## ▾ Chapter 7 - Exercise 1: Tips

▾ Cho dữ liệu tips có sẵn trong seaborn library. Hãy vẽ những biểu đồ theo yêu cầu:

```
import numpy as np
import pandas as pd
from matplotlib import pyplot as plt
import seaborn as sns
```

```
# Load dữ liệu tips có sẵn trong seaborn library
#total_bill: Total bill (cost of the meal), including tax, in US dollars
#tip: Tip (gratuity) in US dollars
#sex: Sex of person paying for the meal (0=male, 1=female)
#smoker: Smoker in party? (0=No, 1=Yes)
#day: 3=Thur, 4=Fri, 5=Sat, 6=Sun
#time: 0=Day, 1=Night
#size: Size of the party
tips = sns.load_dataset("tips")
tips.info()
tips.tail(10)
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 244 entries, 0 to 243
Data columns (total 7 columns):
total_bill    244 non-null float64
tip           244 non-null float64
sex           244 non-null category
smoker        244 non-null category
day           244 non-null category
time          244 non-null category
size          244 non-null int64
dtypes: category(4), float64(2), int64(1)
memory usage: 7.3 KB
```

	total_bill	tip	sex	smoker	day	time	size
234	15.53	3.00	Male	Yes	Sat	Dinner	2
235	10.07	1.25	Male	No	Sat	Dinner	2
236	12.60	1.00	Male	Yes	Sat	Dinner	2
237	32.83	1.17	Male	Yes	Sat	Dinner	2
238	35.83	4.67	Female	No	Sat	Dinner	3
239	29.03	5.92	Male	No	Sat	Dinner	3
240	27.18	2.00	Female	Yes	Sat	Dinner	2
241	22.67	2.00	Male	Yes	Sat	Dinner	2
242	17.82	1.75	Male	No	Sat	Dinner	2
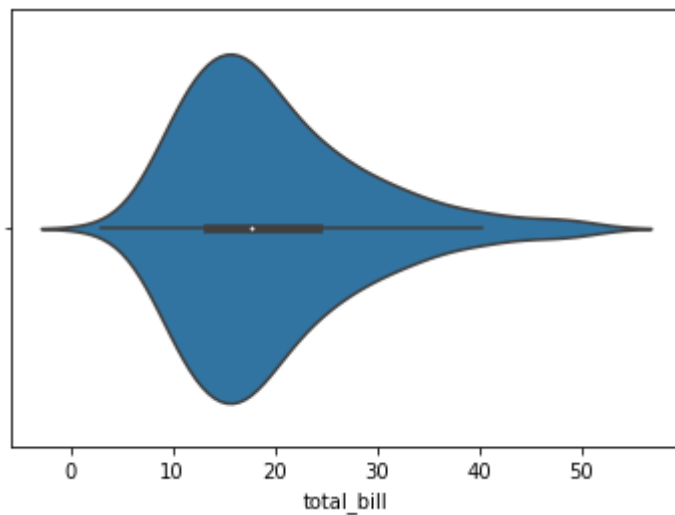
```
# Câu 2: Vẽ swarmplot cho cột total_bill theo sex
# Bạn nhận xét gì về biểu đồ vừa tạo
sns.swarmplot(x="sex", y="total_bill", data=tips)
plt.show()
```
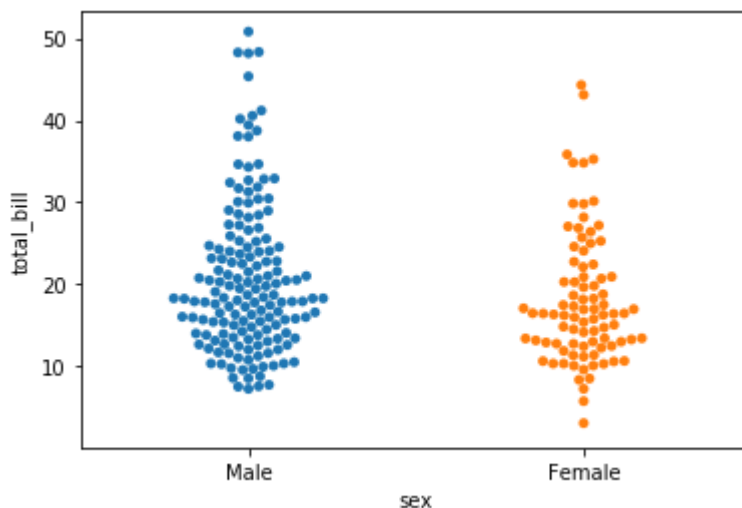


```
# Câu 3: Vẽ boxplot cho cột total_bill
# Bạn nhận xét gì về biểu đồ vừa tạo
sns.boxplot(x="total_bill", data=tips)
plt.show()
```
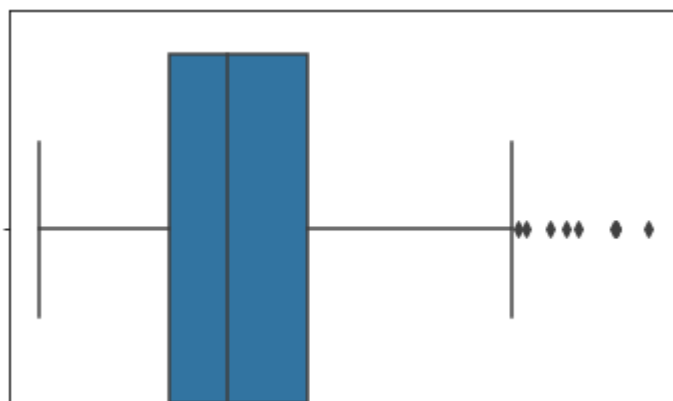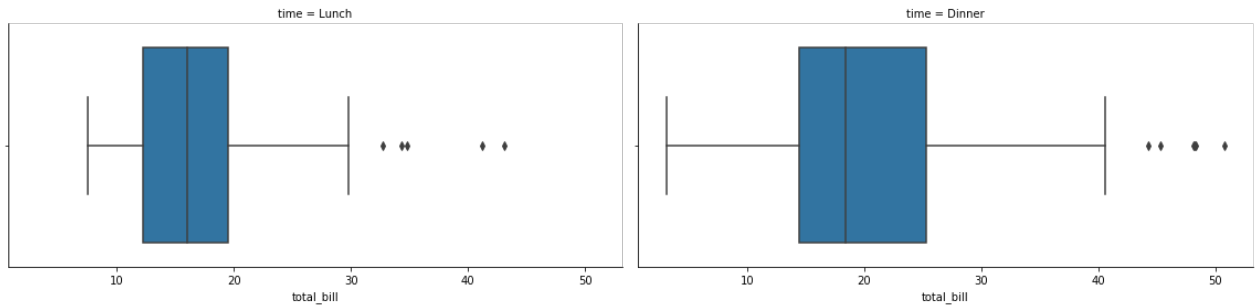
```
# Bạn nhận xét gì về biểu đồ vừa tạo
plt.figure(figsize=(8,6))
fg = sns.FacetGrid(data=tips, col="time", col_order=['Lunch', 'Dinner'], height=4

fg.map(sns.boxplot, 'total_bill', order=None)

plt.show()
plt.clf()
```

```
<Figure size 576x432 with 0 Axes>
```



```
<Figure size 432x288 with 0 Axes>
```

```
# Câu 5: Tạo catplot chứa point plot của giá trị 'total_bill' thay đổi theo size
# Bạn nhận xét gì về biểu đồ vừa tạo
sns.catplot(data=tips, x='size', y='total_bill', kind='point', row='time')

plt.show()
plt.clf()
```

```
<Figure size 432x288 with 0 Axes>
```
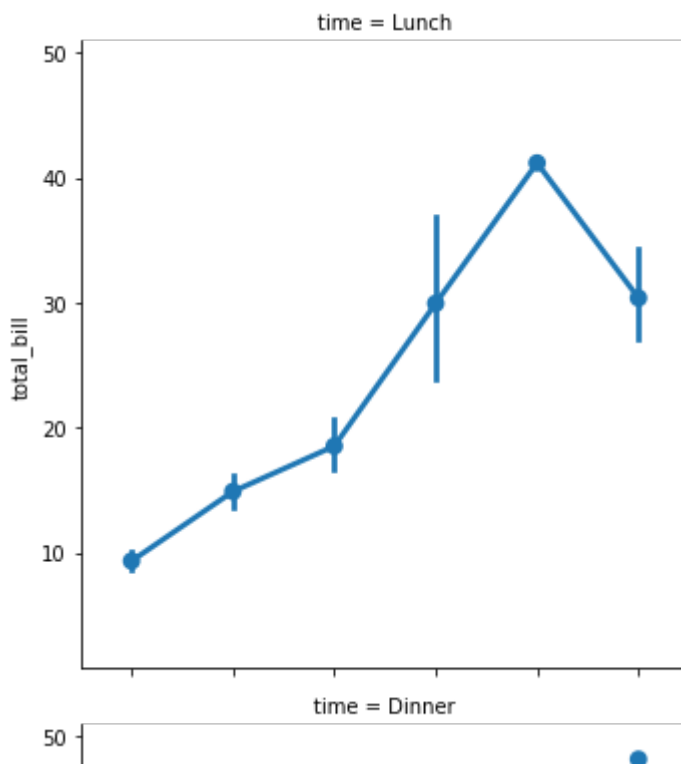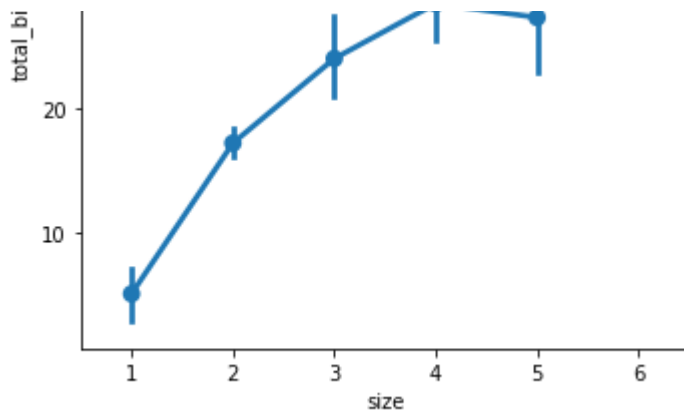
```
# Câu 6: Tạo PairGrid với scatter plot thể hiện liên quan giữa "total_bill" và "t
# Bạn nhận xét gì về biểu đồ vừa tạo
pg = sns.PairGrid(data=tips, vars=["total_bill", "tip"])
pg2 = pg.map(plt.scatter)
plt.show()
plt.clf()
```



```
<Figure size 432x288 with 0 Axes>
```

```
<Figure size 432x288 with 0 Axes>
```

▾ Chapter 7 - Exercise 2: Titanic

▾ Cho dữ liệu titanic có sẵn trong seaborn library. Hãy vẽ những biểu đồ theo yêu cầu, và cho biết nhận xét sau biểu đồ vừa vẽ:

```python
import numpy as np
import pandas as pd
from matplotlib import pyplot as plt
import seaborn as sns
```
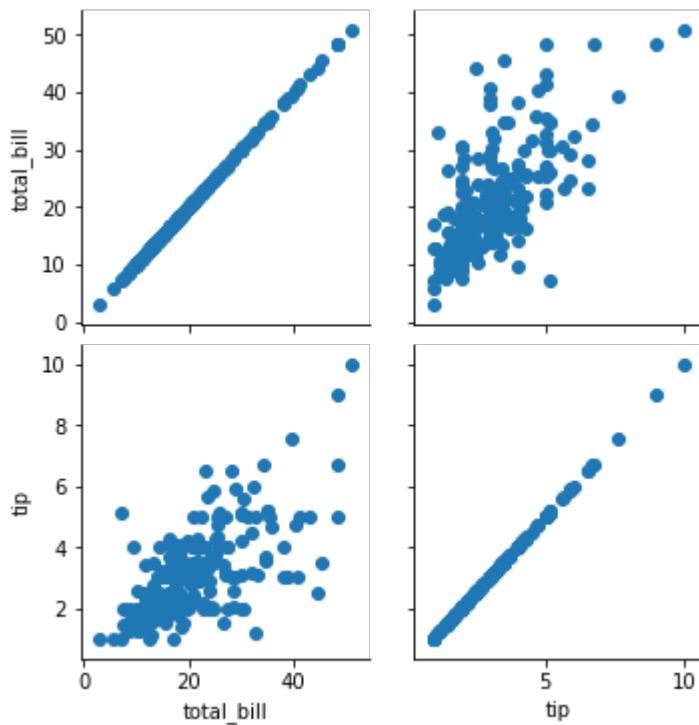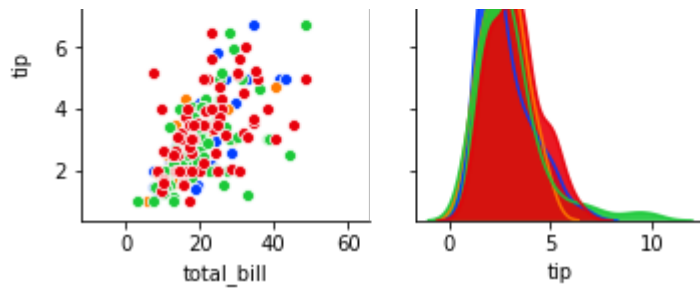
```python
# Load dữ liệu titanic có sẵn trong seaborn library
titanic = sns.load_dataset("titanic")
titanic.info()
titanic.head()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 15 columns):
survived       891 non-null int64
pclass         891 non-null int64
sex            891 non-null object
age            714 non-null float64
sibsp          891 non-null int64
parch          891 non-null int64
fare           891 non-null float64
embarked       889 non-null object
class          891 non-null category
who            891 non-null object
adult_male     891 non-null bool
deck           203 non-null category
embark_town    889 non-null object
alive          891 non-null object
alone          891 non-null bool
dtypes: bool(2), category(2), float64(2), int64(4), object(5)
memory usage: 80.6+ KB
```

	survived	pclass	sex	age	sibsp	parch	fare	embarked	class	who
0	0	3	male	22.0	1	0	7.2500	S	Third	man
1	1	1	female	38.0	1	0	71.2833	C	First	woman
2	1	3	female	26.0	0	0	7.9250	S	Third	woman
3	1	1	female	35.0	1	0	53.1000	S	First	woman
4	0	3	male	35.0	0	0	8.0500	S	Third	man

```python
# Câu 1: Vẽ stripplot thể hiện sự phân bố của fare theo class
# Bạn nhận xét gì về biểu đồ vừa tạo
```
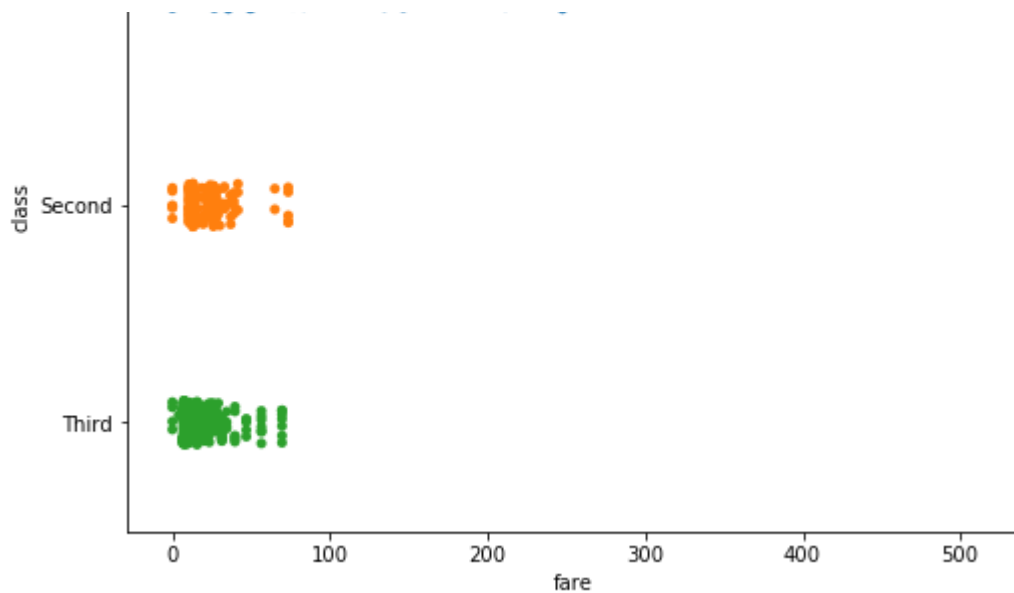
```
# Câu 2: Vẽ violinplot thể hiện sự phân bố của fare theo class
# Bạn nhận xét gì về biểu đồ vừa tạo
plt.figure(figsize=(8,6))
sns.violinplot(data=titanic, x='fare', y='class', palette='husl')
plt.show()
plt.clf()
```



```
<Figure size 432x288 with 0 Axes>
```

```
<Figure size 432x288 with 0 Axes>
```
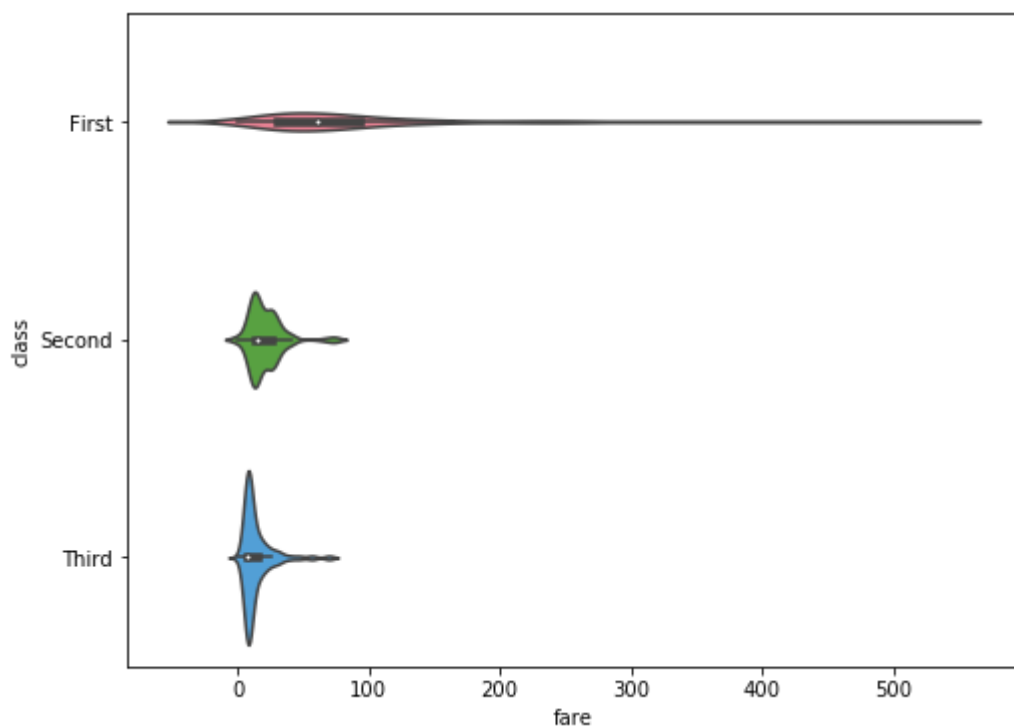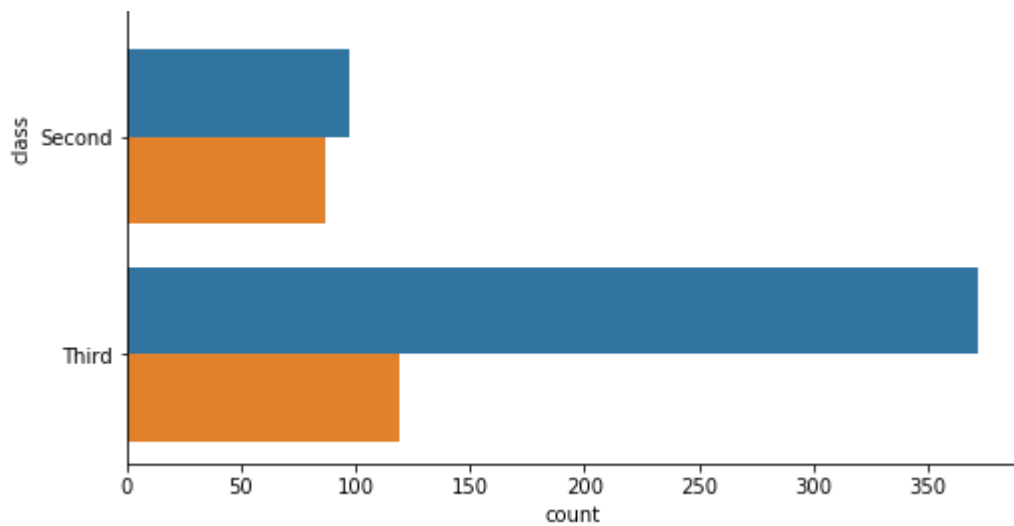
```
# Câu 4: Vẽ pointplot thể hiện khả năng sống sót 'survived' theo class
# Bạn nhận xét gì về biểu đồ vừa tạo
plt.figure(figsize=(8,6))
sns.pointplot(data=titanic, y='survived', x='class', capsize=.1)
plt.show()
plt.clf()
```



```
<Figure size 432x288 with 0 Axes>
```
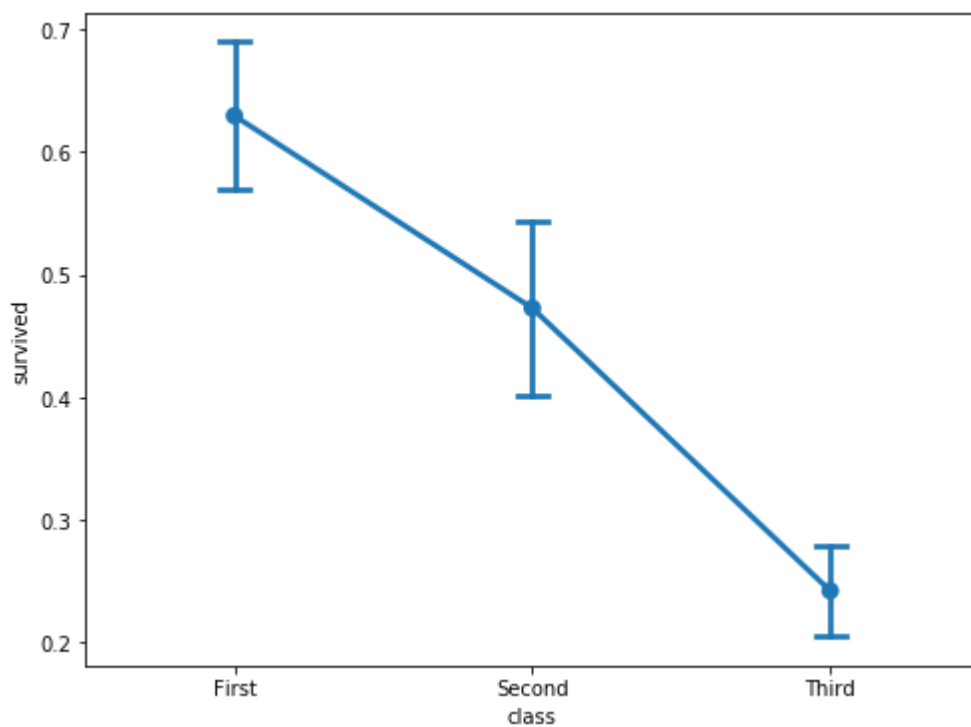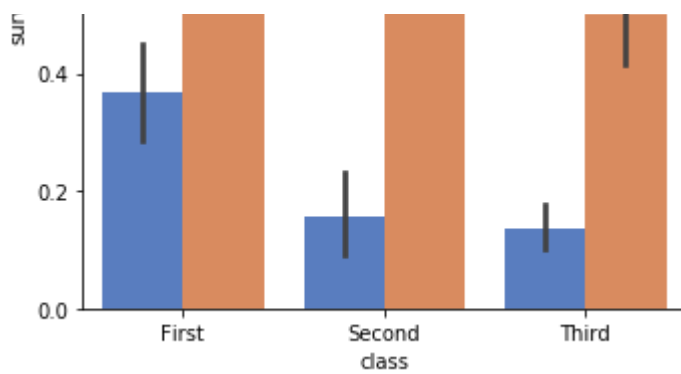
```
# Câu 6: Vẽ correlation matrix (heatmap) của titanic
# Bạn nhận xét gì về biểu đồ vừa tạo
plt.figure(figsize=(10,8))
sns.heatmap(titanic.corr())
plt.show()
```
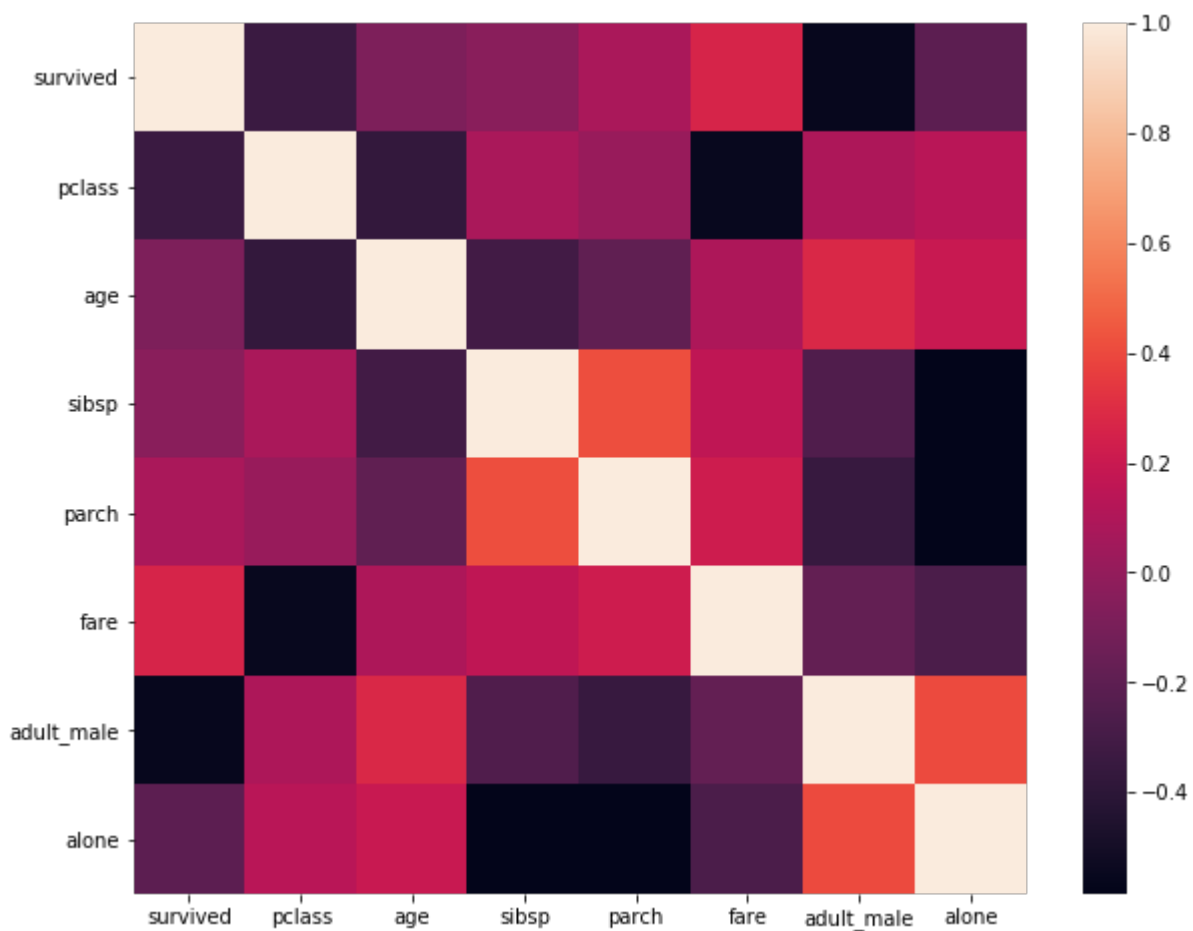
Chapter 7 - Exercise 3: Visualization with Seaborn - Diamond

Nghịch lý Simpson hay hiệu ứng Yule–Simpson, là một nghịch lý trong xác suất và thống kê, trong đó một xu hướng xuất hiện trong dữ liệu sẽ bị đảo ngược khi được phân tích dưới góc nhìn khác.

Cho file dữ liệu diamonds.csv. Hãy thực hiện các yêu cầu sau, để phát hiện nghịch lý Simpson khi phân tích giá kim cương bằng các công cụ trực quan hóa dữ liệu:

```python
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
sns.set_style("darkgrid")
```

```python
# Câu 1: Đọc dữ liệu diamonds.csv, đưa vào biến diamonds
diamonds = pd.read_csv(r'data/diamonds.csv')
diamonds.head()
```

	carat	cut	color	clarity	depth	table	price	x	y	z
0	0.23	Ideal	E	SI2	61.5	55.0	326	3.95	3.98	2.43
1	0.21	Premium	E	SI1	59.8	61.0	326	3.89	3.84	2.31
2	0.23	Good	E	VS1	56.9	65.0	327	4.05	4.07	2.31
3	0.29	Premium	I	VS2	62.4	58.0	334	4.20	4.23	2.63
4	0.31	Good	J	SI2	63.3	58.0	335	4.34	4.35	2.75

```
sns.barplot(x='clarity', y='price', data=diamonds, ax=ax3)
fig.suptitle('Price Decreasing with Increasing Quality?',fontsize=15)
```

    Text(0.5, 0.98, 'Price Decreasing with Increasing Quality?')

Có gì đó không ổn ???

```
# Câu 3: Bây giờ, hãy thử Phân tích chi tiết hơn thuộc tính 'carat' theo 'color' và 'clarity' qua biểu đồ catplot - bar
# Bạn nhận xét gì qua biểu đồ này
plt.rcParams["axes.labelsize"] = 15
sns.catplot(x='color', y='carat', col='clarity', col_wrap=4, data=diamonds, kind='bar')
```

    <seaborn.axisgrid.FacetGrid at 0x5aa11c8e08>
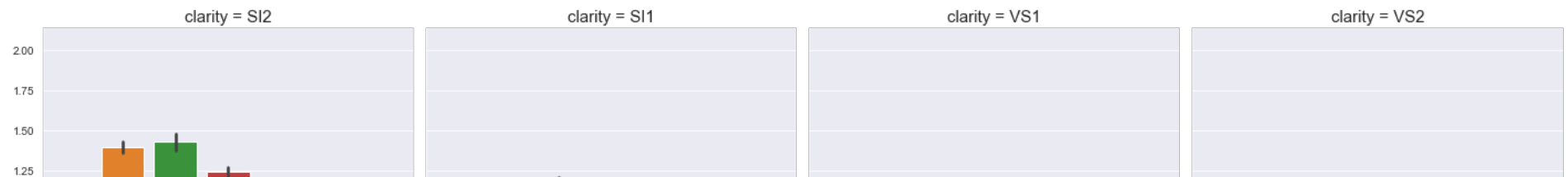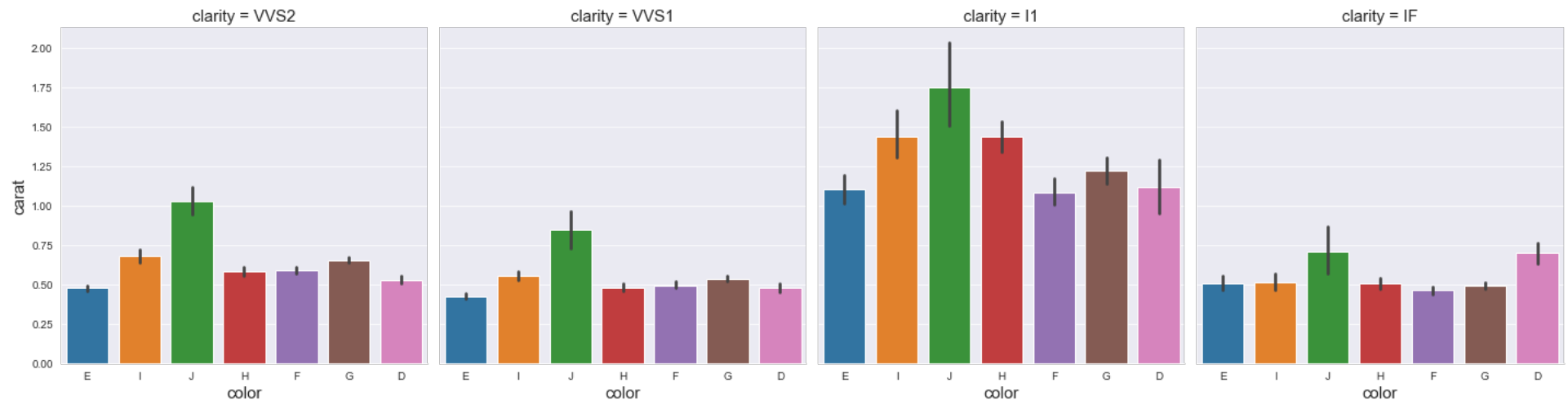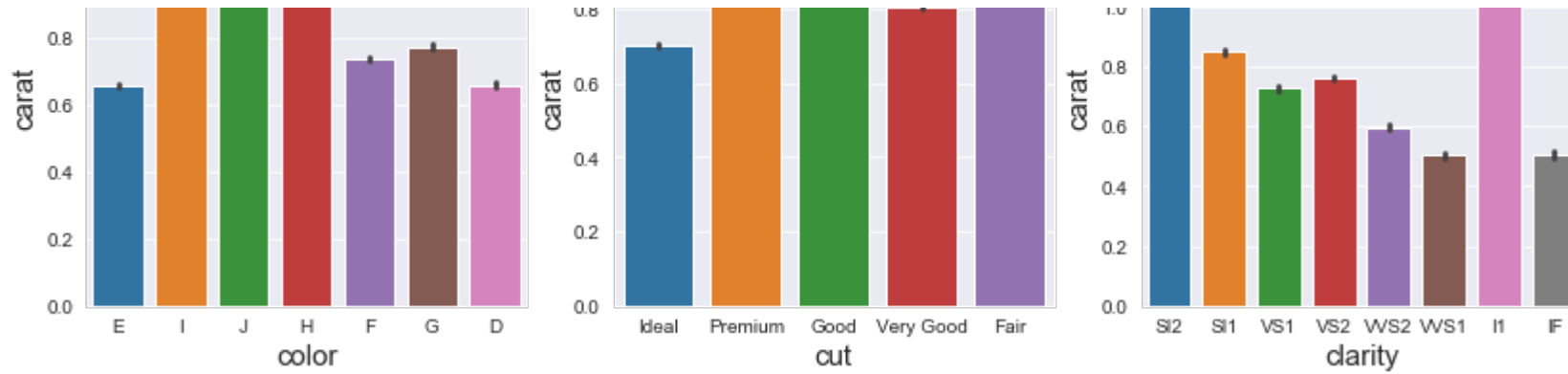
```
# Câu 5: Hãy chia carat ra làm 5 khoảng giá trị, tạo cột diamonds['carat_category'] chứa khoảng giá trị tương ứng
# Hướng dẫn: sử dụng hàm pd.qcut
diamonds['carat_category'] = pd.qcut(diamonds.carat, 5)
diamonds.head()
```

	carat	cut	color	clarity	depth	table	price	x	y	z	carat_category
0	0.23	Ideal	E	SI2	61.5	55.0	326	3.95	3.98	2.43	(0.199, 0.35]
1	0.21	Premium	E	SI1	59.8	61.0	326	3.89	3.84	2.31	(0.199, 0.35]
2	0.23	Good	E	VS1	56.9	65.0	327	4.05	4.07	2.31	(0.199, 0.35]
3	0.29	Premium	I	VS2	62.4	58.0	334	4.20	4.23	2.63	(0.199, 0.35]
4	0.31	Good	J	SI2	63.3	58.0	335	4.34	4.35	2.75	(0.199, 0.35]
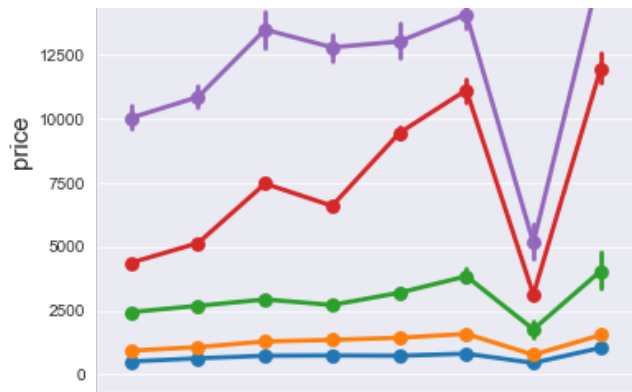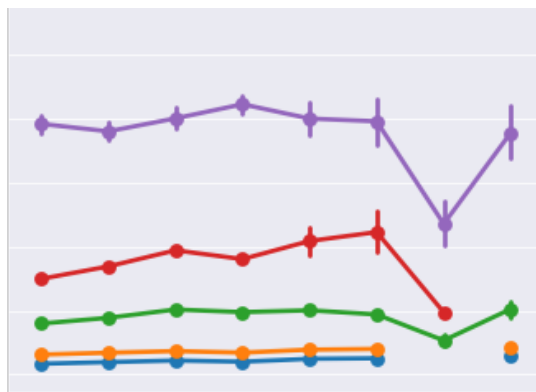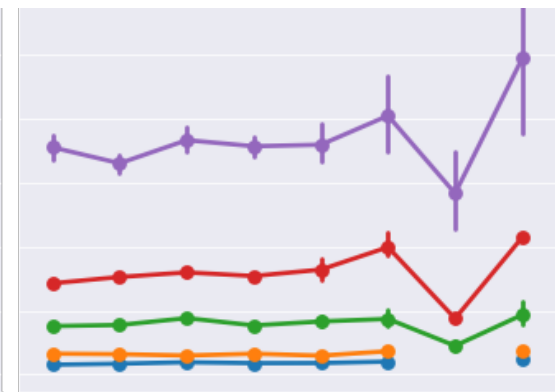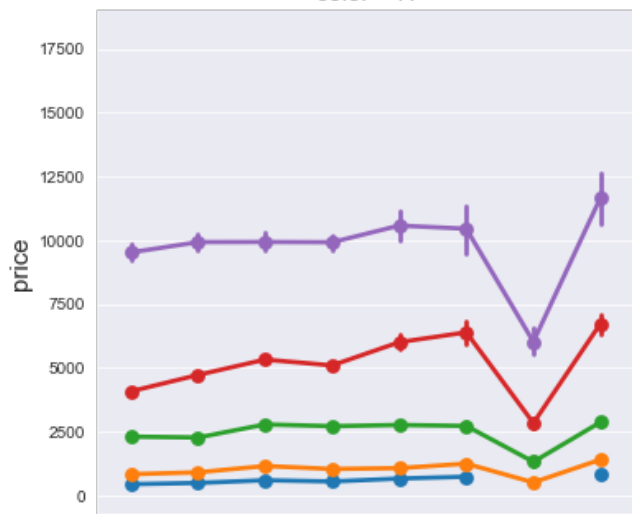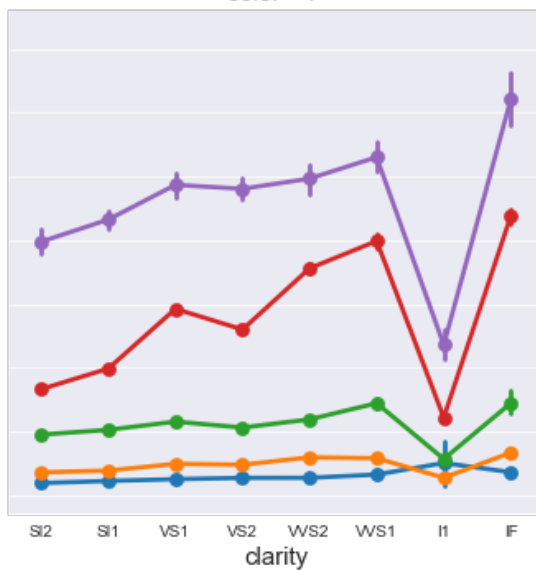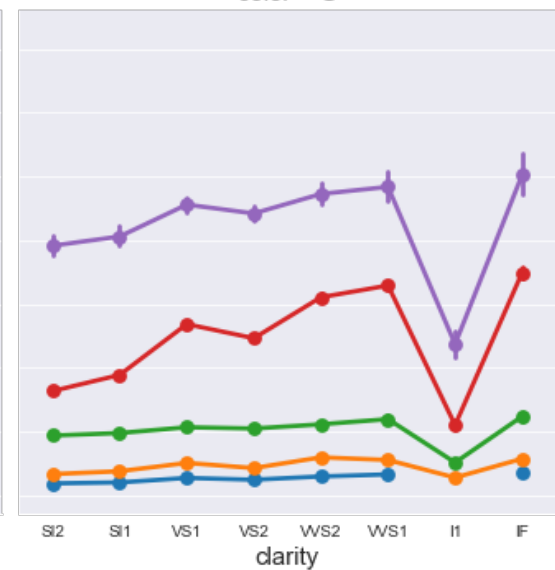
```
# Câu 7: Kết luận
```

carat	cut	color	clarity	depth	table	price	x	y	z
0.23	Ideal	E	SI2	61.5	55	326	3.95	3.98	2.43
0.21	Premium	E	SI1	59.8	61	326	3.89	3.84	2.31
0.23	Good	E	VS1	56.9	65	327	4.05	4.07	2.31
0.29	Premium	I	VS2	62.4	58	334	4.2	4.23	2.63
0.31	Good	J	SI2	63.3	58	335	4.34	4.35	2.75
0.24	Very Good	J	VVS2	62.8	57	336	3.94	3.96	2.48
0.24	Very Good	I	VVS1	62.3	57	336	3.95	3.98	2.47
0.26	Very Good	H	SI1	61.9	55	337	4.07	4.11	2.53
0.22	Fair	E	VS2	65.1	61	337	3.87	3.78	2.49
0.23	Very Good	H	VS1	59.4	61	338	4	4.05	2.39
0.3	Good	J	SI1	64	55	339	4.25	4.28	2.73
0.23	Ideal	J	VS1	62.8	56	340	3.93	3.9	2.46
0.22	Premium	F	SI1	60.4	61	342	3.88	3.84	2.33
0.31	Ideal	J	SI2	62.2	54	344	4.35	4.37	2.71
0.2	Premium	E	SI2	60.2	62	345	3.79	3.75	2.27
0.32	Premium	E	I1	60.9	58	345	4.38	4.42	2.68
0.3	Ideal	I	SI2	62	54	348	4.31	4.34	2.68
0.3	Good	J	SI1	63.4	54	351	4.23	4.29	2.7
0.3	Good	J	SI1	63.8	56	351	4.23	4.26	2.71
0.3	Very Good	J	SI1	62.7	59	351	4.21	4.27	2.66
0.3	Good	I	SI2	63.3	56	351	4.26	4.3	2.71
0.23	Very Good	E	VS2	63.8	55	352	3.85	3.92	2.48
0.23	Very Good	H	VS1	61	57	353	3.94	3.96	2.41
0.31	Very Good	J	SI1	59.4	62	353	4.39	4.43	2.62
0.31	Very Good	J	SI1	58.1	62	353	4.44	4.47	2.59
0.23	Very Good	G	VVS2	60.4	58	354	3.97	4.01	2.41
0.24	Premium	I	VS1	62.5	57	355	3.97	3.94	2.47
0.3	Very Good	J	VS2	62.2	57	357	4.28	4.3	2.67
0.23	Very Good	D	VS2	60.5	61	357	3.96	3.97	2.4
0.23	Very Good	F	VS1	60.9	57	357	3.96	3.99	2.42
0.23	Very Good	F	VS1	60	57	402	4	4.03	2.41
0.23	Very Good	F	VS1	59.8	57	402	4.04	4.06	2.42
0.23	Very Good	E	VS1	60.7	59	402	3.97	4.01	2.42
0.23	Very Good	E	VS1	59.5	58	402	4.01	4.06	2.4
0.23	Very Good	D	VS1	61.9	58	402	3.92	3.96	2.44
0.23	Good	F	VS1	58.2	59	402	4.06	4.08	2.37
0.23	Good	E	VS1	64.1	59	402	3.83	3.85	2.46
0.31	Good	H	SI1	64	54	402	4.29	4.31	2.75
0.26	Very Good	D	VS2	60.8	59	403	4.13	4.16	2.52
0.33	Ideal	I	SI2	61.8	55	403	4.49	4.51	2.78
0.33	Ideal	I	SI2	61.2	56	403	4.49	4.5	2.75
0.33	Ideal	J	SI1	61.1	56	403	4.49	4.55	2.76
0.26	Good	D	VS2	65.2	56	403	3.99	4.02	2.61
0.26	Good	D	VS1	58.4	63	403	4.19	4.24	2.46
0.32	Good	H	SI2	63.1	56	403	4.34	4.37	2.75
0.29	Premium	F	SI1	62.4	58	403	4.24	4.26	2.65
0.32	Very Good	H	SI2	61.8	55	403	4.35	4.42	2.71
0.32	Good	H	SI2	63.8	56	403	4.36	4.38	2.79
0.25	Very Good	E	VS2	63.3	60	404	4	4.03	2.54

0.29	Very Good	H	SI2	60.7	60	404	4.33	4.37	2.64
0.24	Very Good	F	SI1	60.9	61	404	4.02	4.03	2.45
0.23	Ideal	G	VS1	61.9	54	404	3.93	3.95	2.44
0.32	Ideal	I	SI1	60.9	55	404	4.45	4.48	2.72
0.22	Premium	E	VS2	61.6	58	404	3.93	3.89	2.41
0.22	Premium	D	VS2	59.3	62	404	3.91	3.88	2.31
0.3	Ideal	I	SI2	61	59	405	4.3	4.33	2.63
0.3	Premium	J	SI2	59.3	61	405	4.43	4.38	2.61
0.3	Very Good	I	SI1	62.6	57	405	4.25	4.28	2.67
0.3	Very Good	I	SI1	63	57	405	4.28	4.32	2.71
0.3	Good	I	SI1	63.2	55	405	4.25	4.29	2.7
0.35	Ideal	I	VS1	60.9	57	552	4.54	4.59	2.78
0.3	Premium	D	SI1	62.6	59	552	4.23	4.27	2.66
0.3	Ideal	D	SI1	62.5	57	552	4.29	4.32	2.69
0.3	Ideal	D	SI1	62.1	56	552	4.3	4.33	2.68
0.42	Premium	I	SI2	61.5	59	552	4.78	4.84	2.96
0.28	Ideal	G	VVS2	61.4	56	553	4.19	4.22	2.58
0.32	Ideal	I	VVS1	62	55.3	553	4.39	4.42	2.73
0.31	Very Good	G	SI1	63.3	57	553	4.33	4.3	2.73
0.31	Premium	G	SI1	61.8	58	553	4.35	4.32	2.68
0.24	Premium	E	VVS1	60.7	58	553	4.01	4.03	2.44
0.24	Very Good	D	VVS1	61.5	60	553	3.97	4	2.45
0.3	Very Good	H	SI1	63.1	56	554	4.29	4.27	2.7
0.3	Premium	H	SI1	62.9	59	554	4.28	4.24	2.68
0.3	Premium	H	SI1	62.5	57	554	4.29	4.25	2.67
0.3	Good	H	SI1	63.7	57	554	4.28	4.26	2.72
0.26	Very Good	F	VVS2	59.2	60	554	4.19	4.22	2.49
0.26	Very Good	E	VVS2	59.9	58	554	4.15	4.23	2.51
0.26	Very Good	D	VVS2	62.4	54	554	4.08	4.13	2.56
0.26	Very Good	D	VVS2	62.8	60	554	4.01	4.05	2.53
0.26	Very Good	E	VVS1	62.6	59	554	4.06	4.09	2.55
0.26	Very Good	E	VVS1	63.4	59	554	4	4.04	2.55
0.26	Very Good	D	VVS1	62.1	60	554	4.03	4.12	2.53
0.26	Ideal	E	VVS2	62.9	58	554	4.02	4.06	2.54
0.38	Ideal	I	SI2	61.6	56	554	4.65	4.67	2.87
0.26	Good	E	VVS1	57.9	60	554	4.22	4.25	2.45
0.24	Premium	G	VVS1	62.3	59	554	3.95	3.92	2.45
0.24	Premium	H	VVS1	61.2	58	554	4.01	3.96	2.44
0.24	Premium	H	VVS1	60.8	59	554	4.02	4	2.44
0.24	Premium	H	VVS2	60.7	58	554	4.07	4.04	2.46
0.32	Premium	I	SI1	62.9	58	554	4.35	4.33	2.73
0.7	Ideal	E	SI1	62.5	57	2757	5.7	5.72	3.57
0.86	Fair	E	SI2	55.1	69	2757	6.45	6.33	3.52
0.7	Ideal	G	VS2	61.6	56	2757	5.7	5.67	3.5
0.71	Very Good	E	VS2	62.4	57	2759	5.68	5.73	3.56
0.78	Very Good	G	SI2	63.8	56	2759	5.81	5.85	3.72
0.7	Good	E	VS2	57.5	58	2759	5.85	5.9	3.38
0.7	Good	F	VS1	59.4	62	2759	5.71	5.76	3.4
0.96	Fair	F	SI2	66.3	62	2759	6.27	5.95	4.07
0.73	Very Good	E	SI1	61.6	59	2760	5.77	5.78	3.56

0.8	Premium	H	SI1	61.5	58	2760	5.97	5.93	3.66
0.75	Very Good	D	SI1	63.2	56	2760	5.8	5.75	3.65
0.75	Premium	E	SI1	59.9	54	2760	6	5.96	3.58
0.74	Ideal	G	SI1	61.6	55	2760	5.8	5.85	3.59
0.75	Premium	G	VS2	61.7	58	2760	5.85	5.79	3.59
0.8	Ideal	I	VS1	62.9	56	2760	5.94	5.87	3.72
0.75	Ideal	G	SI1	62.2	55	2760	5.87	5.8	3.63
0.8	Premium	G	SI1	63	59	2760	5.9	5.81	3.69
0.74	Ideal	I	VVS2	62.3	55	2761	5.77	5.81	3.61
0.81	Ideal	F	SI2	58.8	57	2761	6.14	6.11	3.6
0.59	Ideal	E	VVS2	62	55	2761	5.38	5.43	3.35
0.8	Ideal	F	SI2	61.4	57	2761	5.96	6	3.67
0.74	Ideal	E	SI2	62.2	56	2761	5.8	5.84	3.62
0.9	Premium	I	VS2	63	58	2761	6.16	6.12	3.87
0.74	Very Good	G	SI1	62.2	59	2762	5.73	5.82	3.59
0.73	Ideal	F	VS2	62.6	56	2762	5.77	5.74	3.6
0.73	Ideal	F	VS2	62.7	53	2762	5.8	5.75	3.62
0.8	Premium	F	SI2	61.7	58	2762	5.98	5.94	3.68
0.71	Ideal	G	VS2	62.4	54	2762	5.72	5.76	3.58
0.7	Ideal	E	VS2	60.7	58	2762	5.73	5.76	3.49
0.8	Ideal	F	SI2	59.9	59	2762	6.01	6.07	3.62
0.71	Ideal	D	SI2	62.3	56	2762	5.73	5.69	3.56
0.74	Ideal	E	SI1	62.3	54	2762	5.8	5.83	3.62
0.7	Very Good	F	VS2	61.7	63	2762	5.64	5.61	3.47
0.7	Fair	F	VS2	64.5	57	2762	5.57	5.53	3.58
0.7	Fair	F	VS2	65.3	55	2762	5.63	5.58	3.66
0.7	Premium	F	VS2	61.6	60	2762	5.65	5.59	3.46
0.91	Premium	H	SI1	61.4	56	2763	6.09	5.97	3.7
0.61	Very Good	D	VVS2	59.6	57	2763	5.56	5.58	3.32
0.91	Fair	H	SI2	64.4	57	2763	6.11	6.09	3.93
0.91	Fair	H	SI2	65.7	60	2763	6.03	5.99	3.95
0.77	Ideal	H	VS2	62	56	2763	5.89	5.86	3.64
0.71	Very Good	D	SI1	63.6	58	2764	5.64	5.68	3.6
0.71	Ideal	D	SI1	61.9	59	2764	5.69	5.72	3.53
0.7	Very Good	E	VS2	62.6	60	2765	5.62	5.65	3.53
0.77	Very Good	H	VS1	61.3	60	2765	5.88	5.9	3.61
0.63	Premium	E	VVS1	60.9	60	2765	5.52	5.55	3.37
0.71	Very Good	F	VS1	60.1	62	2765	5.74	5.77	3.46
0.71	Premium	F	VS1	61.8	59	2765	5.69	5.73	3.53
0.76	Ideal	H	SI1	61.2	57	2765	5.88	5.91	3.61
0.64	Ideal	G	VVS1	61.9	56	2766	5.53	5.56	3.43
0.71	Premium	G	VS2	60.9	57	2766	5.78	5.75	3.51
0.71	Premium	G	VS2	59.8	56	2766	5.89	5.81	3.5
0.7	Very Good	D	VS2	61.8	55	2767	5.68	5.72	3.52
0.7	Very Good	F	VS1	60	57	2767	5.8	5.87	3.5
0.71	Ideal	D	SI2	61.6	55	2767	5.74	5.76	3.54
0.7	Good	H	VVS2	62.1	64	2767	5.62	5.65	3.5
0.71	Very Good	G	VS1	63.3	59	2768	5.52	5.61	3.52
0.73	Very Good	D	SI1	60.2	56	2768	5.83	5.87	3.52
0.7	Very Good	D	SI1	61.1	58	2768	5.66	5.73	3.48

0.7	Ideal	E	SI1	60.9	57	2768	5.73	5.76	3.5
0.71	Premium	D	SI2	61.7	59	2768	5.71	5.67	3.51
0.74	Ideal	I	SI1	61.3	56	2769	5.82	5.86	3.57
0.71	Premium	D	VS2	62.5	60	2770	5.65	5.61	3.52
0.73	Premium	G	VS2	61.4	59	2770	5.83	5.76	3.56
0.76	Very Good	F	SI1	62.9	57	2770	5.79	5.81	3.65
0.76	Ideal	D	SI2	62.4	57	2770	5.78	5.83	3.62
0.71	Ideal	F	SI1	60.7	56	2770	5.77	5.8	3.51
0.73	Premium	G	VS2	60.7	58	2770	5.87	5.82	3.55
0.73	Premium	G	VS1	61.5	58	2770	5.79	5.75	3.55
0.73	Ideal	D	SI2	59.9	57	2770	5.92	5.89	3.54
0.73	Premium	G	VS2	59.2	59	2770	5.92	5.87	3.49
0.72	Very Good	H	VVS2	60.3	56	2771	5.81	5.83	3.51
0.73	Very Good	F	SI1	61.7	60	2771	5.79	5.82	3.58
0.71	Ideal	G	VS2	61.9	57	2771	5.73	5.77	3.56
0.79	Ideal	F	SI2	61.9	55	2771	5.97	5.92	3.68
0.73	Very Good	H	VVS1	60.4	59	2772	5.83	5.89	3.54
0.8	Very Good	F	SI2	61	57	2772	6.01	6.03	3.67
0.58	Ideal	G	VVS1	61.5	55	2772	5.39	5.44	3.33
0.58	Ideal	F	VVS1	61.7	56	2772	5.33	5.37	3.3
0.71	Good	E	VS2	59.2	61	2772	5.8	5.88	3.46
0.75	Ideal	D	SI2	61.3	56	2773	5.85	5.89	3.6
0.7	Premium	D	VS2	58	62	2773	5.87	5.78	3.38
1.17	Very Good	J	I1	60.2	61	2774	6.83	6.9	4.13
0.6	Ideal	E	VS1	61.7	55	2774	5.41	5.44	3.35
0.7	Ideal	E	SI1	62.7	55	2774	5.68	5.74	3.58
0.83	Good	I	VS2	64.6	54	2774	5.85	5.88	3.79
0.74	Very Good	F	VS2	61.3	61	2775	5.8	5.84	3.57
0.72	Very Good	G	VS2	63.7	56.4	2776	5.62	5.69	3.61
0.71	Premium	E	VS2	62.7	58	2776	5.74	5.68	3.58
0.71	Ideal	E	VS2	62.2	57	2776	5.79	5.62	3.55
0.54	Ideal	E	VVS2	61.6	56	2776	5.25	5.27	3.24
0.54	Ideal	E	VVS2	61.5	57	2776	5.24	5.26	3.23
0.72	Ideal	G	SI1	61.8	56	2776	5.72	5.75	3.55
0.72	Ideal	G	SI1	60.7	56	2776	5.79	5.82	3.53
0.72	Good	G	VS2	59.7	60.5	2776	5.8	5.84	3.47
0.71	Ideal	G	SI1	60.5	56	2776	5.8	5.76	3.5
0.7	Very Good	D	VS1	62.7	58	2777	5.66	5.73	3.57
0.71	Premium	F	VS2	62.1	58	2777	5.67	5.7	3.53
0.71	Very Good	F	VS2	62.8	57	2777	5.64	5.69	3.56
0.71	Good	F	VS2	63.8	58	2777	5.61	5.64	3.59
0.71	Good	F	VS2	57.8	60	2777	5.87	5.9	3.4
0.7	Ideal	E	VS2	62.1	55	2777	5.7	5.67	3.53
0.7	Premium	E	VS2	61.1	60	2777	5.71	5.64	3.47
0.7	Premium	E	SI1	60	59	2777	5.79	5.75	3.46
0.7	Premium	E	SI1	61.2	57	2777	5.73	5.68	3.49
0.7	Premium	E	SI1	62.7	59	2777	5.67	5.63	3.54
0.7	Premium	E	SI1	61	57	2777	5.73	5.68	3.48
0.7	Premium	E	SI1	61	58	2777	5.78	5.72	3.51
0.7	Ideal	E	SI1	61.4	57	2777	5.76	5.7	3.52