



AD HOC ANALYSIS

A stylized icon representing a C:/ drive. It consists of a light blue square border containing a dark blue square. Inside the dark blue square, the text 'C:/' is written in a light green, bold, sans-serif font.

C:/

TABLES AND VISUALS

INTERCESSION

TABLE 1: COUNT OF EACH ITEM SOLD PER MONTH

[]:

	First Item	Second Item	Third Item	month
0	Exotic Extras,Beef Chicharon,(x4)	None	None	1
1	Exotic Extras,Beef Chicharon,(x3)	HealthyKid 3+,Nutrional Milk,(x4)	Candy City,Orange Beans,(x1)	1
2	HealthyKid 3+,Gummy Vitamins,(x3)	HealthyKid 3+,Yummy Vegetables,(x2)	None	1
3	HealthyKid 3+,Yummy Vegetables,(x1)	None	None	1
4	Candy City,Orange Beans,(x3)	Candy City,Gummy Worms,(x4)	HealthyKid 3+,Gummy Vitamins,(x1)	1
...
83031	Exotic Extras,Kimchi and Seaweed,(x2)	HealthyKid 3+,Nutrional Milk,(x1)	None	6
83032	HealthyKid 3+,Yummy Vegetables,(x1)	Exotic Extras,Kimchi and Seaweed,(x1)	Candy City,Orange Beans,(x4)	6
83033	Candy City,Orange Beans,(x4)	Candy City,Gummy Worms,(x4)	HealthyKid 3+,Yummy Vegetables,(x4)	6
83034	HealthyKid 3+,Nutrional Milk,(x2)	Candy City,Gummy Worms,(x2)	None	6
83035	HealthyKid 3+,Nutrional Milk,(x1)	Candy City,Gummy Worms,(x3)	Candy City,Orange Beans,(x1)	6

83036 rows x 5 columns

[21]:

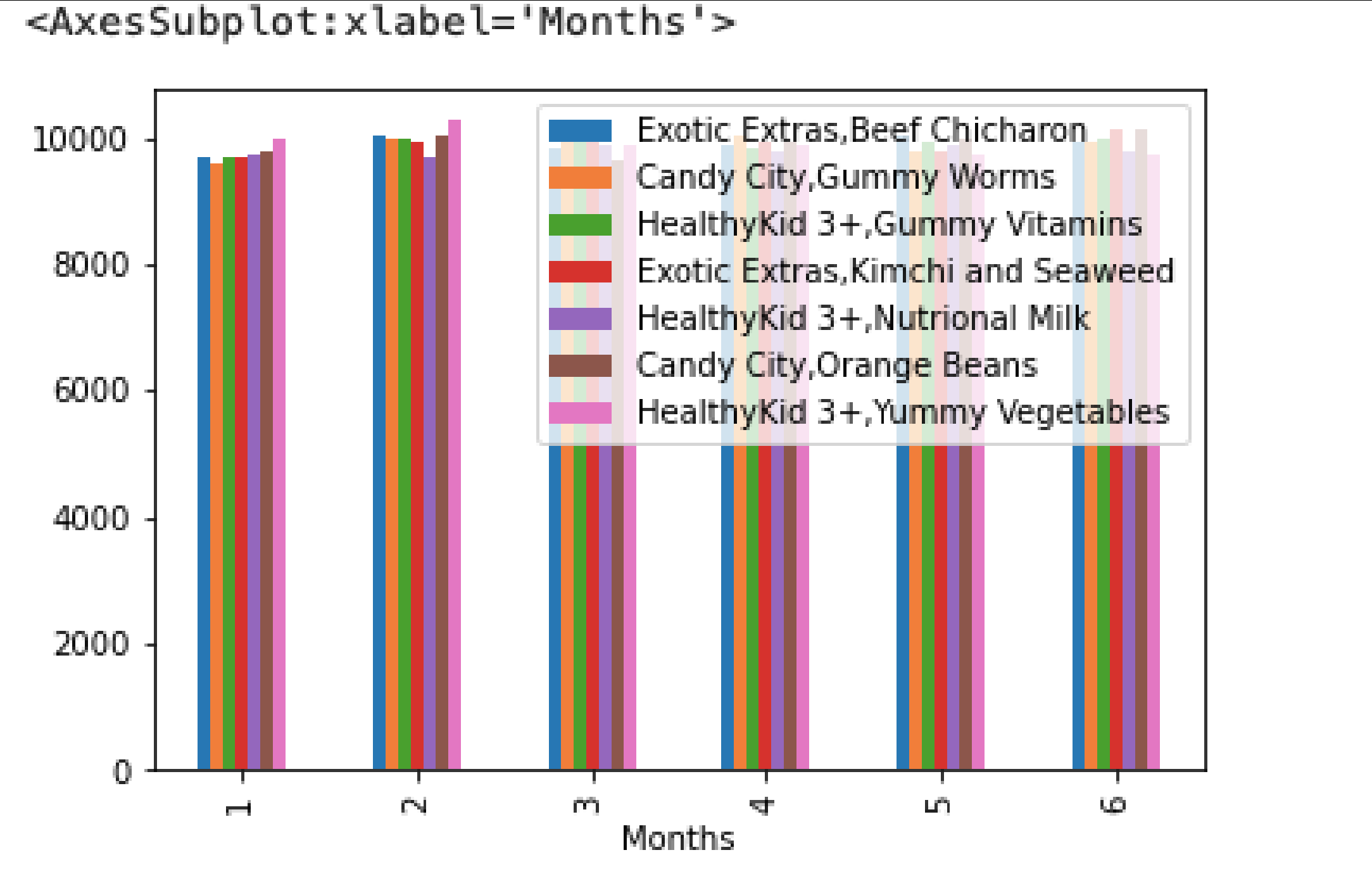
	month	First Transaction	Q1	Second Transaction	Q2	Third Transaction	Q3
0	1	Exotic Extras Beef Chicharon	4	None	0	None	0
1	1	Exotic Extras Beef Chicharon	3	HealthyKid 3+ Nutrional Milk	4	Candy City Orange Beans	1
2	1	HealthyKid 3+ Gummy Vitamins	3	HealthyKid 3+ Yummy Vegetables	2	None	0
3	1	HealthyKid 3+ Yummy Vegetables	1	None	0	None	0
4	1	Candy City Orange Beans	3	Candy City Gummy Worms	4	HealthyKid 3+ Gummy Vitamins	1
...
83031	6	Exotic Extras Kimchi and Seaweed	2	HealthyKid 3+ Nutrional Milk	1	None	0
83032	6	HealthyKid 3+ Yummy Vegetables	1	Exotic Extras Kimchi and Seaweed	1	Candy City Orange Beans	4
83033	6	Candy City Orange Beans	4	Candy City Gummy Worms	4	HealthyKid 3+ Yummy Vegetables	4
83034	6	HealthyKid 3+ Nutrional Milk	2	Candy City Gummy Worms	2	None	0
83035	6	HealthyKid 3+ Nutrional Milk	1	Candy City Gummy Worms	3	Candy City Orange Beans	1

83036 rows x 7 columns

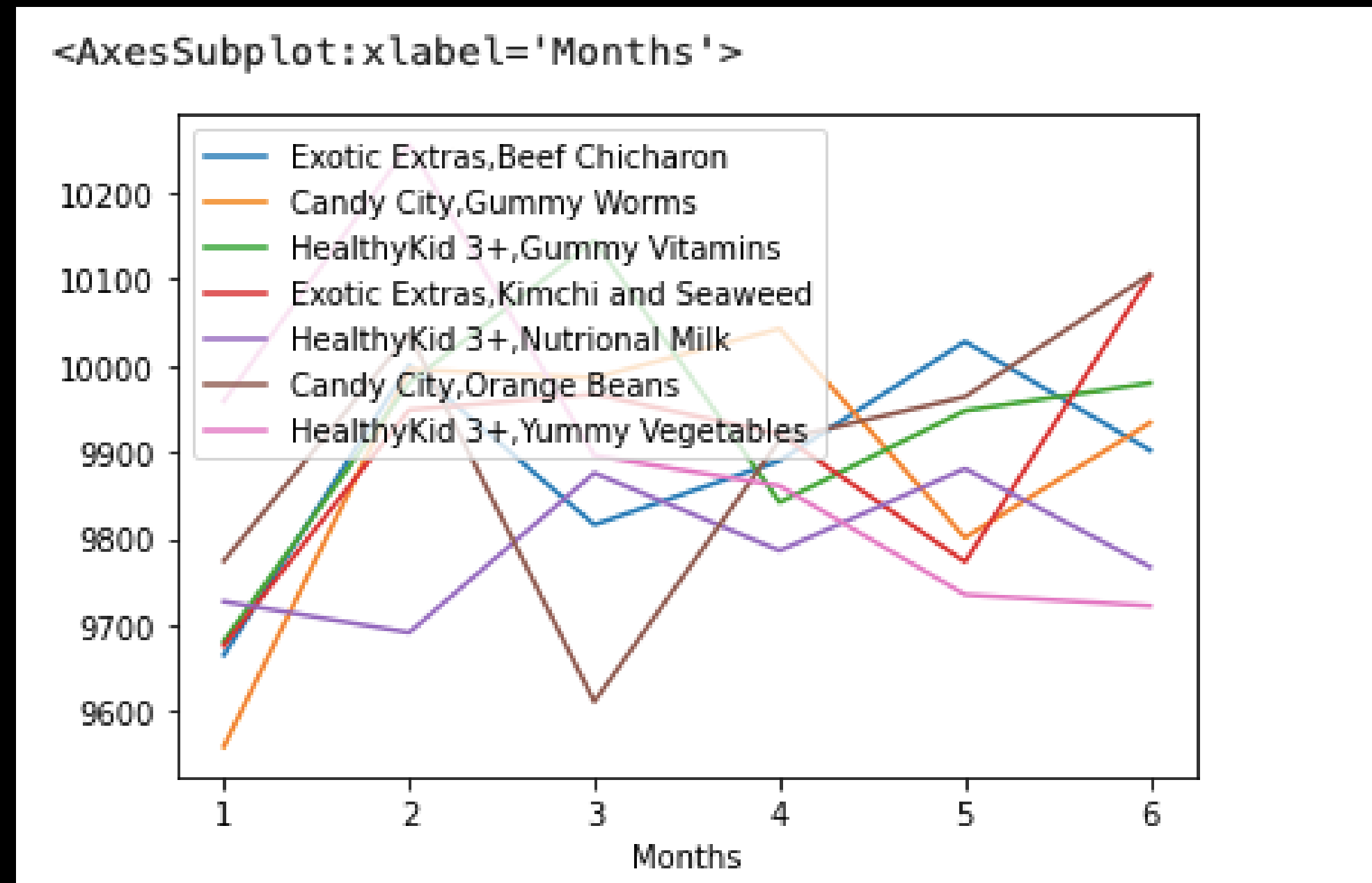
[29]:

	month	1	2	3	4	5	6	sum
Candy City Gummy Worms		9559.0	9996.0	9986.0	10043.0	9801.0	9934.0	
Candy City Orange Beans		9774.0	10037.0	9611.0	9914.0	9964.0	10106.0	
Exotic Extras Beef Chicharon		9665.0	10001.0	9816.0	9890.0	10028.0	9902.0	
Exotic Extras Kimchi and Seaweed		9676.0	9949.0	9967.0	9921.0	9773.0	10104.0	
HealthyKid 3+ Gummy Vitamins		9681.0	9980.0	10145.0	9842.0	9948.0	9980.0	
HealthyKid 3+ Nutrional Milk		9727.0	9691.0	9876.0	9786.0	9881.0	9767.0	
HealthyKid 3+ Yummy Vegetables		9959.0	10256.0	9896.0	9861.0	9735.0	9722.0	

BAR GRAPH: COUNT OF EACH ITEM SOLD PER MONTH

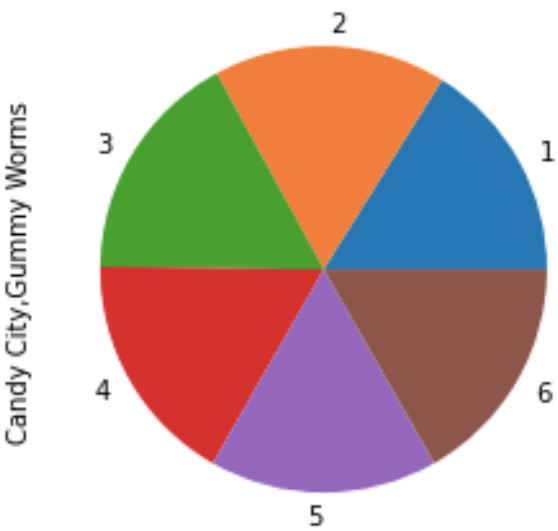


LINE GRAPH: COUNT OF EACH ITEM SOLD PER MONTH

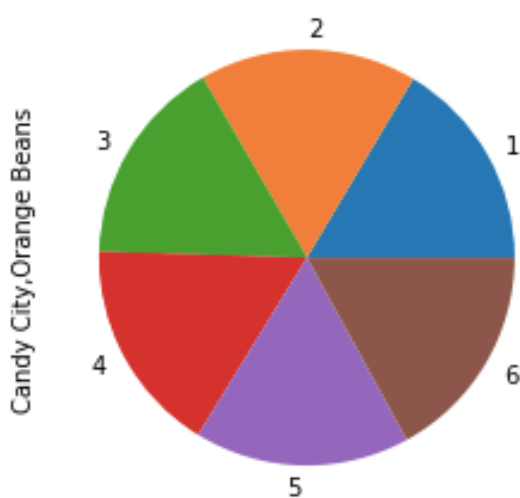


PIE CHARTS: COUNT OF EACH ITEM SOLD PER MONTH

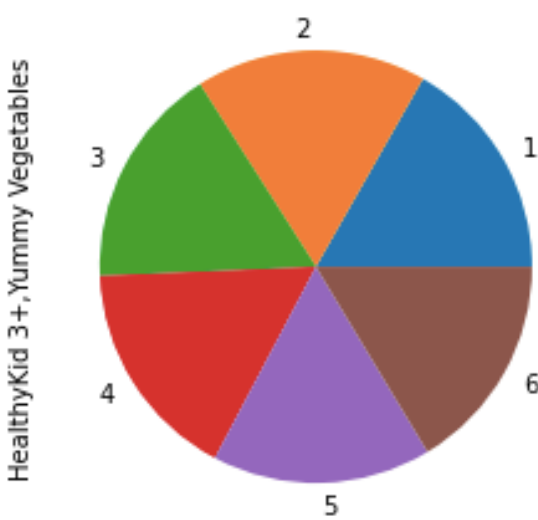
[69]: <AxesSubplot:ylabel='Candy City, Gummi Worms'



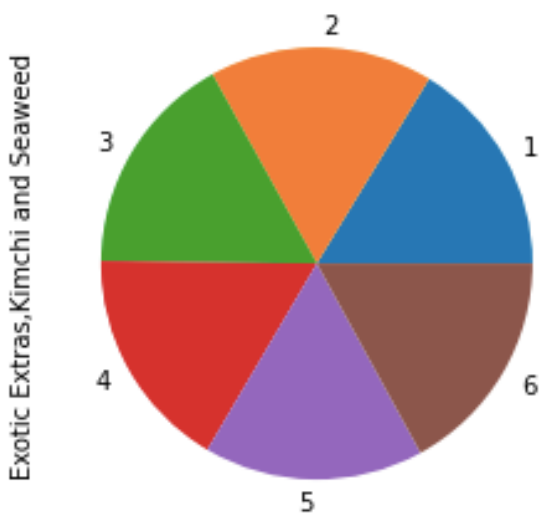
[73]: <AxesSubplot:ylabel='Candy City, Orange Beans'



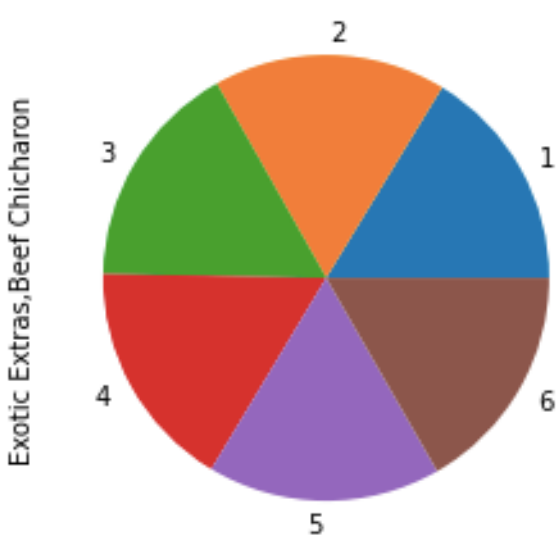
[74]: <AxesSubplot:ylabel='HealthyKid 3+, Yummy Vegetables'



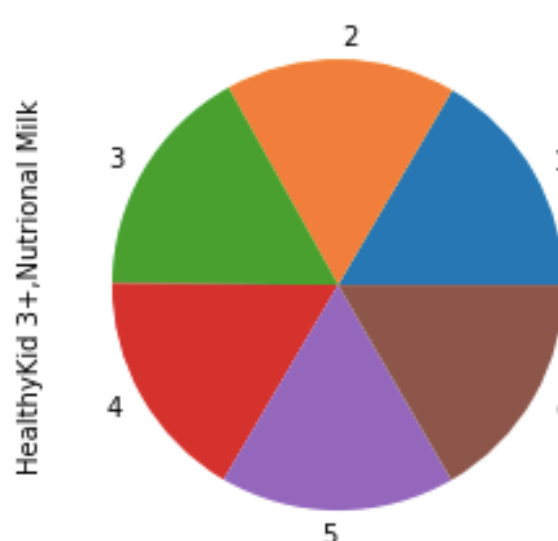
[71]: <AxesSubplot:ylabel='Exotic Extras, Kimchi and Seaweed'



[68]: <AxesSubplot:ylabel='Exotic Extras, Beef Chicharon'



[72]: <AxesSubplot:ylabel='HealthyKid 3+, Nutritional Milk'



[70]: <AxesSubplot:ylabel='HealthyKid 3+, Gummy Vitamins'

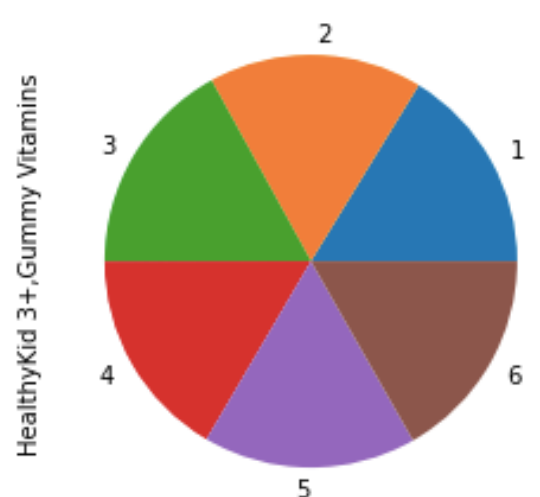


TABLE 2: TOTAL SALE VALUE PER ITEM PER MONTH

```
[36]: #Make Arrays for Computation
      #Treat them as system of equations
      #A: Beef Chicharon
      #B: Nutritional Milk
      #C: Orange Beans
      #D: Gummy Vitamins
      #E: Yummy Vegetables
      #F: Gummy Worms
      #G: Kimchi and Seaweed
```

```
x=np.array([[4,0,0,0,0,0,0],
            [3,4,1,0,0,0,0],
            [0,0,0,3,2,0,0],
            [0,0,0,0,1,0,0],
            [0,0,3,1,0,4,0],
            [0,1,0,0,2,0,0],
            [0,0,0,0,0,0,4]])
```

```
[37]: print(x)
```

```
[[4 0 0 0 0 0 0]
 [3 4 1 0 0 0 0]
 [0 0 0 3 2 0 0]
 [0 0 0 0 1 0 0]
 [0 0 3 1 0 4 0]
 [0 1 0 0 2 0 0]
 [0 0 0 0 0 0 4]]
```

```
[40]: y=np.array([5196,12056,5500,500,2697,2990,3196])
```

```
[41]: print(y)
```

```
[ 5196 12056  5500    500  2697  2990  3196]
```

```
[41]: print(y)
```

```
[ 5196 12056  5500    500  2697  2990  3196]
```

```
[42]: z=np.linalg.solve(x,y)
```

```
[43]: print(z)
```

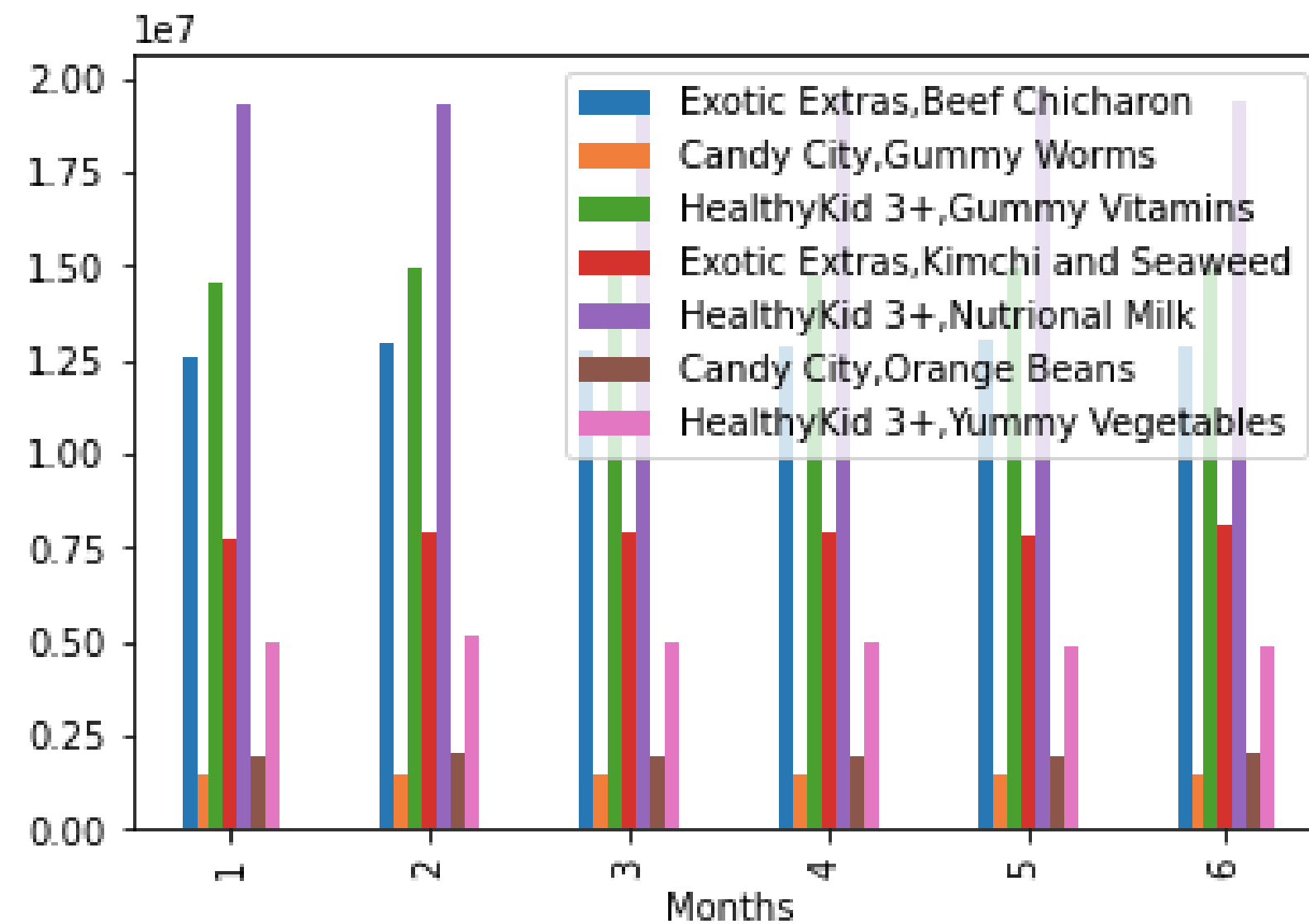
```
[1299. 1990.  199. 1500.  500.  150.  799.]
```

```
[44]:
```

	month	1	2	3	4	5	sum
Candy City Gummy Worms		1433850.0	1499400.0	1497900.0	1506450.0	1470150.0	1490100.0
Candy City Orange Beans		1945026.0	1997363.0	1912589.0	1972886.0	1982836.0	2011094.0
Exotic Extras Beef Chicharon		12554835.0	12991299.0	12750984.0	12847110.0	13026372.0	12862698.0
Exotic Extras Kimchi and Seaweed		7731124.0	7949251.0	7963633.0	7926879.0	7808627.0	8073096.0
HealthyKid 3+ Gummy Vitamins		14521500.0	14970000.0	15217500.0	14763000.0	14922000.0	14970000.0
HealthyKid 3+ Nutritional Milk		19356730.0	19285090.0	19653240.0	19474140.0	19663190.0	19436330.0
HealthyKid 3+ Yummy Vegetables		4979500.0	5128000.0	4948000.0	4930500.0	4867500.0	4861000.0

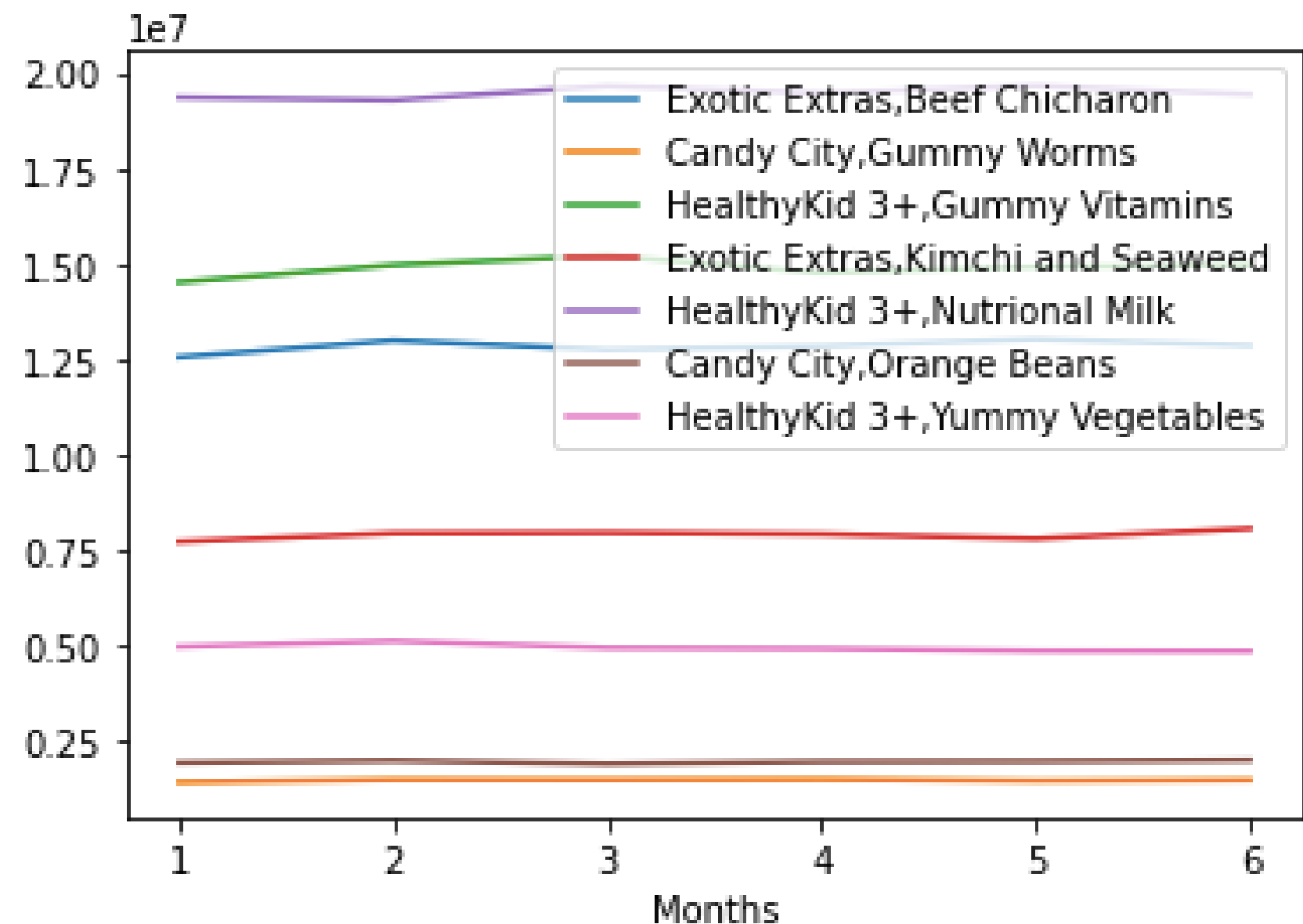
BAR GRAPH: TOTAL SALE VALUE PER ITEM PER MONTH

[44]: <AxesSubplot:xlabel='Months'>



LINE GRAPH: TOTAL SALE VALUE PER ITEM PER MONTH

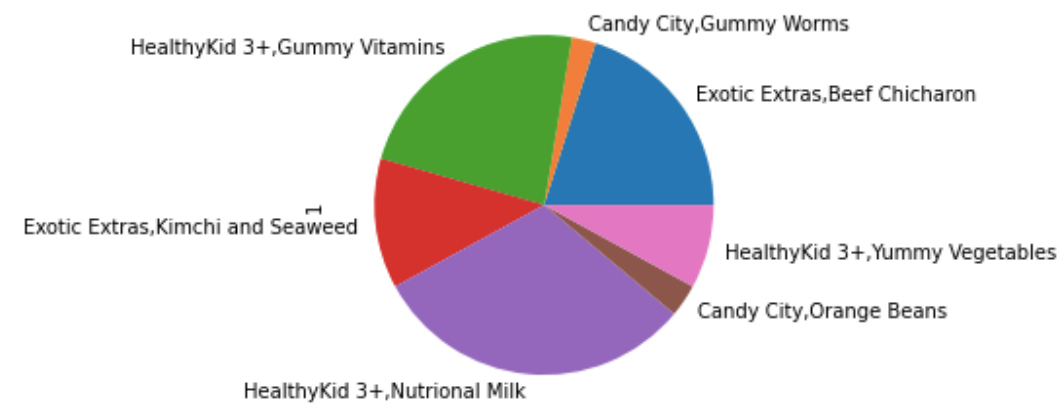
[45]: <AxesSubplot:xlabel='Months'>



PIE CHARTS: TOTAL SALE VALUE PER ITEM PER MONTH

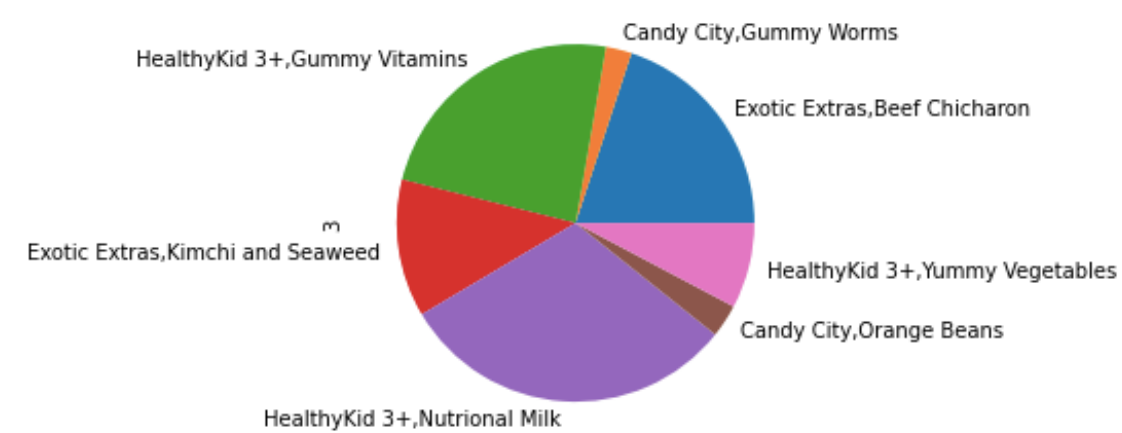
```
[57]: #Month 1
Final_Graph_df.iloc[0,:].plot(kind='pie')
```

```
[57]: <AxesSubplot:ylabel='1'>
```



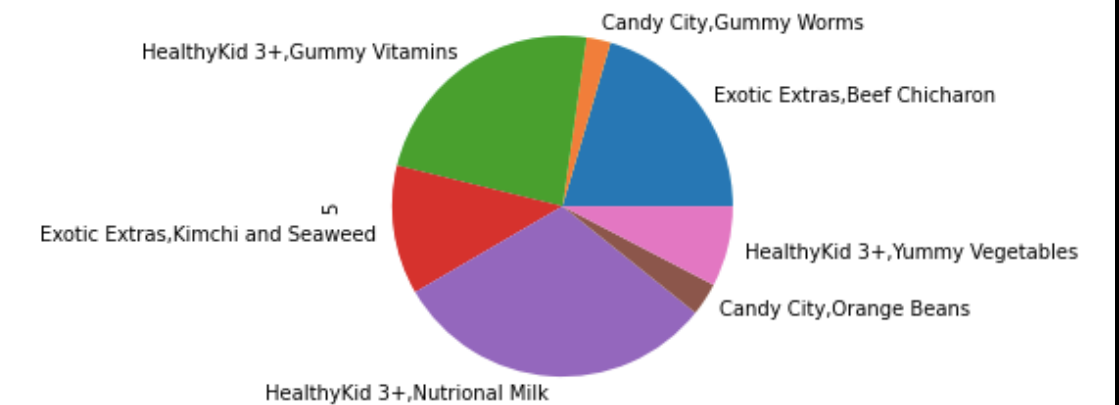
```
[48]: #Month 3
Final_Graph_df.iloc[2,:].plot(kind='pie')
```

```
[48]: <AxesSubplot:ylabel='3'>
```



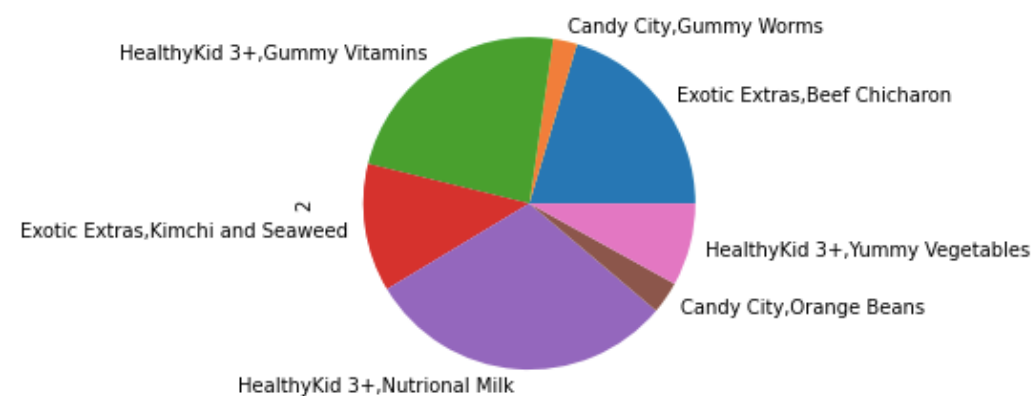
```
[50]: #Month 5
Final_Graph_df.iloc[4,:].plot(kind='pie')
```

```
[50]: <AxesSubplot:ylabel='5'>
```



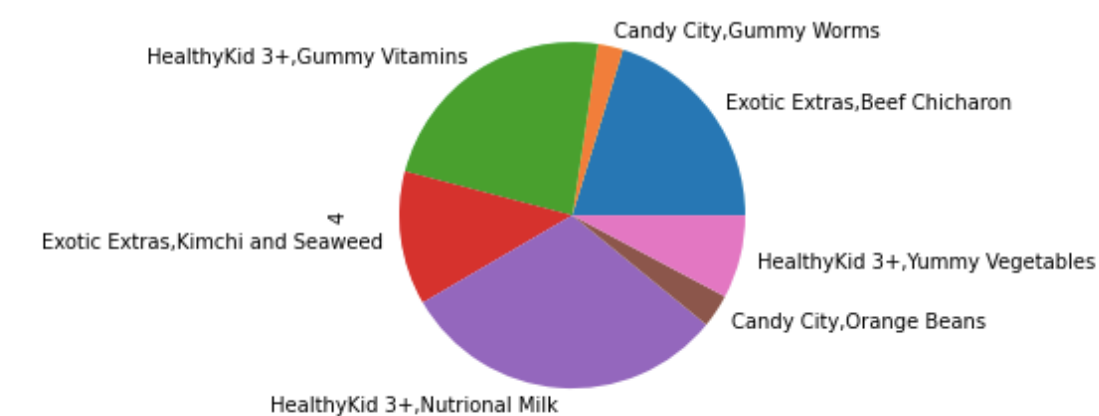
```
[47]: #Month 2
Final_Graph_df.iloc[1,:].plot(kind='pie')
```

```
[47]: <AxesSubplot:ylabel='2'>
```



```
[49]: #Month 4
Final_Graph_df.iloc[3,:].plot(kind='pie')
```

```
[49]: <AxesSubplot:ylabel='4'>
```



```
[51]: #Month 6
Final_Graph_df.iloc[5,:].plot(kind='pie')
```

```
[51]: <AxesSubplot:ylabel='6'>
```

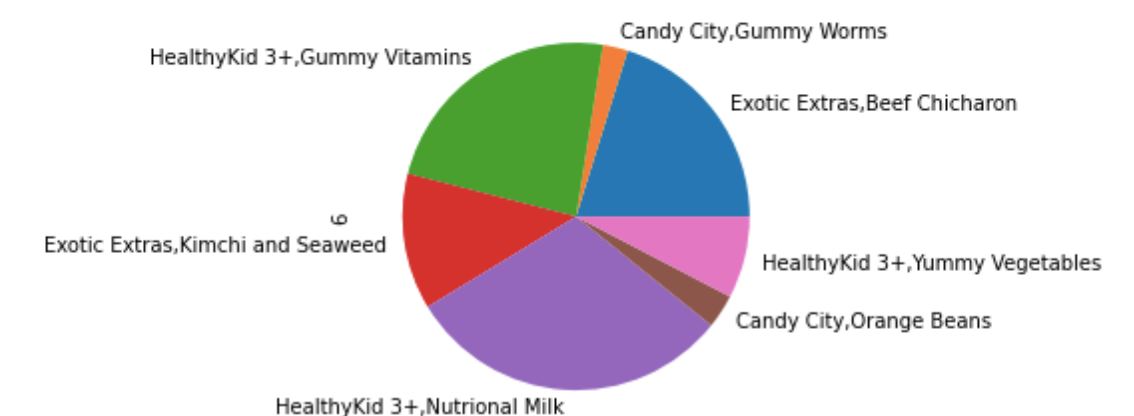


TABLE 3: REPEATER, INACTIVE, & ENGAGED

28]:

	name	transaction_date	month	First Month	Second Month	Third Month	Fourth Month	Fifth Month	Sixth Month
0	Jennifer Campbell	2022/01/12	1	True	False	False	False	False	False
1	Melissa Kim	2022/01/12	1	True	False	False	False	False	False
2	Melissa Kim	2022/01/08	1	True	False	False	False	False	False
3	Melissa Kim	2022/01/10	1	True	False	False	False	False	False
4	Kristen Cooper	2022/01/24	1	True	False	False	False	False	False
...
83031	Tammy Byrd	2022/06/05	6	False	False	False	False	False	True
83032	Donald Andersen	2022/06/12	6	False	False	False	False	False	True
83033	Donald Andersen	2022/06/15	6	False	False	False	False	False	True
83034	Donald Andersen	2022/06/09	6	False	False	False	False	False	True
83035	Stephanie Russell	2022/06/03	6	False	False	False	False	False	True

2]:

	name	month 1	month 2	month 3	month 4	month 5	month 6
month							
0	Aaron Beasley	0.0	0.0	0.0	2.0	2.0	1.0
1	Aaron Brewer	1.0	1.0	1.0	2.0	0.0	2.0
2	Aaron Brown	0.0	0.0	3.0	2.0	1.0	1.0
3	Aaron Coffey	1.0	2.0	2.0	2.0	2.0	0.0
4	Aaron Davis	1.0	1.0	0.0	3.0	3.0	2.0
...
8482	Zachary Valentine	1.0	1.0	1.0	1.0	2.0	3.0
8483	Zachary Ware	1.0	2.0	3.0	1.0	3.0	2.0
8484	Zachary Williams	4.0	4.0	4.0	4.0	0.0	0.0
8485	Zachary Wilson	0.0	0.0	0.0	1.0	2.0	2.0
8486	Zachary York	2.0	2.0	1.0	3.0	3.0	1.0

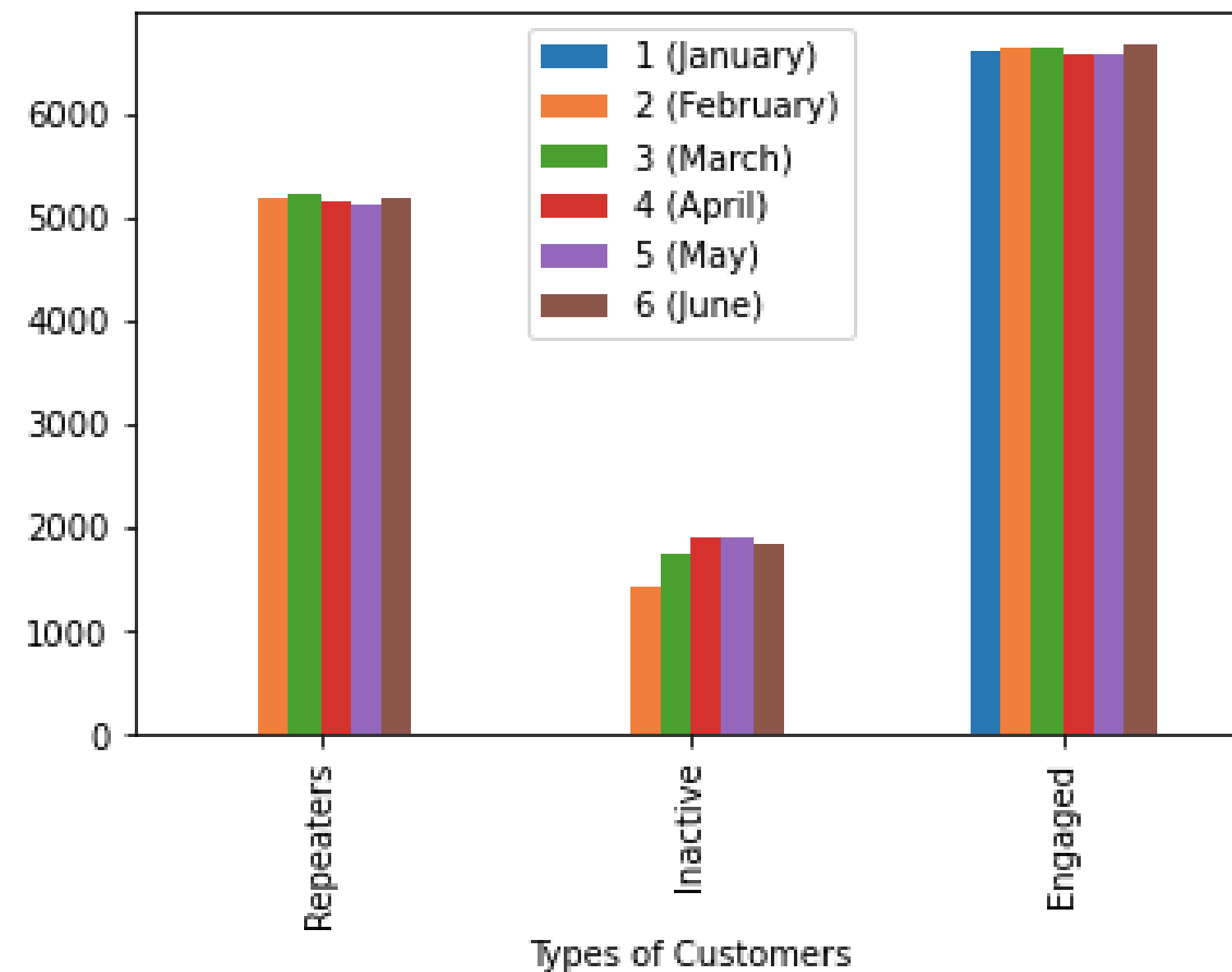
8487 rows x 7 columns

1]:

	1 (January)	2 (February)	3 (March)	4 (April)	5 (May)	6 (June)
Types of Customers						
Repeaters	0	5172	5216	5154	5110	5193
Inactive	0	1416	1747	1909	1917	1835
Engaged	6588	6631	6622	6556	6568	6652

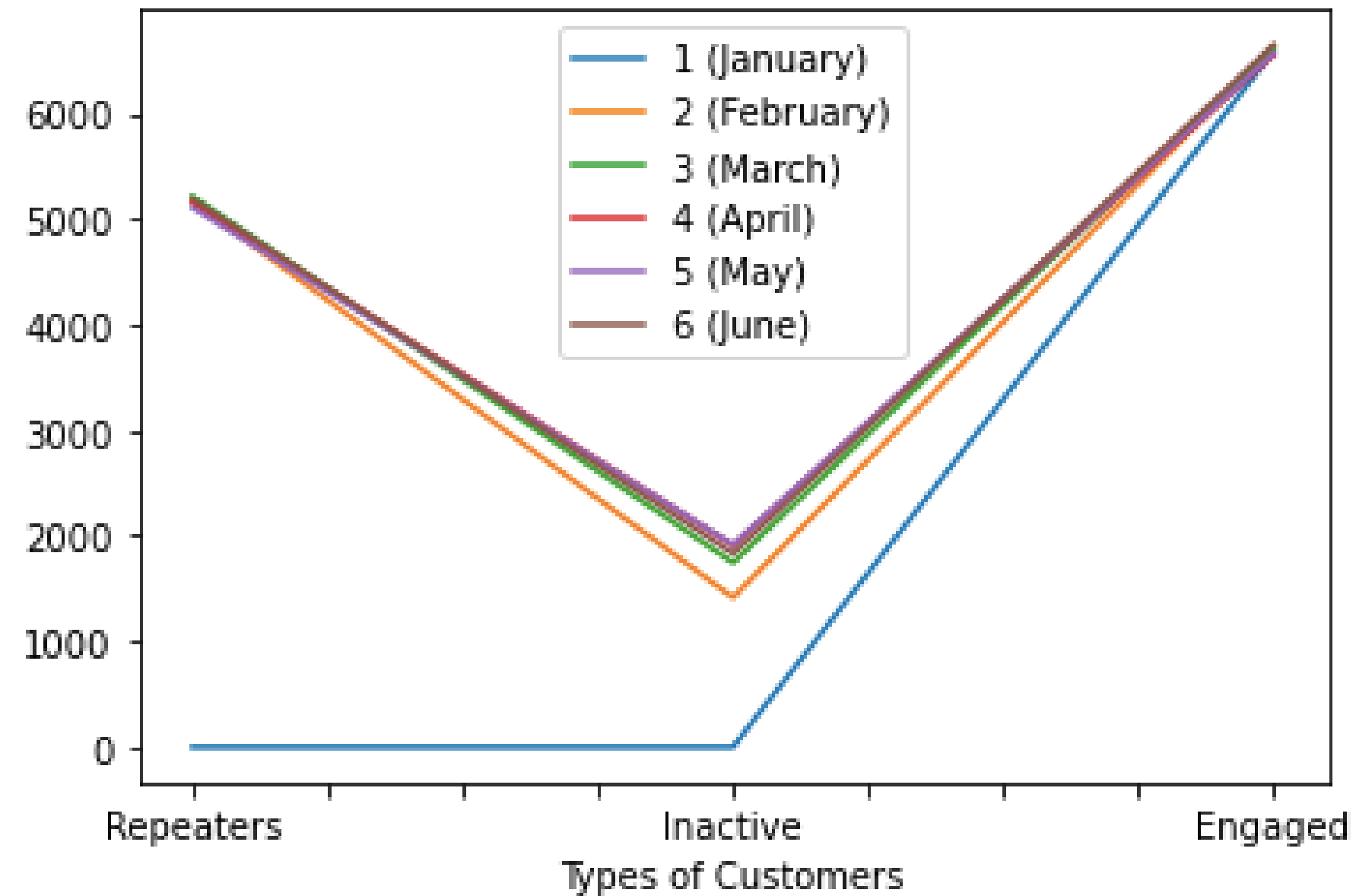
BAR GRAPH: REPEATER, INACTIVE, & ENGAGED

[64]: <AxesSubplot:xlabel='Types of Customers'>



LINE GRAPH: REPEATER, INACTIVE, & ENGAGED

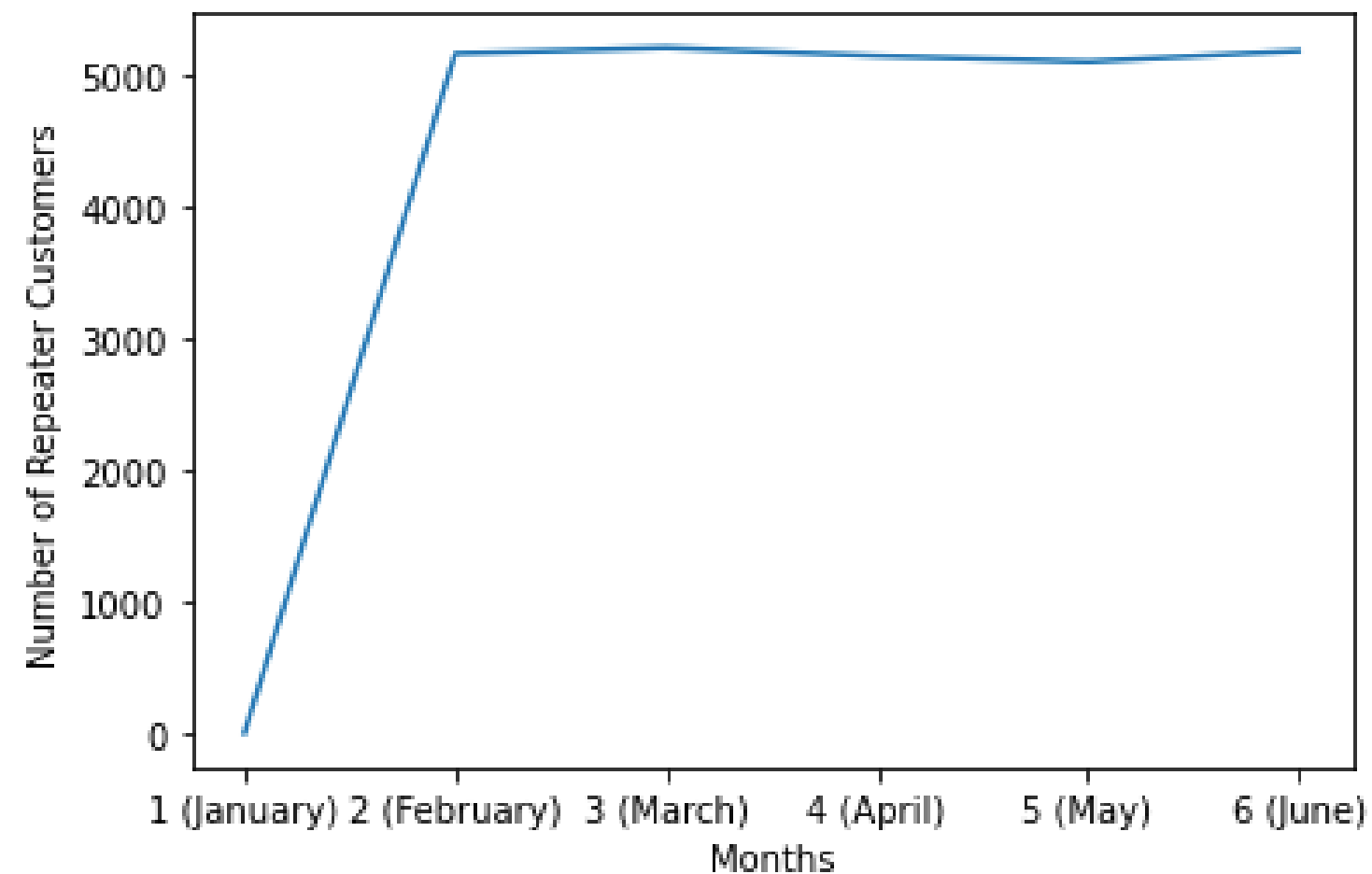
[65]: <AxesSubplot:xlabel='Types of Customers'>



LINE GRAPH: REPEATERS PER MONTH

```
[89]: #Repeaters  
CustomerTypte_df.iloc[0,:].plot(kind='line',xlabel='Months',ylabel='Number of Repeater Customers')
```

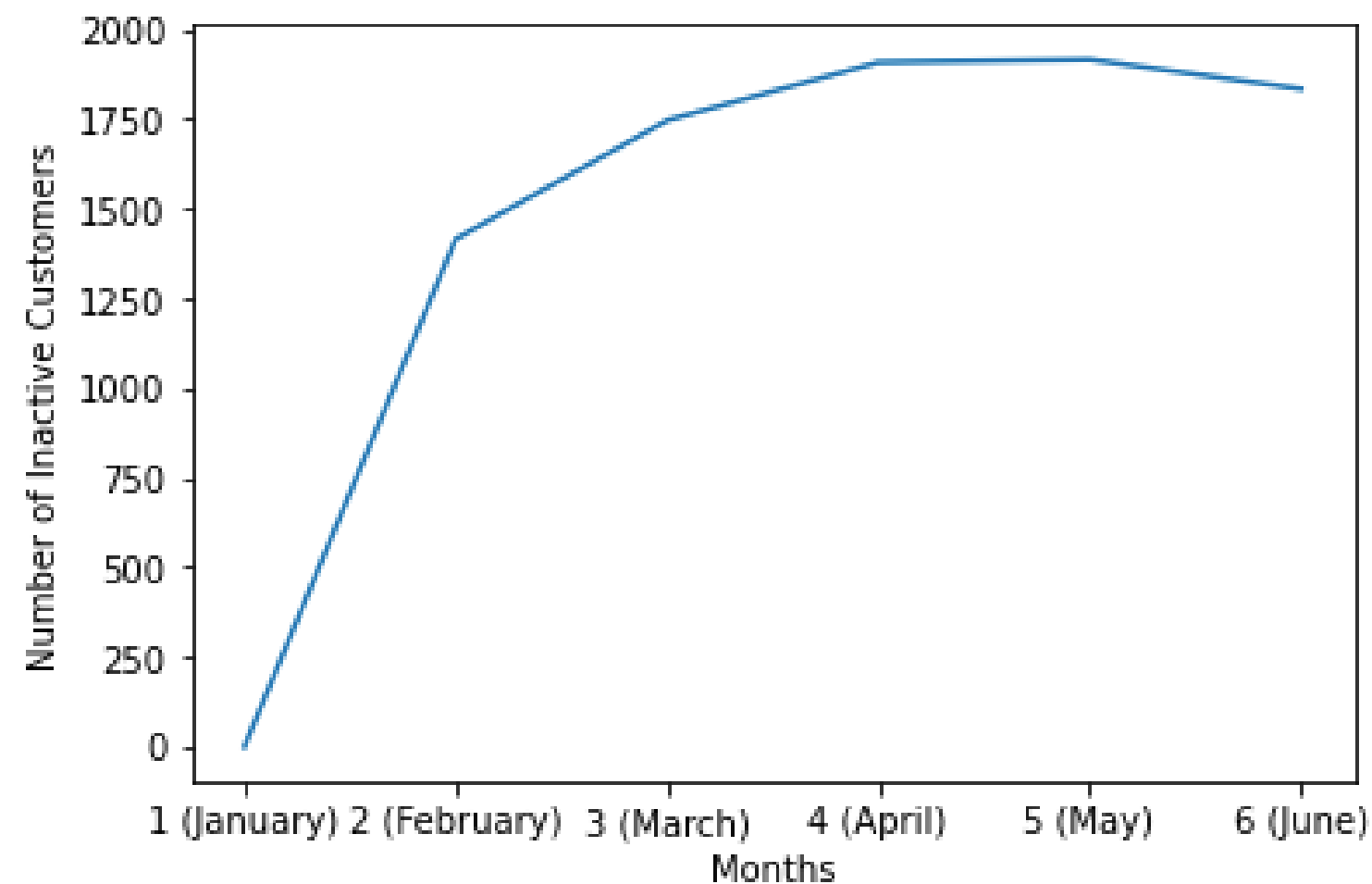
```
[89]: <AxesSubplot:xlabel='Months', ylabel='Number of Repeater Customers'>
```



LINE GRAPH: INACTIVE PER MONTH

```
[88]: #Inactive  
CustomerTypte_df.iloc[1,:].plot(kind='line',xlabel='Months',ylabel='Number of Inactive Customers')
```

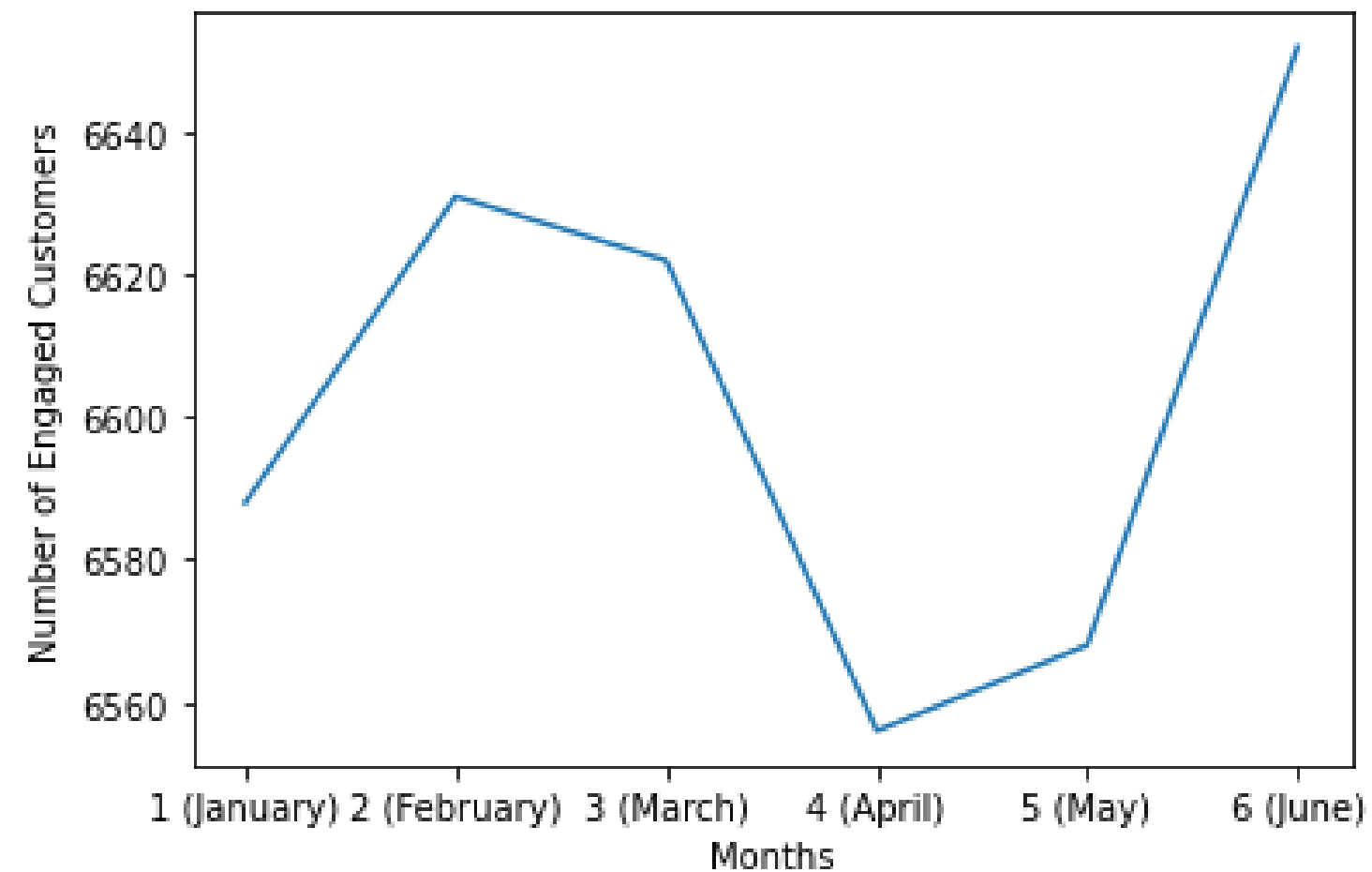
```
[88]: <AxesSubplot:xlabel='Months', ylabel='Number of Inactive Customers'>
```



LINE GRAPH: ENGAGED PER MONTH

```
[86]: #Engaged  
CustomerTypte_df.iloc[2,:].plot(kind='line',xlabel='Months',ylabel='Number of Engaged Customers')
```

```
[86]: <AxesSubplot:xlabel='Months', ylabel='Number of Engaged Customers'>
```



EXTRA TABLES: SEX, GENERATION, NUMBER OF TRANSACTIONS PER MONTH

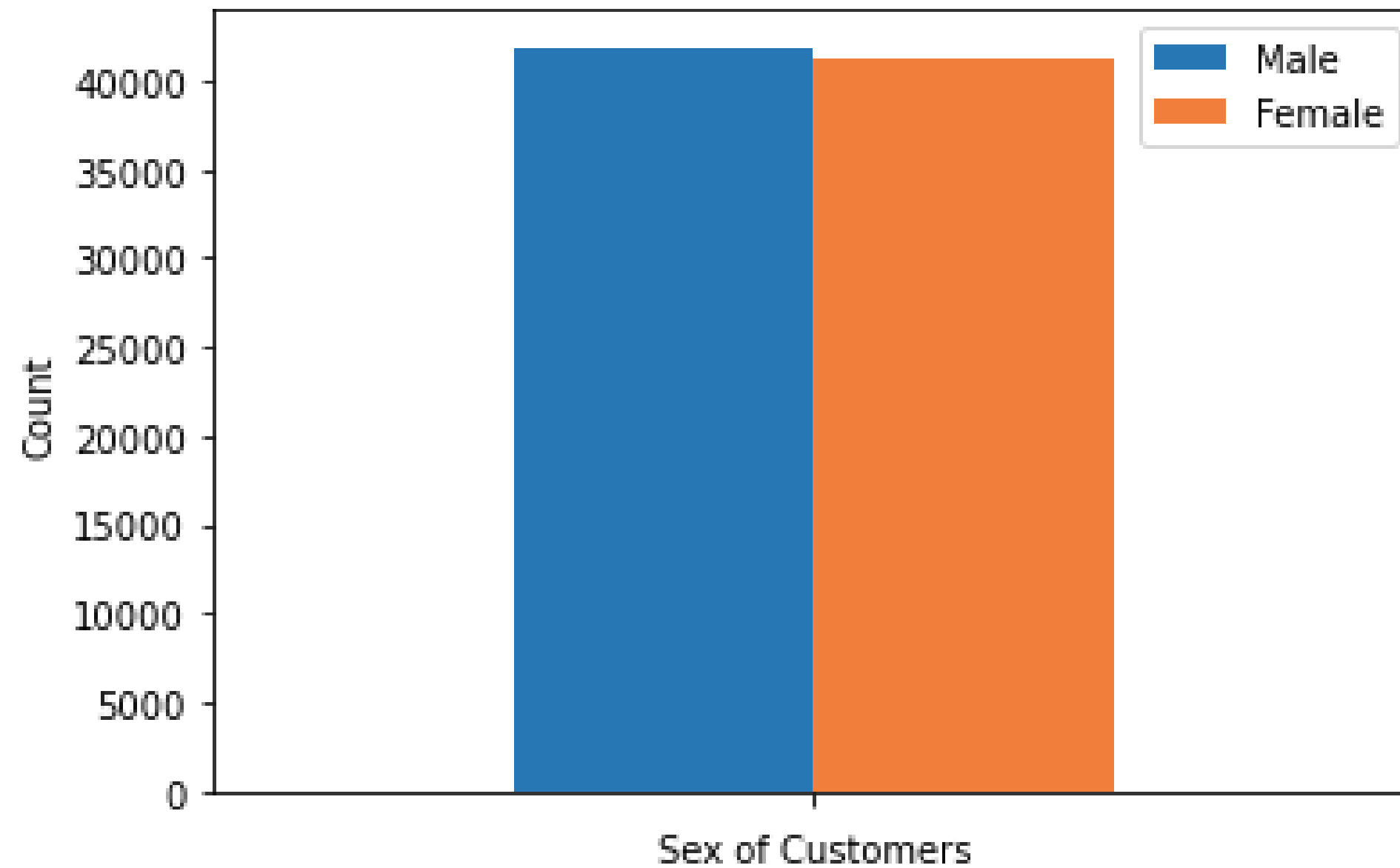
[6]:	Male Female	
	Sex of Customers	
	<hr/>	
	Count	41863 41173

[52]:	January February March April May June					
	Month					
	<hr/>					
	Count	13688	13972	13902	13779	13864 13831

]:	Interbellum Generation Boomer Generation Generation X Xennials Millenials Generation Z Generation Alpha						
	Generation						
	<hr/>						
	Count	16175	5871	13142	11260	11062	11684 6791

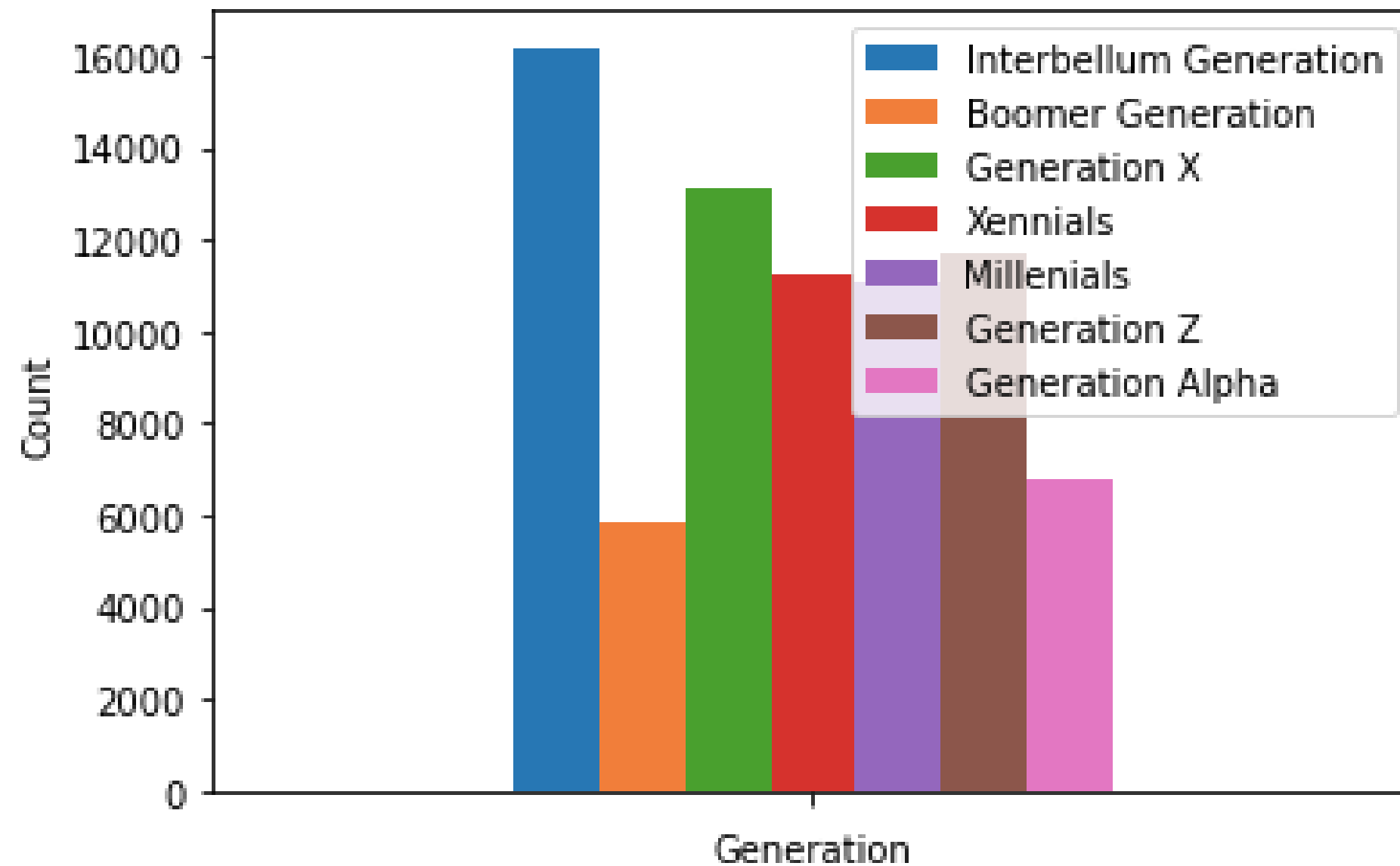
BAR GRAPH: CUSTOMERS BASED ON SEX

```
[152]: <AxesSubplot:xlabel='Sex of Customers', ylabel='Count'>
```



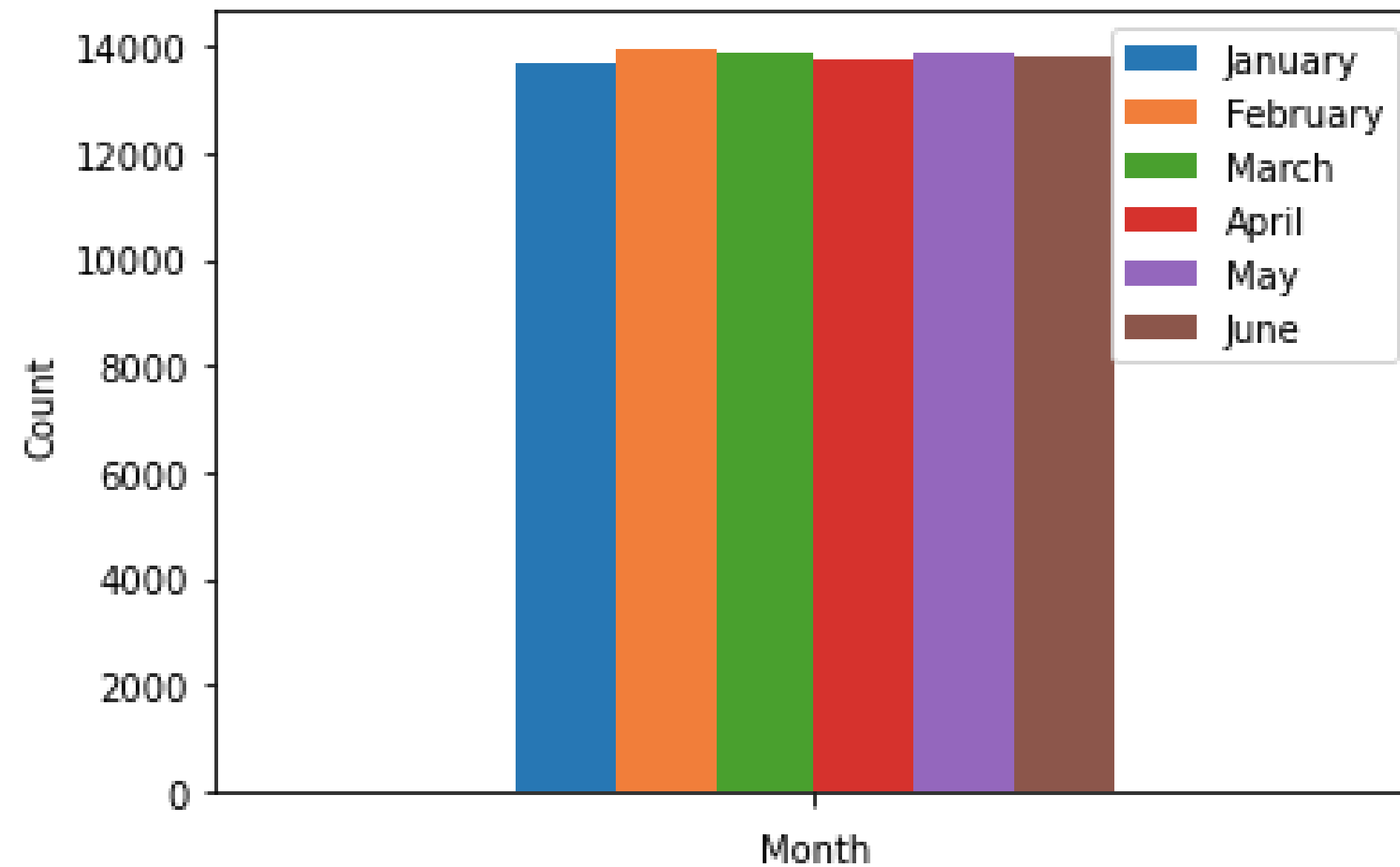
BAR GRAPH: CUSTOMERS BASED ON GENERATION

```
[151]: <AxesSubplot:xlabel='Generation', ylabel='Count'>
```



BAR GRAPH: COUNT OF TRANSACTIONS (ORDERS) PER MONTH

```
[150]: <AxesSubplot:xlabel='Month', ylabel='Count'>
```



THANK YOU!