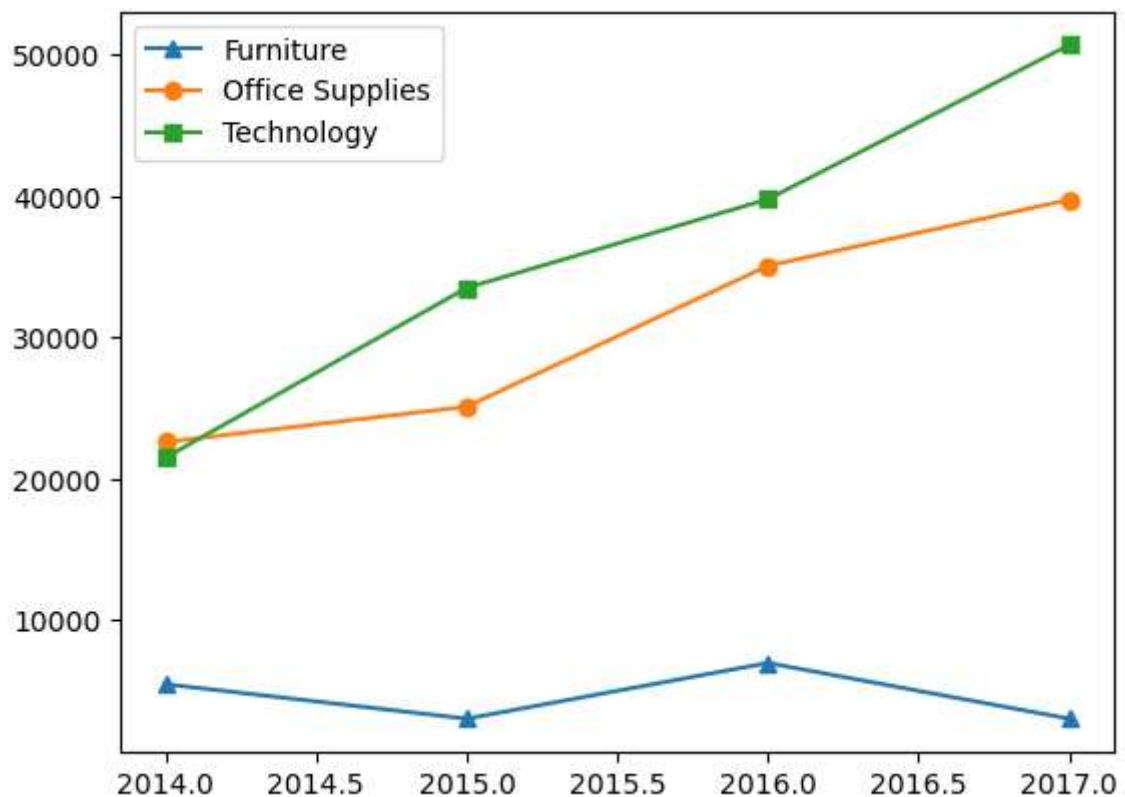# จงแสดงกราฟรายได้ของแต่ละ Category ในแต่ละปีในกราฟ

In [ ]:
```
plt.plot(arr_df["Furniture"].index,arr_df["Furniture"])
```

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

In [104]:
```
plt.plot(arr_df["Furniture"].index,arr_df["Furniture"],'^-',label = "Furniture"
plt.plot(arr_df["Office Supplies"].index,arr_df["Office Supplies"],'o-',label =
plt.plot(arr_df['Technology'].index,arr_df["Technology"],'s-',label = "Technold

plt.legend(loc = "best")
```
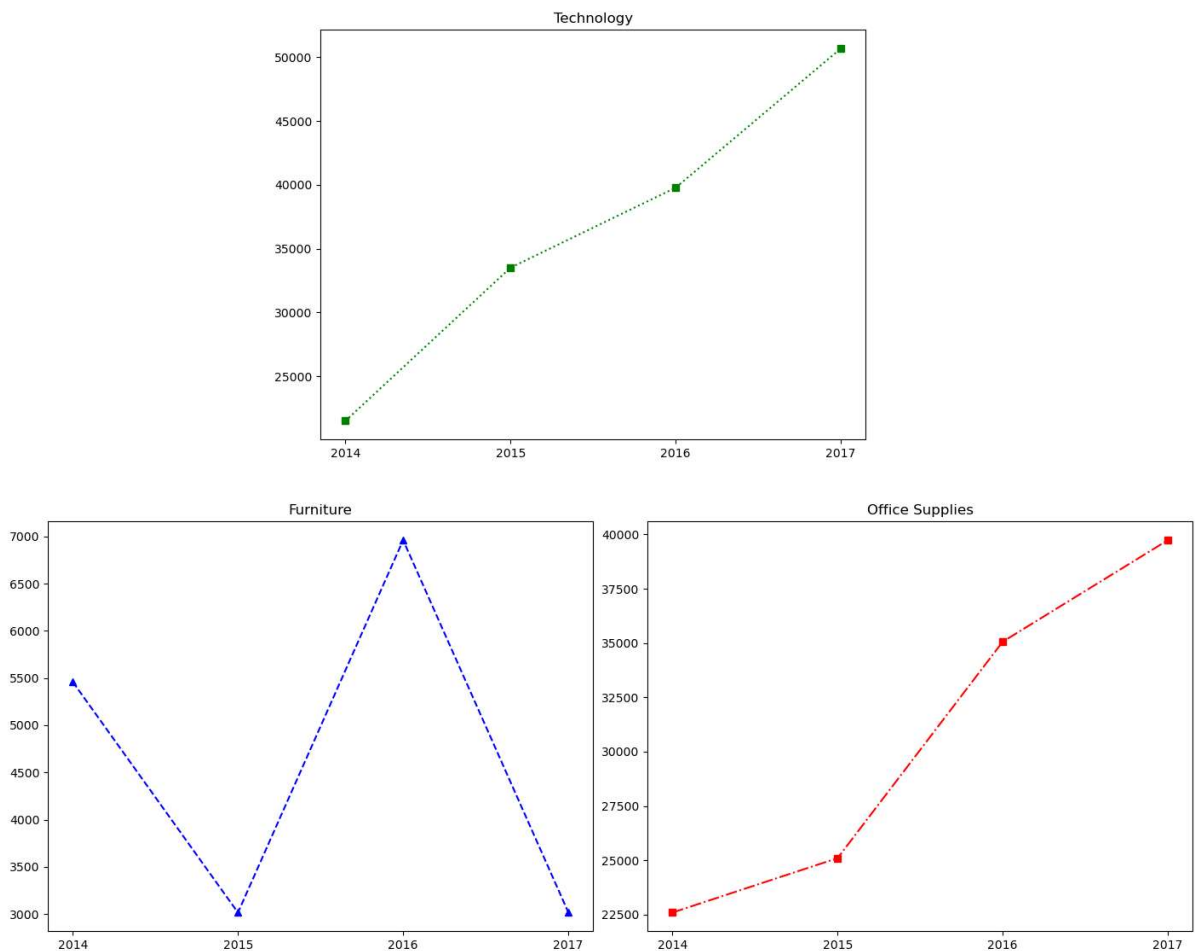
Out[104]: `<matplotlib.legend.Legend at 0x1f73b65e790>`

จงแสดงกราฟรายได้ของแต่ละ Category ในแต่ละปี แบบแยกกราฟ

In [105]:
```python
fig = plt.figure()
axes1 = fig.add_axes([0.5,1.2,1,1])
axes1.plot(arr_df["Technology"].index,arr_df["Technology"],"s:g",label="Technol
axes1.set_title("Technology")
axes1.set_xticks(np.arange(2014,2018,1))
axes2 = fig.add_axes([0,0,1,1])
axes2.plot(arr_df["Furniture"].index,arr_df["Furniture"],"^--b",label="Furnitur
axes2.set_title("Furniture")
axes2.set_xticks(np.arange(2014,2018,1))
axes3 = fig.add_axes([1.1,0,1,1])
axes3.plot(arr_df["Office Supplies"].index,arr_df["Office Supplies"],"s-.r",lab
axes3.set_title("Office Supplies")
axes3.set_xticks(np.arange(2014,2018,1))
```

Out[105]:
```
[<matplotlib.axis.XTick at 0x1f73b7442d0>,
 <matplotlib.axis.XTick at 0x1f73b74aa90>,
 <matplotlib.axis.XTick at 0x1f73b73e9d0>,
 <matplotlib.axis.XTick at 0x1f73b7814d0>]
```


In [ ]: