diamonds_data_analysis

June 7, 2020

[1]:
```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
import plotly.express as px
```

0.1 import files

[2]:
```
diamonds = pd.read_csv("dataset/diamonds.csv", index_col=0)
```

0.2 Create volume of diamonds that contains x * y * z

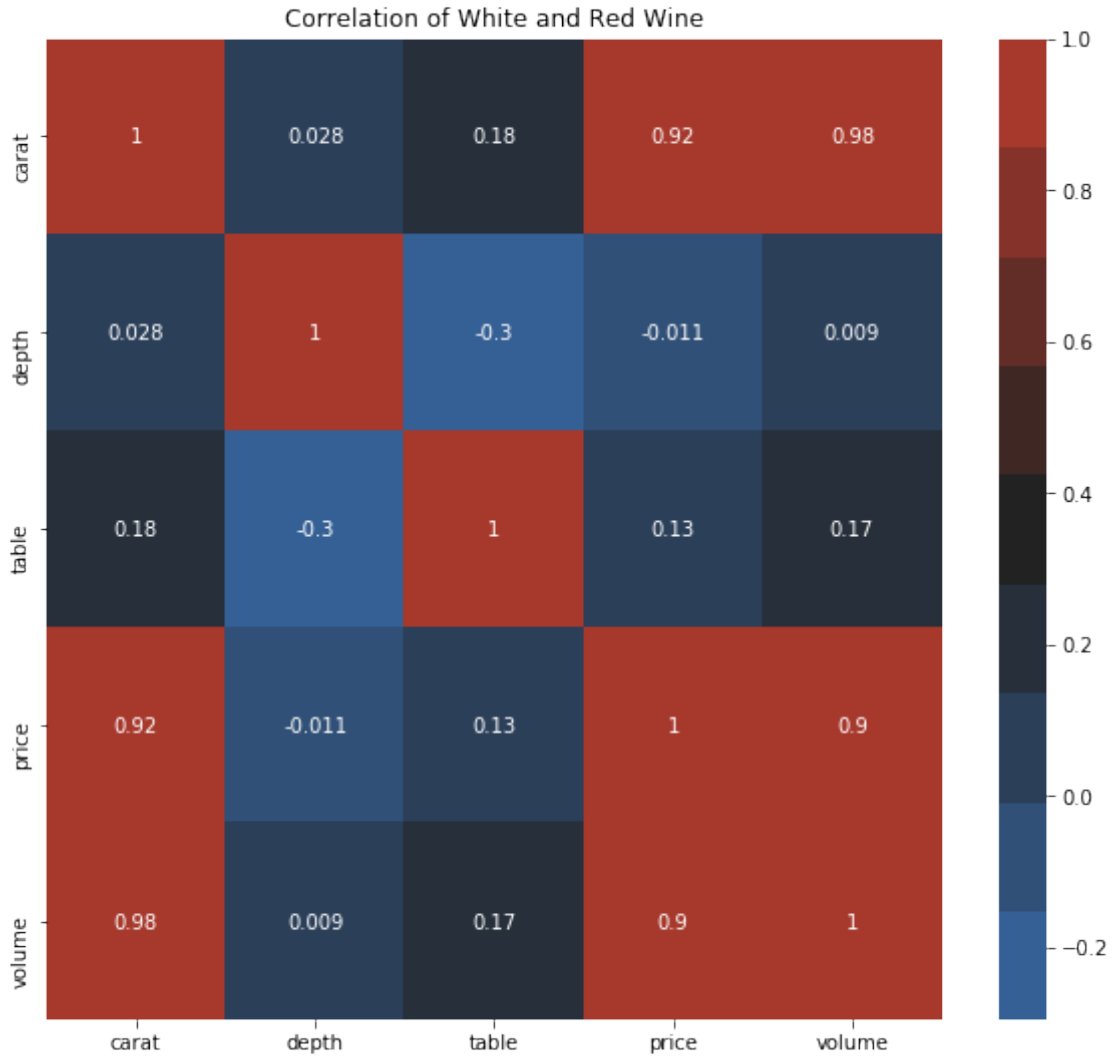
[3]:
```
diamonds["volume"] = diamonds["x"] * diamonds["y"] * diamonds["z"]
diamonds = diamonds.drop(["x", "y", "z"], axis= 1)
diamonds = diamonds.drop(diamonds.index[diamonds["volume"]== 0], axis= 0)
```

[4]:
```
diamonds.head()
```

[4]:

	carat	cut	color	clarity	depth	table	price	volume
1	0.23	Ideal	E	SI2	61.5	55.0	326	38.202030
2	0.21	Premium	E	SI1	59.8	61.0	326	34.505856
3	0.23	Good	E	VS1	56.9	65.0	327	38.076885
4	0.29	Premium	I	VS2	62.4	58.0	334	46.724580
5	0.31	Good	J	SI2	63.3	58.0	335	51.917250

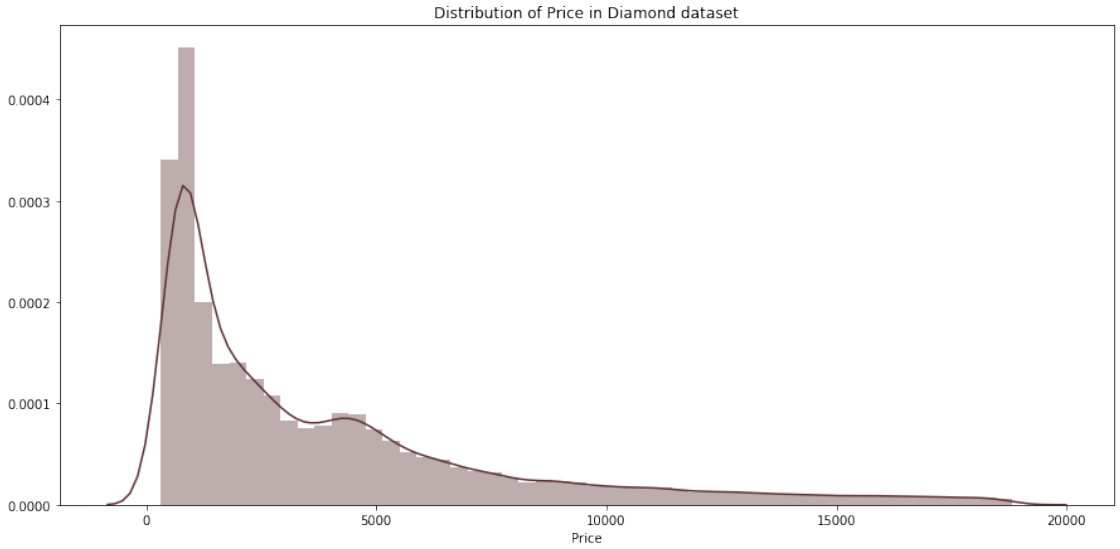
[5]:
```
plt.figure(figsize=(10, 9))
df_corr = diamonds.corr()
sns.heatmap(df_corr, cmap= sns.diverging_palette(250, 15, s=75, l=40,n=9,␣
↪center="dark"), annot=True)
plt.title("Correlation of White and Red Wine")
plt.show()
```



0.3 Distribution of "Price" and "Carat"

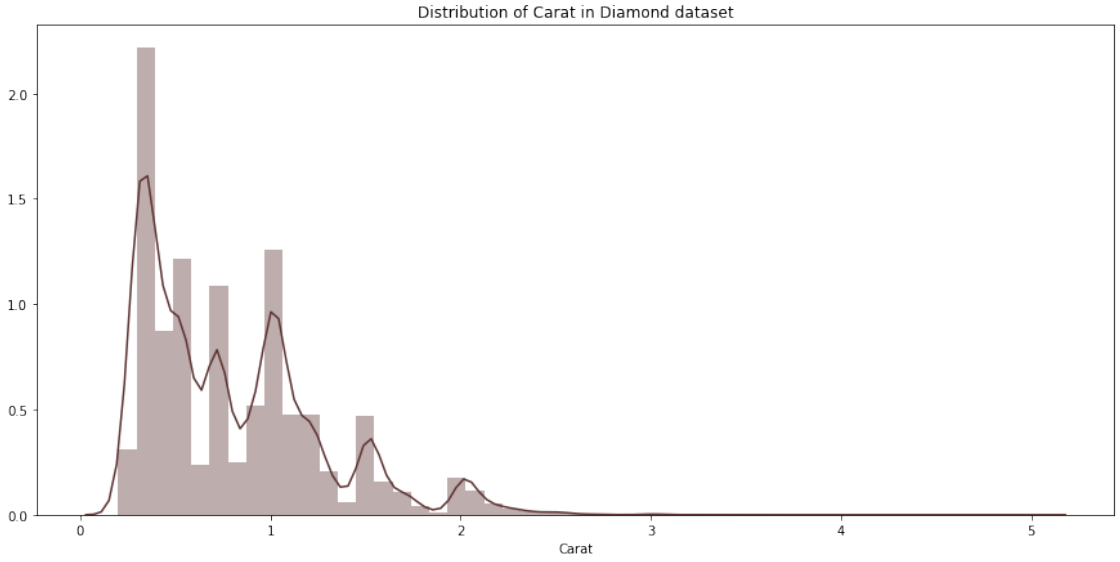
[6]:
```
plt.figure(figsize=(15, 7))
sns.distplot(diamonds["price"], color="#5E3434")
plt.xlabel("Price")
plt.title("Distribution of Price in Diamond dataset")
print("Highest Price in Diamond dataset: ", diamonds["price"].max())
plt.show()
```

```
Highest Price in Diamond dataset:  18823
```



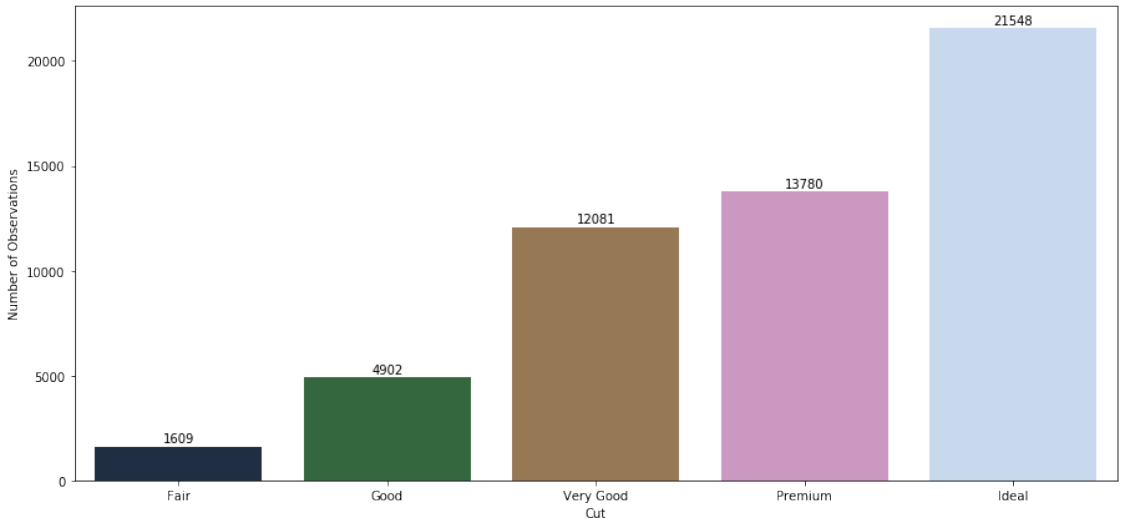
[14]:
```
plt.figure(figsize=(15, 7))
sns.distplot(diamonds["carat"], color="#5E3434")
plt.xlabel("Carat")
plt.title("Distribution of Carat in Diamond dataset")
print("Highest Carat in Diamond dataset: ", diamonds["carat"].max())
plt.show()
```

```
Highest Carat in Diamond dataset:  5.01
```

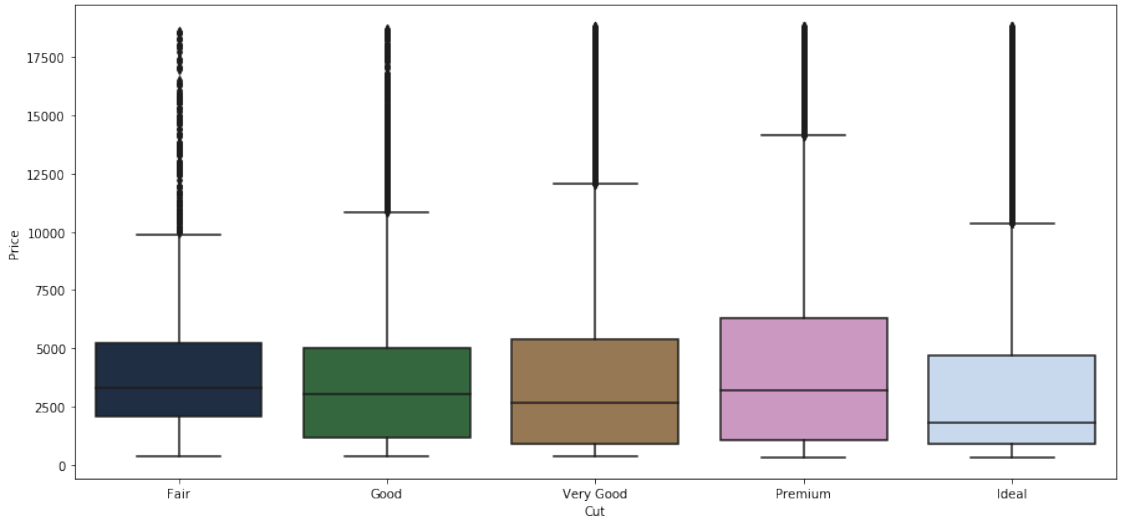


1 Cut plots

[8]:
```
# From Worst to Best (Fair= Worst) ,(Ideal= Best)
plt.figure(figsize= (15, 7))
cut = sns.countplot(x= "cut", data= diamonds, palette= sns.
 ↪color_palette("cubehelix", 5),
              order=["Fair", "Good", "Very Good", "Premium", "Ideal"])
plt.xlabel("Cut")
plt.ylabel("Number of Observations")
for p in cut.patches:
    height = p.get_height().round(2)
    text = str(height)
    cut.text(p.get_x()+p.get_width()/2,height + 200,text, ha="center")
plt.show()
```



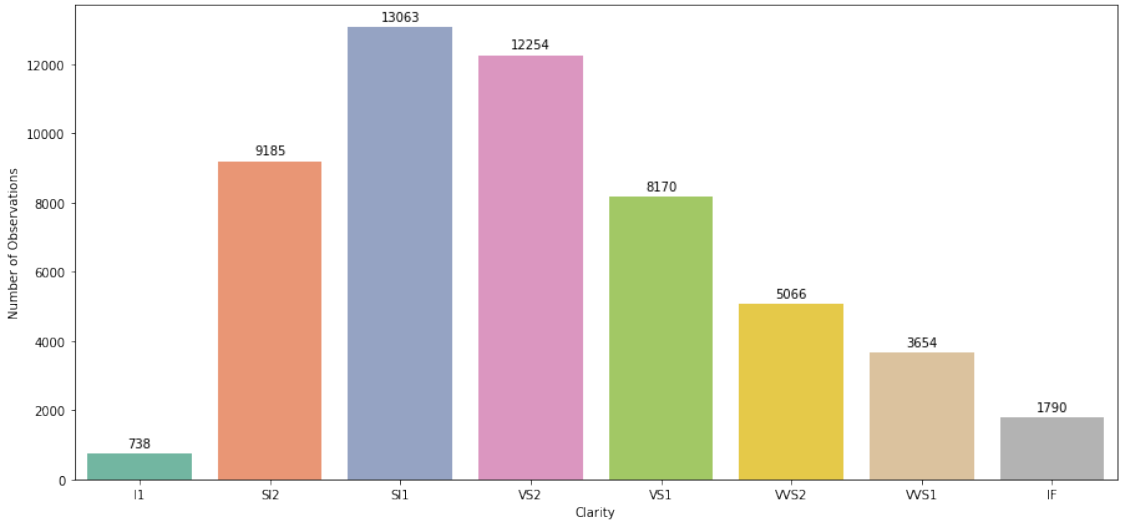
[9]:
```
plt.figure(figsize= (15, 7))
sns.boxplot(x= "cut", y= "price", data= diamonds, palette= sns.
 ↪color_palette("cubehelix", 5),
            order=["Fair", "Good", "Very Good", "Premium", "Ideal"])
plt.xlabel("Cut")
plt.ylabel("Price")
plt.show()
```



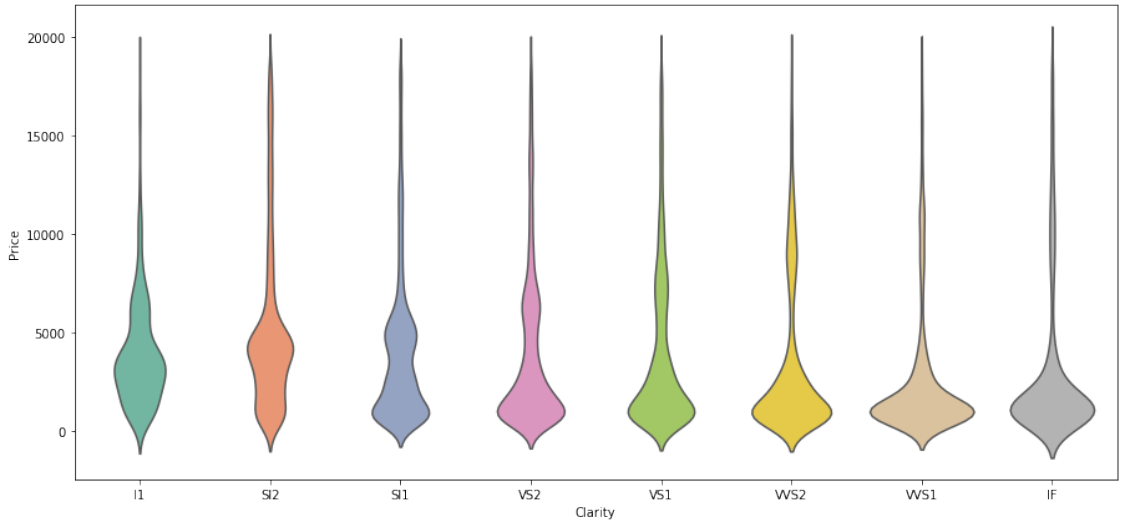
2 Clarity plots

[10]:
```
# From Worst to Best (I1= Worst) (IF= Best)
plt.figure(figsize= (15, 7))
clarity = sns.countplot(x= "clarity", data= diamonds, order=["I1", "SI2",␣
 ↪"SI1", "VS2", "VS1", "VVS2", "VVS1", "IF"], palette= "Set2")
plt.xlabel("Clarity")
plt.ylabel("Number of Observations")
for p in clarity.patches:
    height = p.get_height().round(2)
    text = str(height)
    clarity.text(p.get_x()+p.get_width()/2,height + 200,text, ha="center")

plt.show()
```



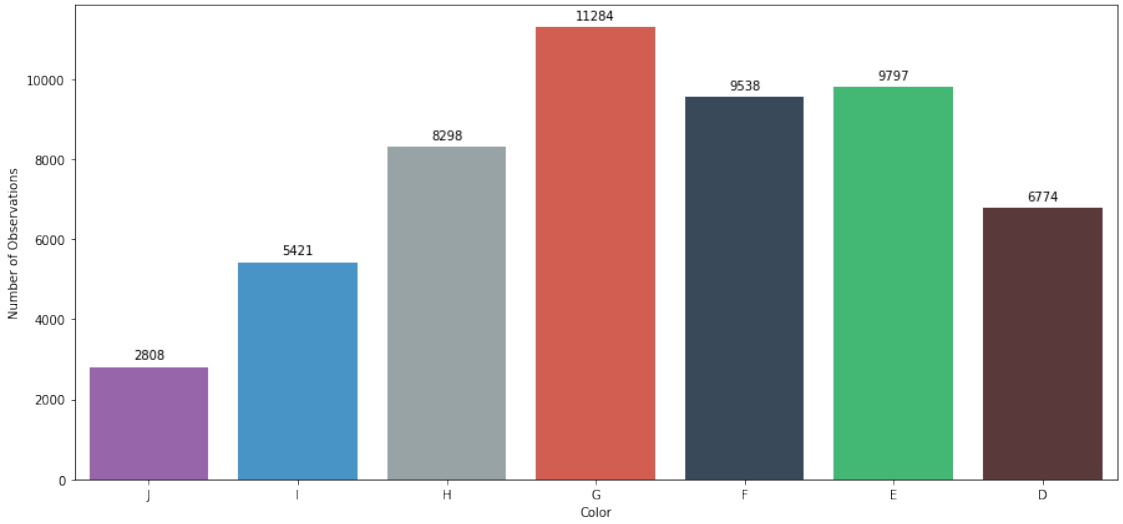
[13]:
```
plt.figure(figsize= (15, 7))
sns.violinplot(x= "clarity", y= "price", data= diamonds, inner= None,
               order=["I1", "SI2", "SI1", "VS2", "VS1", "VVS2", "VVS1", "IF"],␣
 ↪palette= "Set2")
plt.xlabel("Clarity")
plt.ylabel("Price")
plt.show()
```



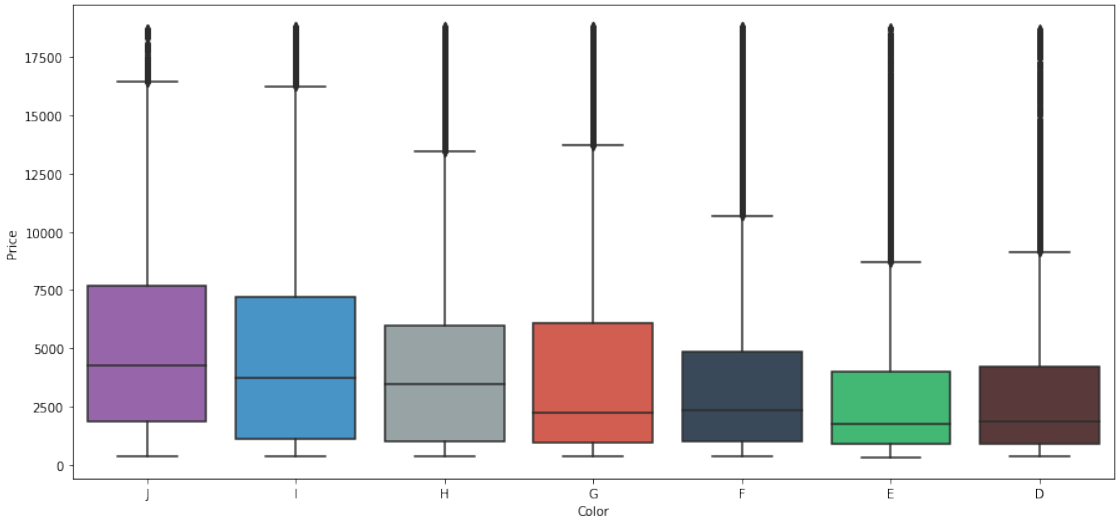
3 Color plots

[35]:
```
color_dict = ["#9b59b6", "#3498db", "#95a5a6", "#e74c3c", "#34495e", "#2ecc71",␣
 ↪"#5E3434"]
```

[36]:
```
# From Worst to Best (J= Worst) (D= Best)
plt.figure(figsize= (15, 7))
color = sns.countplot(x= "color", data= diamonds, palette= color_dict,␣
 ↪order=["J", "I", "H", "G", "F", "E", "D"])
plt.xlabel("Color")
plt.ylabel("Number of Observations")
for p in color.patches:
    height = p.get_height().round(2)
    text = str(height)
    color.text(p.get_x()+p.get_width()/2,height + 200,text, ha="center")
plt.show()
```



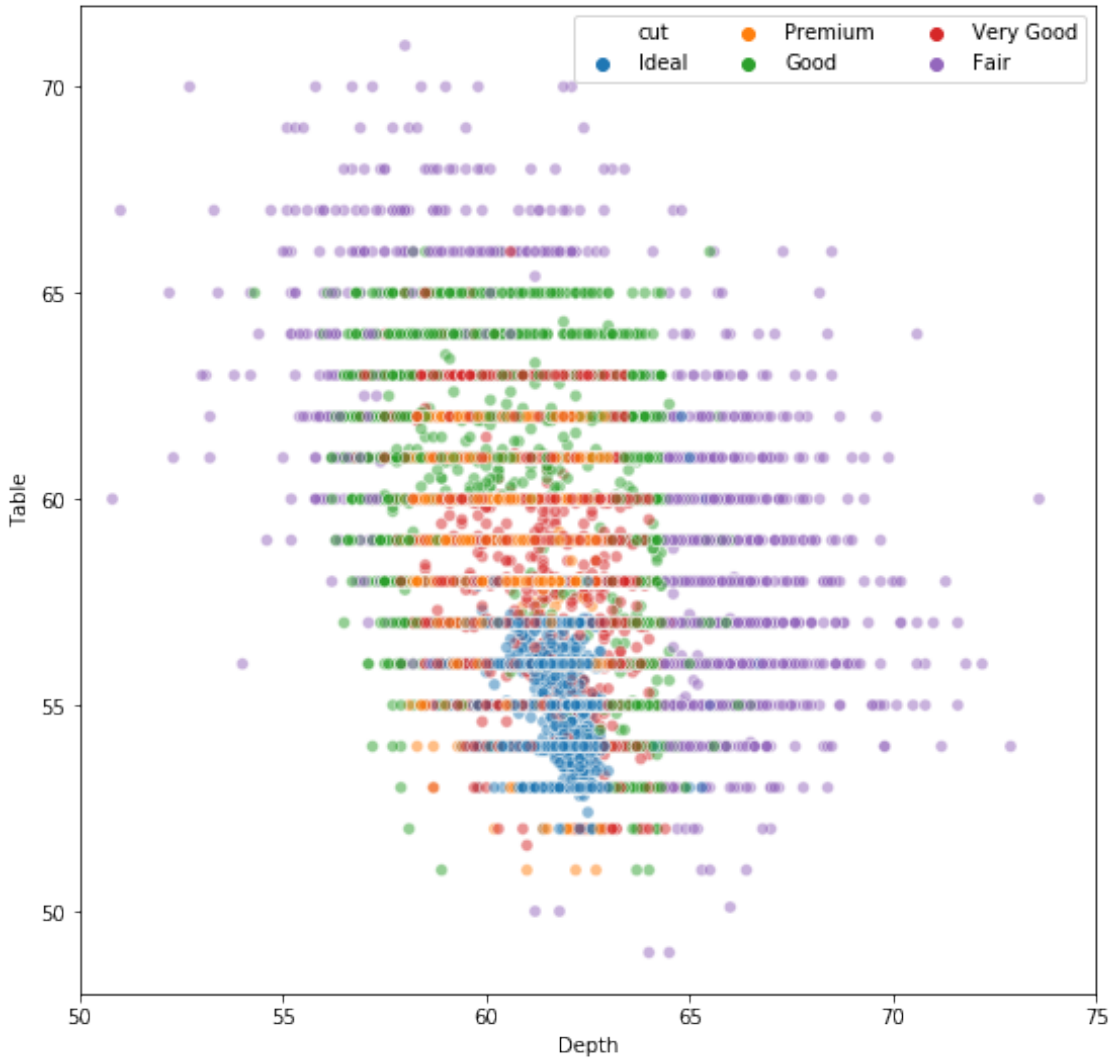
[37]:
```
plt.figure(figsize= (15, 7))
sns.boxplot(x= "color", y= "price", data= diamonds, palette= color_dict,␣
 ↪order=["J", "I", "H", "G", "F", "E", "D"])
plt.xlabel("Color")
plt.ylabel("Price")
plt.show()
```



3.1 Scatterplot of Table and Depth with different cuts

[15]:
```
plt.figure(figsize= (9, 9))
sns.scatterplot(x= "depth", y= "table", data= diamonds, y_jitter=True,␣
 ↪x_jitter= True, alpha=.5, hue= "cut")
plt.xlabel("Depth")
plt.ylabel("Table")
plt.legend(ncol= 3)
plt.xlim(50, 75)
plt.ylim(48, 72)
print("Correlation of Depth and Table of Diamonds: ", round(diamonds["table"].
 ↪corr(diamonds["depth"]),2))
plt.show()
```

```
Correlation of Depth and Table of Diamonds:  -0.3
```



3.2 3D plot of "Carat", "Volume" and "Price" with different cuts

[39]:
```
fig = px.scatter_3d(diamonds, x='carat', y='volume', z='price', color= "cut")
fig.show()
```

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