Task: Price Range vs. Online Delivery and Table Booking

3.3.1 Analyze if there is a relationship between the price range and the availability of online delivery and table booking.

In [1]:
```
import pandas as pd
data = pd.read_csv("C:\\Users\\MAHESH\Desktop\cognifyz\Dataset.csv")
data
```

Out[1]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitude	Latitude	Cuisines	.
0	6317637	Le Petit Souffle	162	Makati City	Third Floor, Century City Mall, Kalayaan Avenu...	Century City Mall, Poblacion, Makati City	Century City Mall, Poblacion, Makati City, Mak...	121.027535	14.565443	French, Japanese, Desserts	.
1	6304287	Izakaya Kikufuji	162	Makati City	Little Tokyo, 2277 Chino Roces Avenue, Legaspi...	Little Tokyo, Legaspi Village, Makati City	Little Tokyo, Legaspi Village, Makati City, Ma...	121.014101	14.553708	Japanese	.
2	6300002	Heat - Edsa Shangri-La	162	Mandaluyong City	Edsa Shangri-La, 1 Garden Way, Ortigas, Mandal...	Edsa Shangri-La, Ortigas, Mandaluyong City	Edsa Shangri-La, Ortigas, Mandaluyong City, Ma...	121.056831	14.581404	Seafood, Asian, Filipino, Indian	.
3	6318506	Ooma	162	Mandaluyong City	Third Floor, Mega Fashion Hall, SM Megamall, O...	SM Megamall, Ortigas, Mandaluyong City	SM Megamall, Ortigas, Mandaluyong City, Mandal...	121.056475	14.585318	Japanese, Sushi	.
4	6314302	Sambo Kojin	162	Mandaluyong City	Third Floor, Mega Atrium, SM Megamall, Ortigas...	SM Megamall, Ortigas, Mandaluyong City	SM Megamall, Ortigas, Mandaluyong City, Mandal...	121.057508	14.584450	Japanese, Korean	.
...	...	...	...	...	...	...	...	...	...	...	.
9546	5915730	Naml\ Gurme	208	��stanbul	Kemanke�� Karamustafa Pa��a Mahallesi, R\ht\m ...	Karak�_y	Karak�_y, ��stanbul	28.977392	41.022793	Turkish	.
9547	5908749	Ceviz A��ac\	208	��stanbul	Ko��uyolu Mahallesi, Muhittin ��st�_nda�� Cadd...	Ko��uyolu	Ko��uyolu, ��stanbul	29.041297	41.009847	World Cuisine, Patisserie, Cafe	.
9548	5915807	Huqqa	208	��stanbul	Kuru�_e��me Mahallesi, Muallim Naci Caddesi, N...	Kuru�_e��me	Kuru�_e��me, ��stanbul	29.034640	41.055817	Italian, World Cuisine	.
9549	5916112	A���k Kahve	208	��stanbul	Kuru�_e��me Mahallesi, Muallim Naci Caddesi, N...	Kuru�_e��me	Kuru�_e��me, ��stanbul	29.036019	41.057979	Restaurant Cafe	.
9550	5927402	Walter's Coffee Roastery	208	��stanbul	Cafea��a Mahallesi, Bademalt\ Sokak, No 21/B, ...	Moda	Moda, ��stanbul	29.026016	40.984776	Cafe	.

9551 rows × 21 columns

In [2]:
```
data['Price range'] = pd.to_numeric(data['Price range'], errors='coerce')
```

In [3]:
```
data['Price range']
```

Out[3]:
```
0       3
1       3
2       4
3       4
4       4
       ..
9546    3
9547    3
9548    4
9549    4
9550    2
Name: Price range, Length: 9551, dtype: int64
```

In [6]:
```
data['PriceRange'] = pd.cut(data['Price range'], bins=[0, 1, 2, 3, 4, 5], labels=['$','$$','$$$','$$$$','$$$$$'
```

In [7]:
```
data['PriceRange']
```

Out[7]:
```
0        $$$
1        $$$
2       $$$$
3       $$$$
4       $$$$
        ...
9546     $$$
9547     $$$
9548    $$$$
9549    $$$$
9550      $$
Name: PriceRange, Length: 9551, dtype: category
Categories (5, object): ['$' < '$$' < '$$$' < '$$$$' < '$$$$$']
```

In [8]:
```
data['Delivery'] = data['Has Online delivery'].map({True:1, False:0})
```

In [9]:
```
data['Delivery']
```

Out[9]:
```
0      NaN
1      NaN
2      NaN
3      NaN
4      NaN
       ..
9546   NaN
9547   NaN
9548   NaN
9549   NaN
9550   NaN
Name: Delivery, Length: 9551, dtype: float64
```

In [10]:
```
data['Booking'] = data['Has Table booking'].map({True:1, False:0})
```

In [11]:
```
data['Booking']
```

Out[11]:
```
0      NaN
1      NaN
2      NaN
3      NaN
4      NaN
       ..
9546   NaN
9547   NaN
9548   NaN
9549   NaN
9550   NaN
Name: Booking, Length: 9551, dtype: float64
```

In [15]:
```
import scipy.stats as stats
stats.f_oneway(data[data['PriceRange']=='$']['Delivery'],
 data[data['PriceRange']=='$$']['Delivery'],
 data[data['PriceRange']=='$$$']['Delivery'],
 data[data['PriceRange']=='$$$$']['Delivery'])
```

Out[15]:
```
F_onewayResult(statistic=nan, pvalue=nan)
```

In [16]:
```
import scipy.stats as stats
stats.f_oneway(data[data['PriceRange']=='$']['Booking'],
 data[data['PriceRange']=='$$']['Booking'],
 data[data['PriceRange']=='$$$']['Booking'],
 data[data['PriceRange']=='$$$$']['Booking'])
```

Out[16]:
```
F_onewayResult(statistic=nan, pvalue=nan)
```

3.3.2 Determine if higher-priced restaurants are more likely to offer these services.

In [17]:
```
price_buckets = [0,20,40,60,80,100]
data['PriceRange'] = pd.cut(data['Price range'], bins=price_buckets)
```

In [18]:
```
data['PriceRange']
```

Out[18]:
```
0       (0, 20]
1       (0, 20]
2       (0, 20]
3       (0, 20]
4       (0, 20]
         ...
9546    (0, 20]
9547    (0, 20]
9548    (0, 20]
9549    (0, 20]
9550    (0, 20]
Name: PriceRange, Length: 9551, dtype: category
Categories (5, interval[int64, right]): [(0, 20] < (20, 40] < (40, 60] < (60, 80] < (80, 100]]
```

In [19]:
```
# Create columns for delivery and booking
data['Delivery'] = data['Has Online delivery'].map({True:1, False:0})
data['Booking'] = data['Has Table booking'].map({True:1, False:0})
```

In [20]:
```
 data['Delivery']
```

Out[20]:
```
0      NaN
1      NaN
2      NaN
3      NaN
4      NaN
        ..
9546   NaN
9547   NaN
9548   NaN
9549   NaN
9550   NaN
Name: Delivery, Length: 9551, dtype: float64
```

In [21]:
```
data['Booking']
```

Out[21]:
```
0      NaN
1      NaN
2      NaN
3      NaN
4      NaN
        ..
9546   NaN
9547   NaN
9548   NaN
9549   NaN
9550   NaN
Name: Booking, Length: 9551, dtype: float64
```

In [22]:
```
means = data.groupby('PriceRange')[['Delivery','Booking']].mean()
```

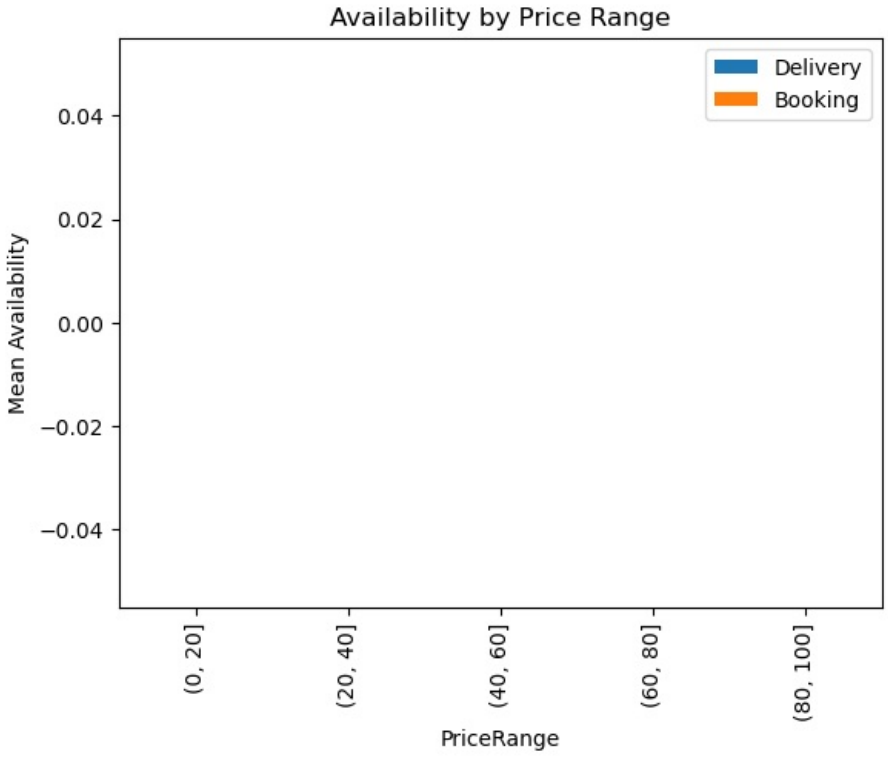
In [23]:
```
means
```

Out[23]:

PriceRange	Delivery	Booking
(0, 20]	NaN	NaN
(20, 40]	NaN	NaN
(40, 60]	NaN	NaN
(60, 80]	NaN	NaN
(80, 100]	NaN	NaN

In [24]:
```
import matplotlib.pyplot as plt
means.plot(kind='bar')
plt.title('Availability by Price Range')
plt.ylabel('Mean Availability')
```

Out[24]:
```
Text(0, 0.5, 'Mean Availability')
```



In [25]:
```
from scipy.stats import f_oneway
```

In [26]:
```
f_oneway(data[data['PriceRange']==(0, 20)]['Delivery'],
 data[data['PriceRange']==(20, 40)]['Delivery'],
 data[data['PriceRange']==(40, 60)]['Delivery'])
```

```
C:\Users\MAHESH\anaconda3\Lib\site-packages\scipy\stats\_stats_py.py:4133: DegenerateDataWarning: at least one
input has length 0
  warnings.warn(stats.DegenerateDataWarning('at least one input '
```

Out[26]:
```
F_onewayResult(statistic=nan, pvalue=nan)
```

In [27]:
```
f_oneway(data[data['PriceRange']==(0, 20)]['Booking'],
 data[data['PriceRange']==(20, 40)]['Booking'],
 data[data['PriceRange']==(40, 60)]['Booking'])
```

Out[27]:
```
F_onewayResult(statistic=nan, pvalue=nan)
```

In [ ]:

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