In [1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.linear_model import LogisticRegression
from sklearn.linear_model import LinearRegression
from sklearn.model_selection import train_test_split
from sklearn.metrics import classification_report
from sklearn.metrics import confusion_matrix
from sklearn.metrics import r2_score
```

In [5]:
```
zomato_orgnl=pd.read_csv("F:\zomato.csv")
zomato_orgnl.head()
```

Out[5]:

ok_table	rate	votes	phone	location	rest_type	dish_liked	cuisines	approx_cost two peo
Yes	4.1/5	775	080 42297555\r\n+91 9743772233	Banashankari	Casual Dining	Pasta, Lunch Buffet, Masala Papad, Paneer Laja...	North Indian, Mughlai, Chinese	
No	4.1/5	787	080 41714161	Banashankari	Casual Dining	Momos, Lunch Buffet, Chocolate Nirvana, Thai G...	Chinese, North Indian, Thai	
No	3.8/5	918	+91 9663487993	Banashankari	Cafe, Casual Dining	Churros, Cannelloni, Minestrone Soup, Hot Choc...	Cafe, Mexican, Italian	
No	3.7/5	88	+91 9620009302	Banashankari	Quick Bites	Masala Dosa	South Indian, North Indian	
No	3.8/5	166	+91 8026612447\r\n+91 9901210005	Basavanagudi	Casual Dining	Panipuri, Gol Gappe	North Indian, Rajasthani	

In [31]:
```
zomato=zomato_orgnl.drop(['url','dish_liked','phone'],axis=1)
```

In [7]:
```
zomato.duplicated().sum()
zomato.drop_duplicates(inplace=True)
```

In [8]:
```
zomato.isnull().sum()
zomato.dropna(how='any',inplace=True)
zomato.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 43499 entries, 0 to 51716
Data columns (total 14 columns):
address                         43499 non-null object
name                            43499 non-null object
online_order                    43499 non-null object
book_table                      43499 non-null object
rate                            43499 non-null object
votes                           43499 non-null int64
location                        43499 non-null object
rest_type                       43499 non-null object
cuisines                        43499 non-null object
approx_cost(for two people)     43499 non-null object
reviews_list                    43499 non-null object
menu_item                       43499 non-null object
listed_in(type)                 43499 non-null object
listed_in(city)                 43499 non-null object
dtypes: int64(1), object(13)
memory usage: 5.0+ MB
```

In [9]:
```
zomato.columns
zomato = zomato.rename(columns={'approx_cost(for two people)':'cost','listed_in(
                                'listed_in(city)':'city'})
zomato.columns
```

Out[9]:
```
Index(['address', 'name', 'online_order', 'book_table', 'rate', 'votes',
       'location', 'rest_type', 'cuisines', 'cost', 'reviews_list',
       'menu_item', 'type', 'city'],
      dtype='object')
```

In [10]:
```
zomato['cost'] = zomato['cost'].astype(str)
zomato['cost'] = zomato['cost'].apply(lambda x: x.replace(',','.'))
zomato['cost'] = zomato['cost'].astype(float)
zomato.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 43499 entries, 0 to 51716
Data columns (total 14 columns):
address         43499 non-null object
name            43499 non-null object
online_order    43499 non-null object
book_table      43499 non-null object
rate            43499 non-null object
votes           43499 non-null int64
location        43499 non-null object
rest_type       43499 non-null object
cuisines        43499 non-null object
cost            43499 non-null float64
reviews_list    43499 non-null object
menu_item       43499 non-null object
type            43499 non-null object
city            43499 non-null object
dtypes: float64(1), int64(1), object(12)
memory usage: 5.0+ MB
```

In [11]:
```
zomato['rate'].unique()
zomato = zomato.loc[zomato.rate !='NEW']
zomato = zomato.loc[zomato.rate !='-'].reset_index(drop=True)
remove_slash = lambda x: x.replace('/5', '') if type(x) == np.str else x
zomato.rate = zomato.rate.apply(remove_slash).str.strip().astype('float')
zomato['rate'].head()
```

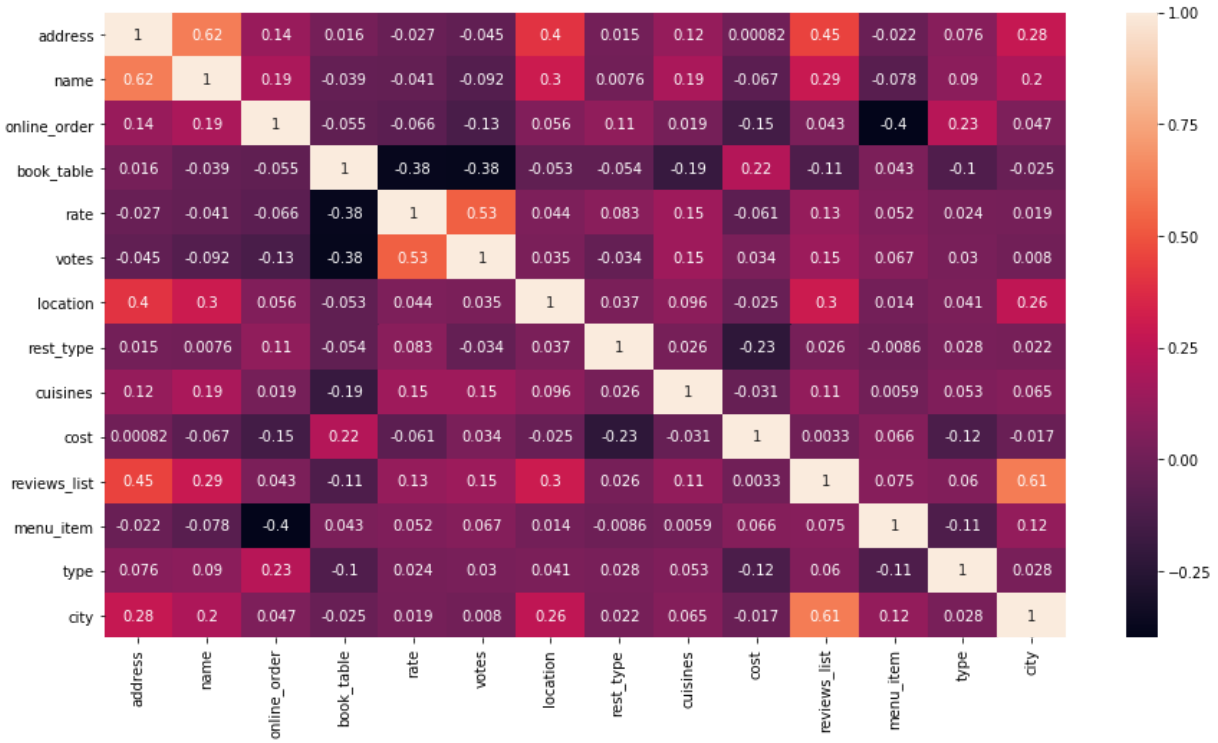
Out[11]:
```
0    4.1
1    4.1
2    3.8
3    3.7
4    3.8
Name: rate, dtype: float64
```

In [12]:
```
def Encode(zomato):
    for column in zomato.columns[~zomato.columns.isin(['rate', 'cost', 'votes'])
        zomato[column] = zomato[column].factorize()[0]
    return zomato

zomato_en = Encode(zomato.copy())
```

In [13]:
```
corr = zomato_en.corr(method='kendall')
plt.figure(figsize=(15,8))
sns.heatmap(corr, annot=True)
zomato_en.columns
```

Out[13]:
```
Index(['address', 'name', 'online_order', 'book_table', 'rate', 'votes',
       'location', 'rest_type', 'cuisines', 'cost', 'reviews_list',
       'menu_item', 'type', 'city'],
      dtype='object')
```



In [14]:
```
x = zomato_en.iloc[:,[2,3,5,6,7,8,9,11]]
y = zomato_en['rate']
#Getting Test and Training Set
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=.1,random_state=353)
x_train.head()
y_train.head()
```

Out[14]:
```
16950    3.9
767      3.7
6750     4.0
9471     3.8
25162    3.7
Name: rate, dtype: float64
```

In [15]:
```
reg=LinearRegression()
reg.fit(x_train,y_train)
y_pred=reg.predict(x_test)
from sklearn.metrics import r2_score
r2_score(y_test,y_pred)
```

Out[15]: 0.2736233722103867

In [16]:
```
from sklearn.tree import DecisionTreeRegressor
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=.1,random_state=105
DTree=DecisionTreeRegressor(min_samples_leaf=.0001)
DTree.fit(x_train,y_train)
y_predict=DTree.predict(x_test)
from sklearn.metrics import r2_score
r2_score(y_test,y_predict)
```

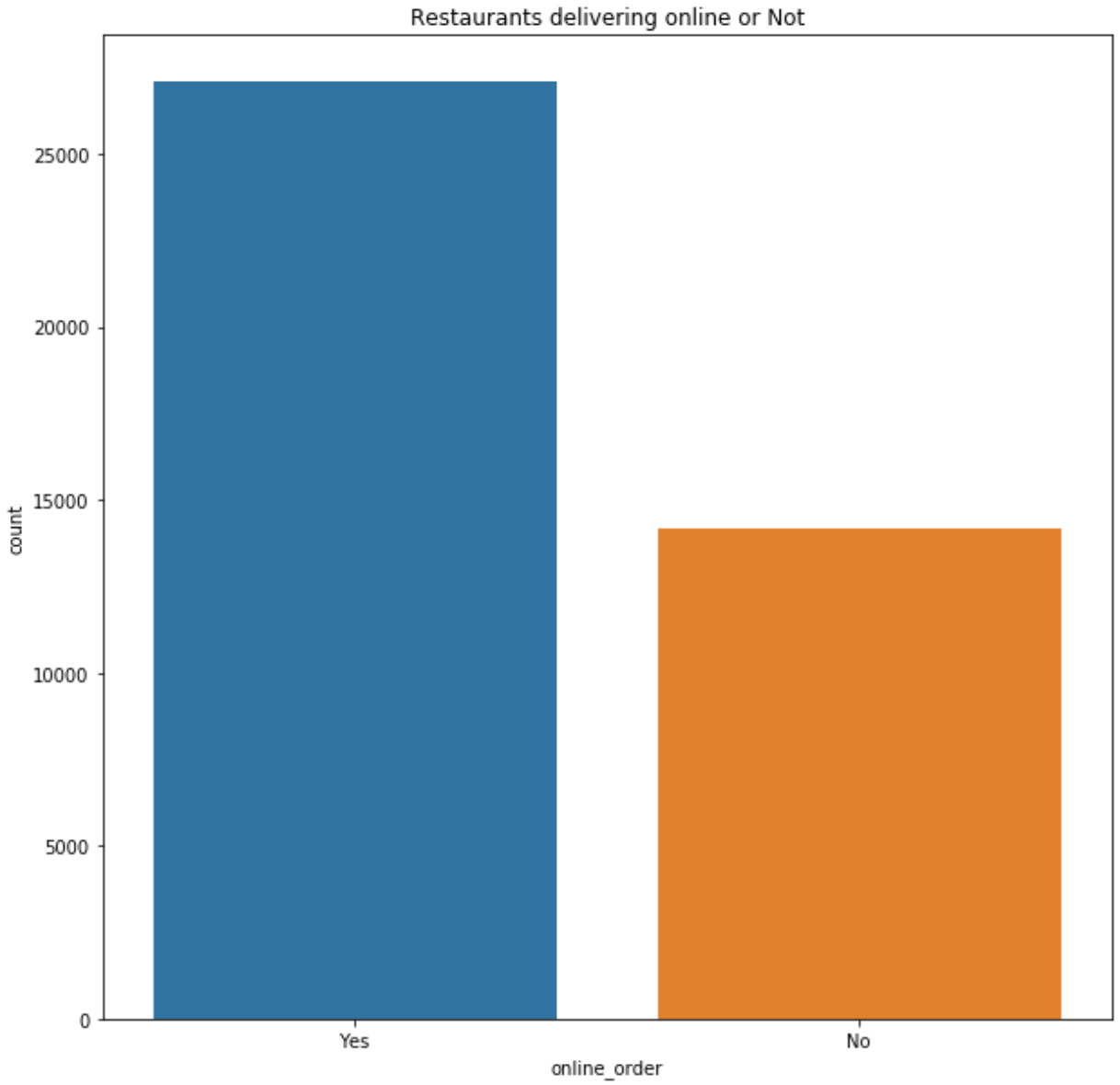
Out[16]: 0.8538216118810479

In [17]:
```
from sklearn.ensemble import RandomForestRegressor
RForest=RandomForestRegressor(n_estimators=500,random_state=329,min_samples_leaf
RForest.fit(x_train,y_train)
y_predict=RForest.predict(x_test)
from sklearn.metrics import r2_score
r2_score(y_test,y_predict)
```

Out[17]: 0.8773808619238765

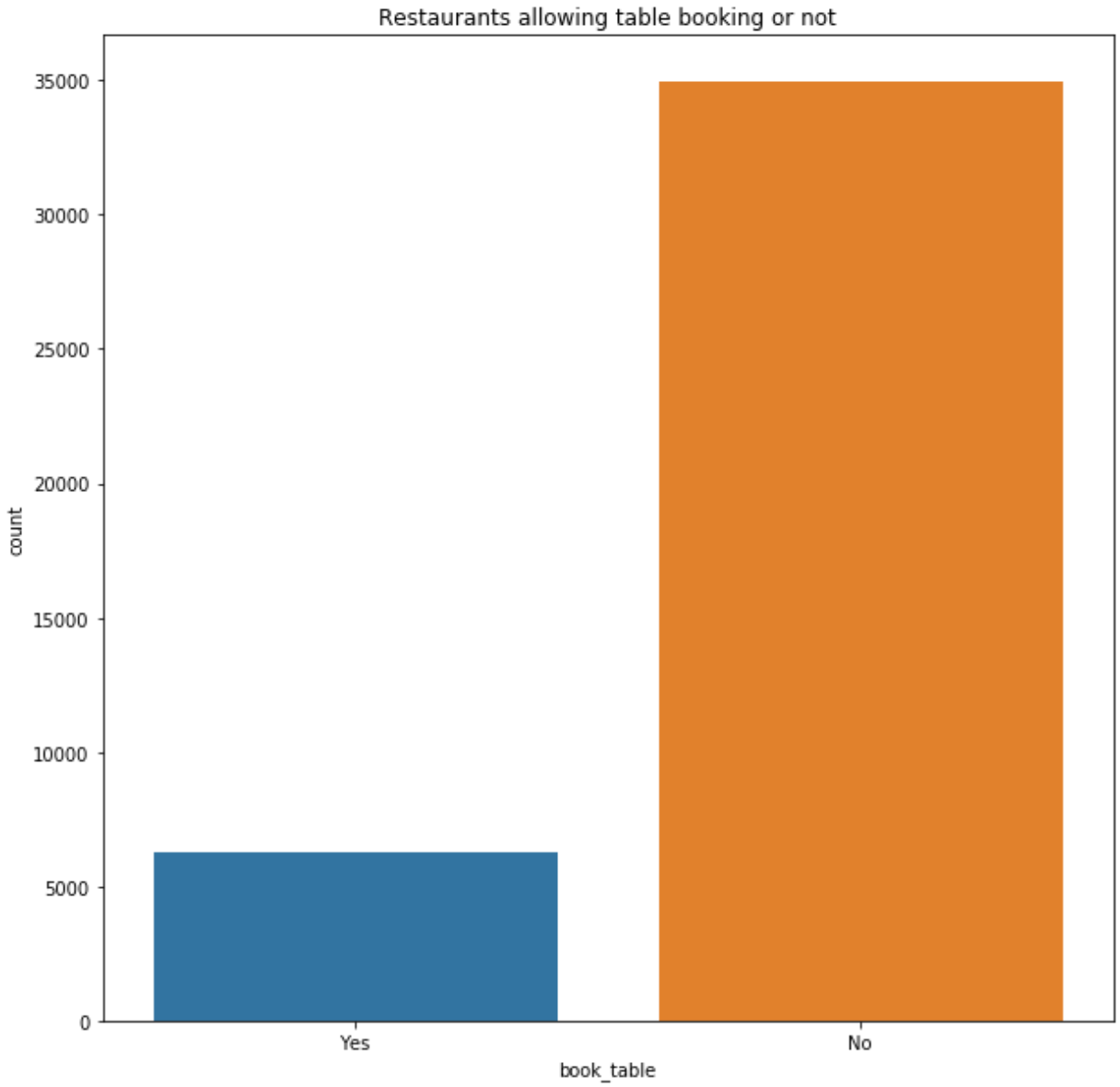
In [18]:
```
sns.countplot(zomato['online_order'])
fig = plt.gcf()
fig.set_size_inches(10,10)
plt.title('Restaurants delivering online or Not')
```

Out[18]: Text(0.5, 1.0, 'Restaurants delivering online or Not')

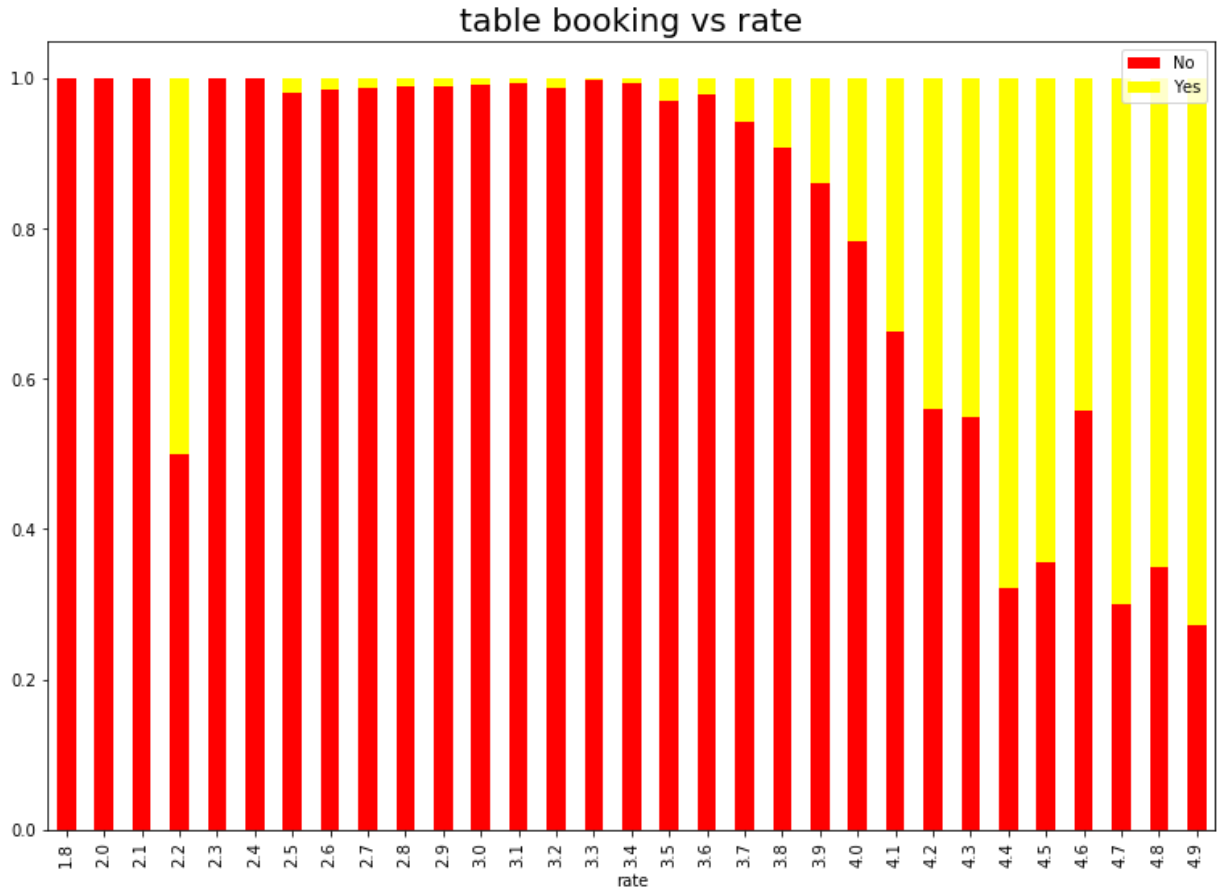


In [19]:
```
sns.countplot(zomato['book_table'])
fig = plt.gcf()
fig.set_size_inches(10,10)
plt.title('Restaurants allowing table booking or not')
```

Out[19]: Text(0.5, 1.0, 'Restaurants allowing table booking or not')

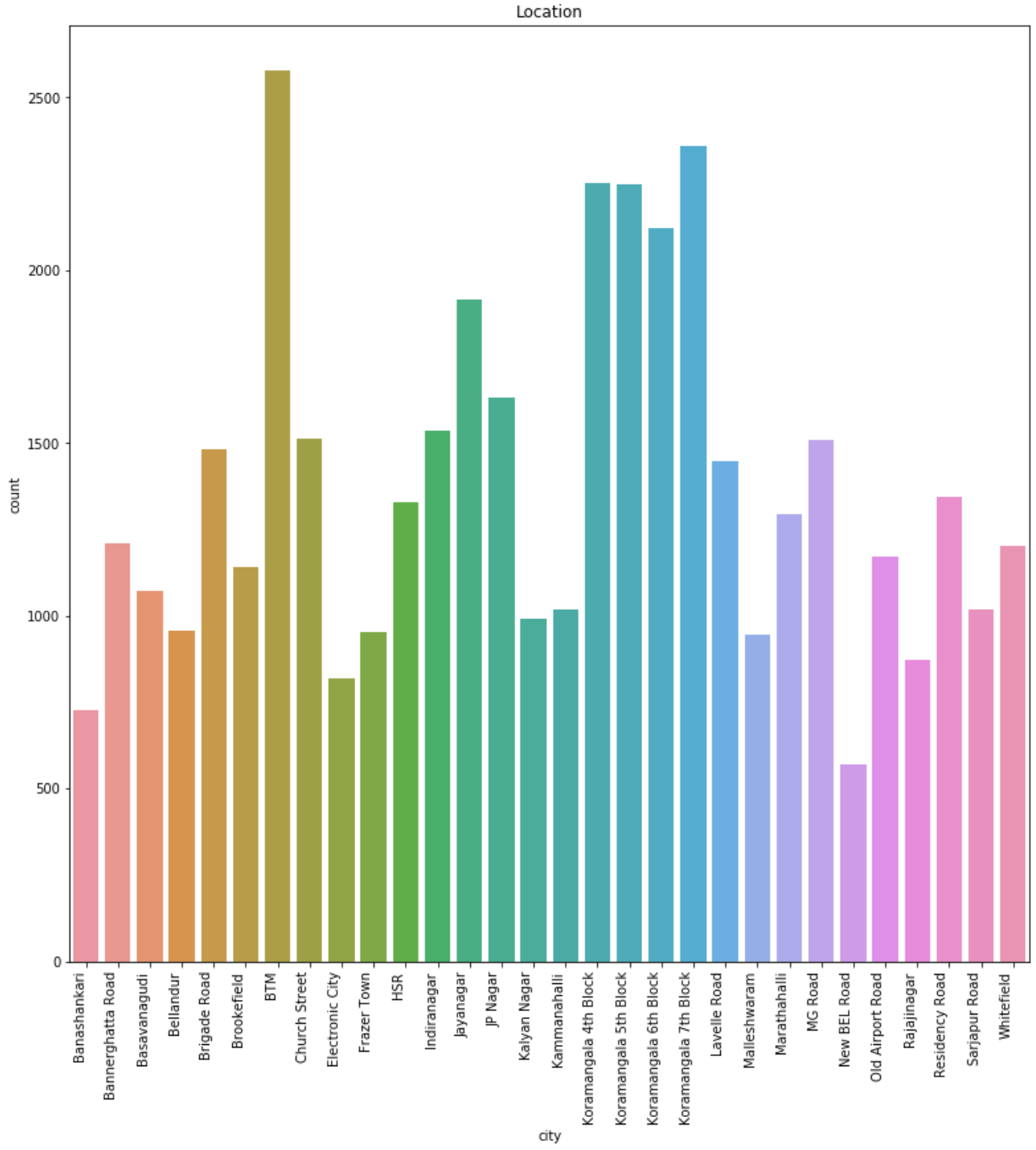


In [20]:
```
plt.rcParams['figure.figsize'] = (13, 9)
Y = pd.crosstab(zomato['rate'], zomato['book_table'])
Y.div(Y.sum(1).astype(float), axis = 0).plot(kind = 'bar', stacked = True,color=
plt.title('table booking vs rate', fontweight = 30, fontsize = 20)
plt.legend(loc="upper right")
plt.show()
```

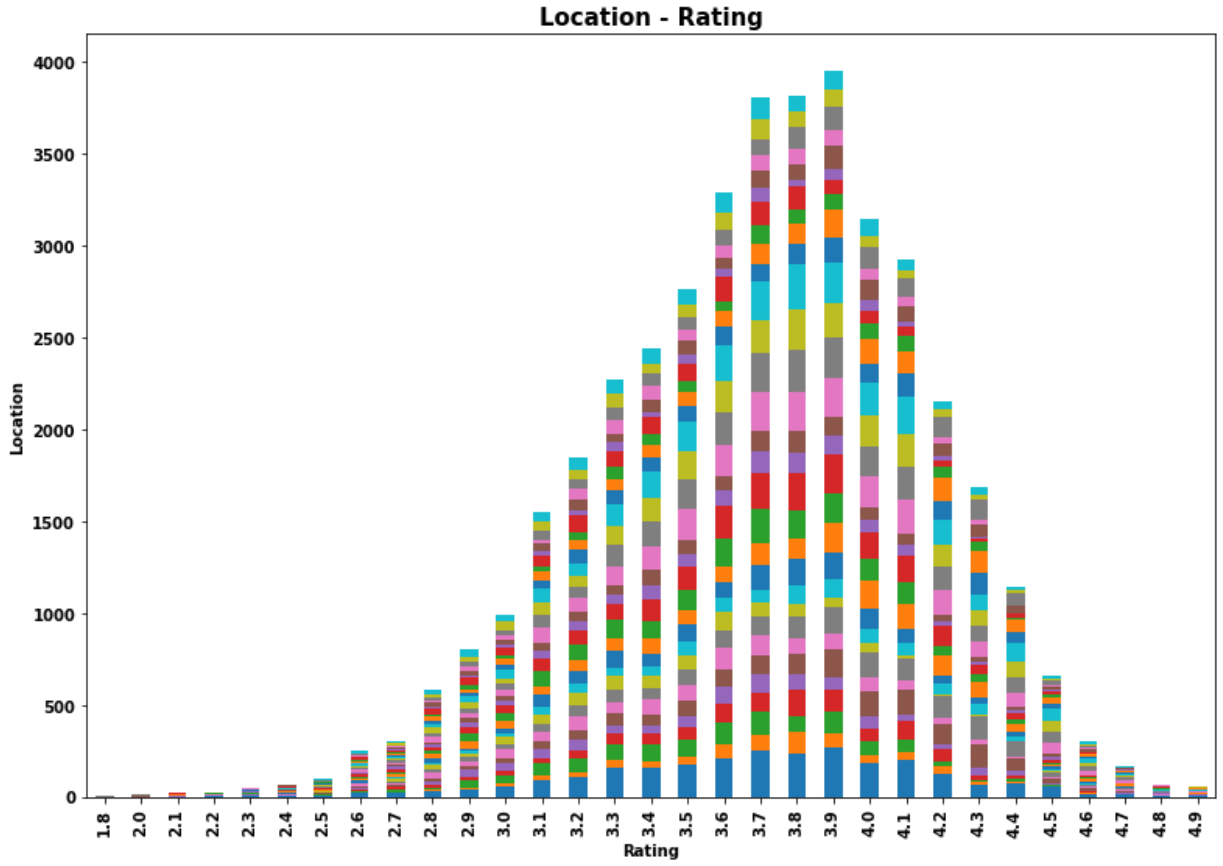


In [21]:
```
sns.countplot(zomato['city'])
sns.countplot(zomato['city']).set_xticklabels(sns.countplot(zomato['city']).get_x
fig = plt.gcf()
fig.set_size_inches(13,13)
plt.title('Location')
```

Out[21]: Text(0.5, 1.0, 'Location')

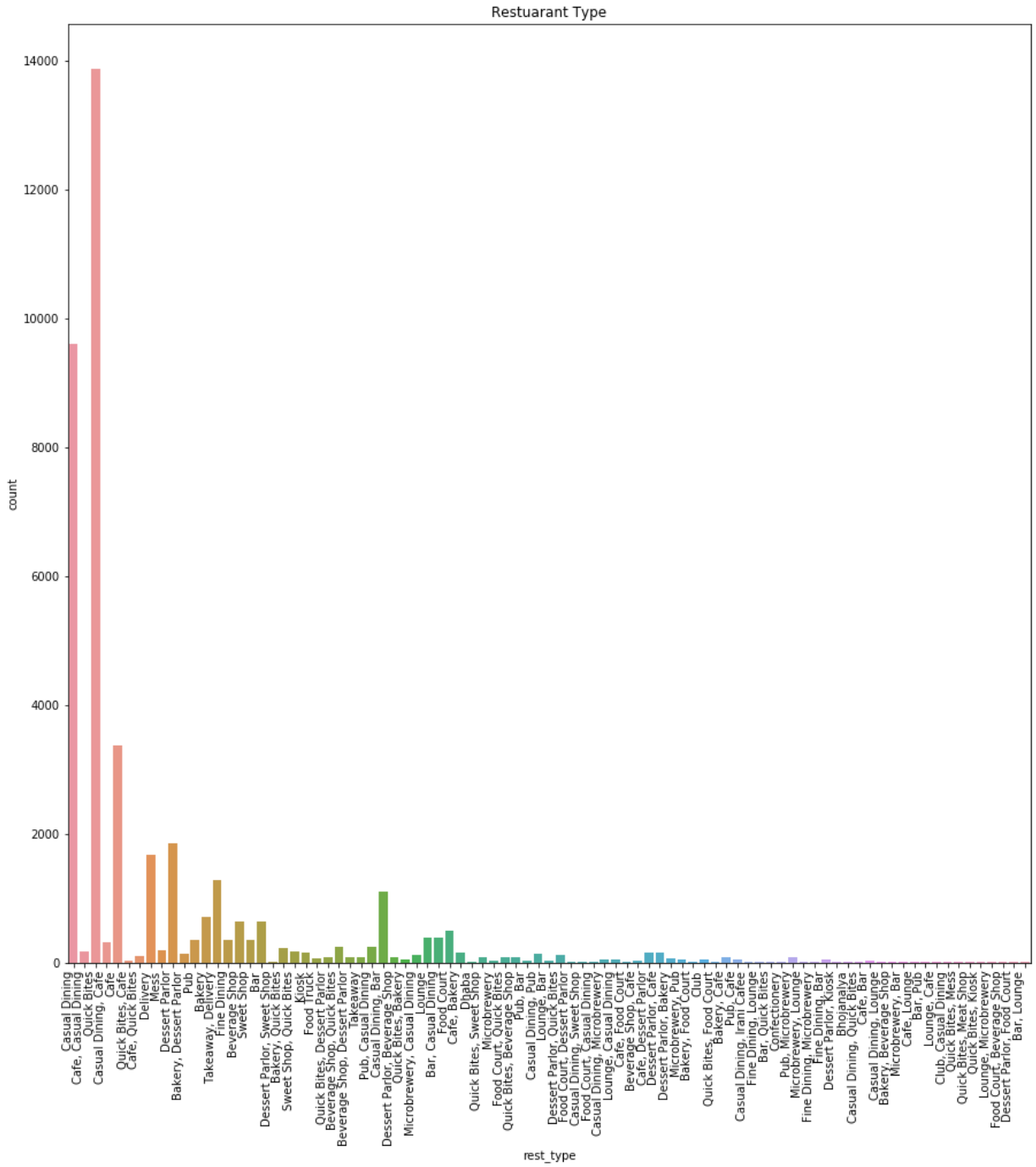


In [22]:
```
loc_plt=pd.crosstab(zomato['rate'],zomato['city'])
loc_plt.plot(kind='bar',stacked=True);
plt.title('Location - Rating',fontsize=15,fontweight='bold')
plt.ylabel('Location',fontsize=10,fontweight='bold')
plt.xlabel('Rating',fontsize=10,fontweight='bold')
plt.xticks(fontsize=10,fontweight='bold')
plt.yticks(fontsize=10,fontweight='bold');
plt.legend().remove();
```

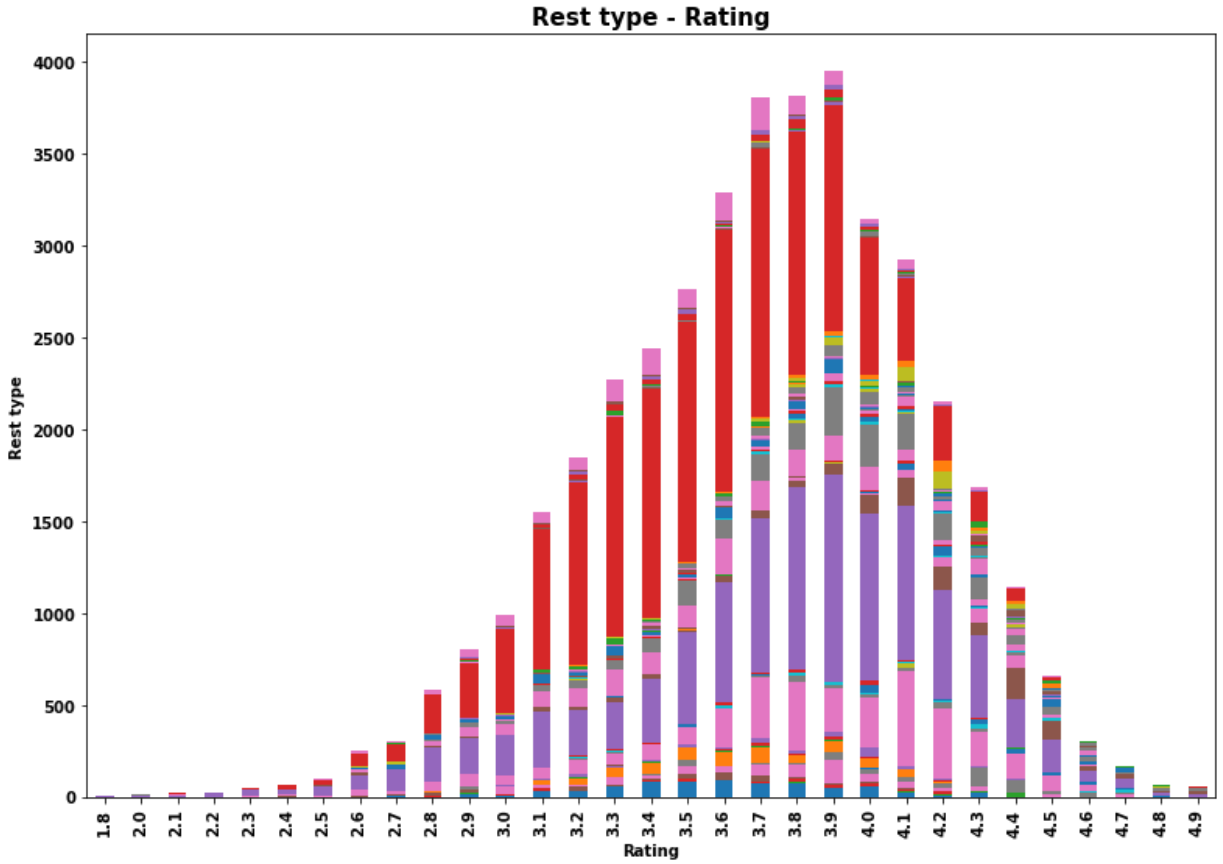


In [23]:
```
sns.countplot(zomato['rest_type'])
sns.countplot(zomato['rest_type']).set_xticklabels(sns.countplot(zomato['rest_ty
fig = plt.gcf()
fig.set_size_inches(15,15)
plt.title('Restuarant Type')
```

Out[23]: Text(0.5, 1.0, 'Restuarant Type')

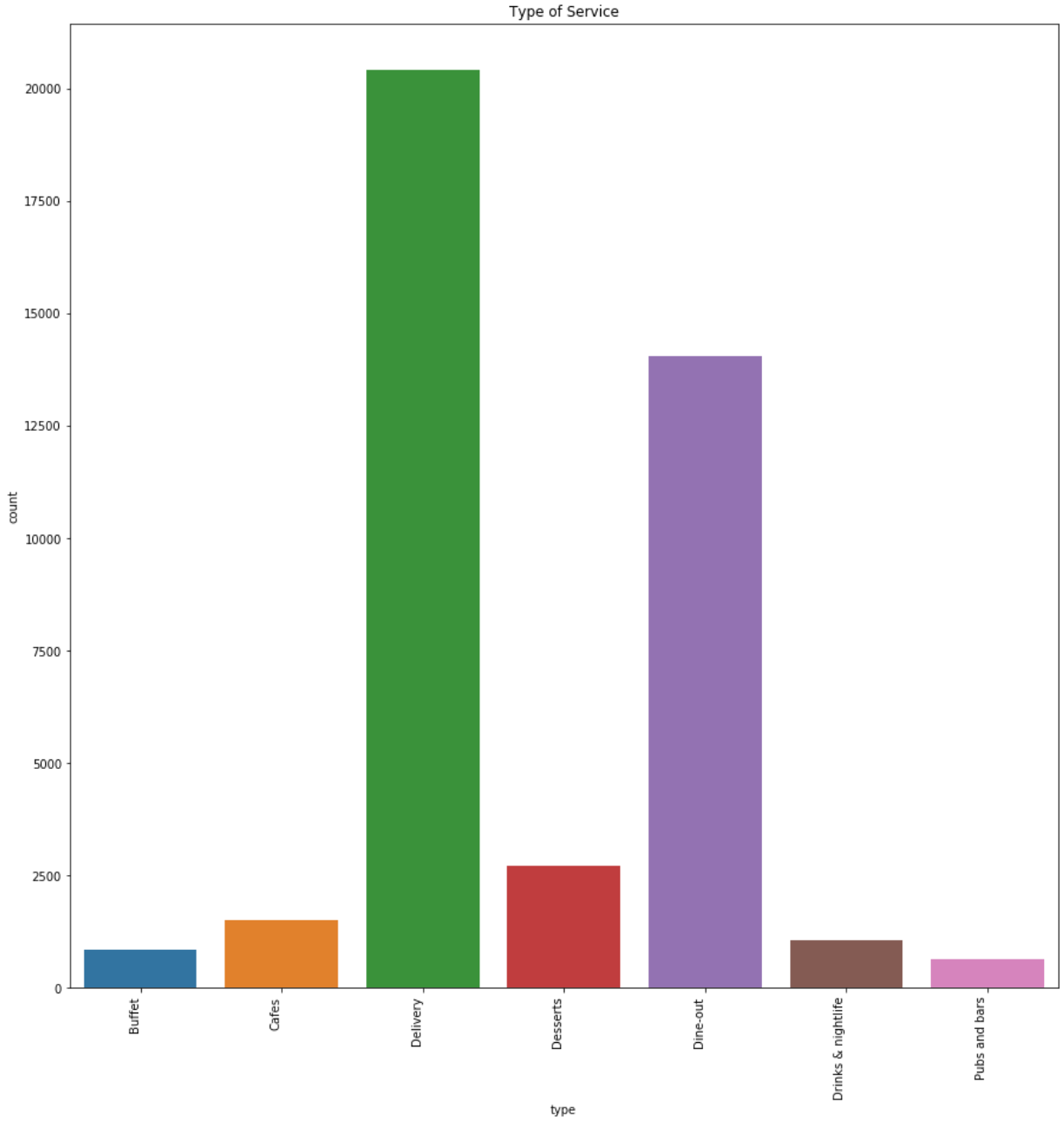


In [24]:
```
loc_plt=pd.crosstab(zomato['rate'],zomato['rest_type'])
loc_plt.plot(kind='bar',stacked=True);
plt.title('Rest type - Rating',fontsize=15,fontweight='bold')
plt.ylabel('Rest type',fontsize=10,fontweight='bold')
plt.xlabel('Rating',fontsize=10,fontweight='bold')
plt.xticks(fontsize=10,fontweight='bold')
plt.yticks(fontsize=10,fontweight='bold');
plt.legend().remove();
```

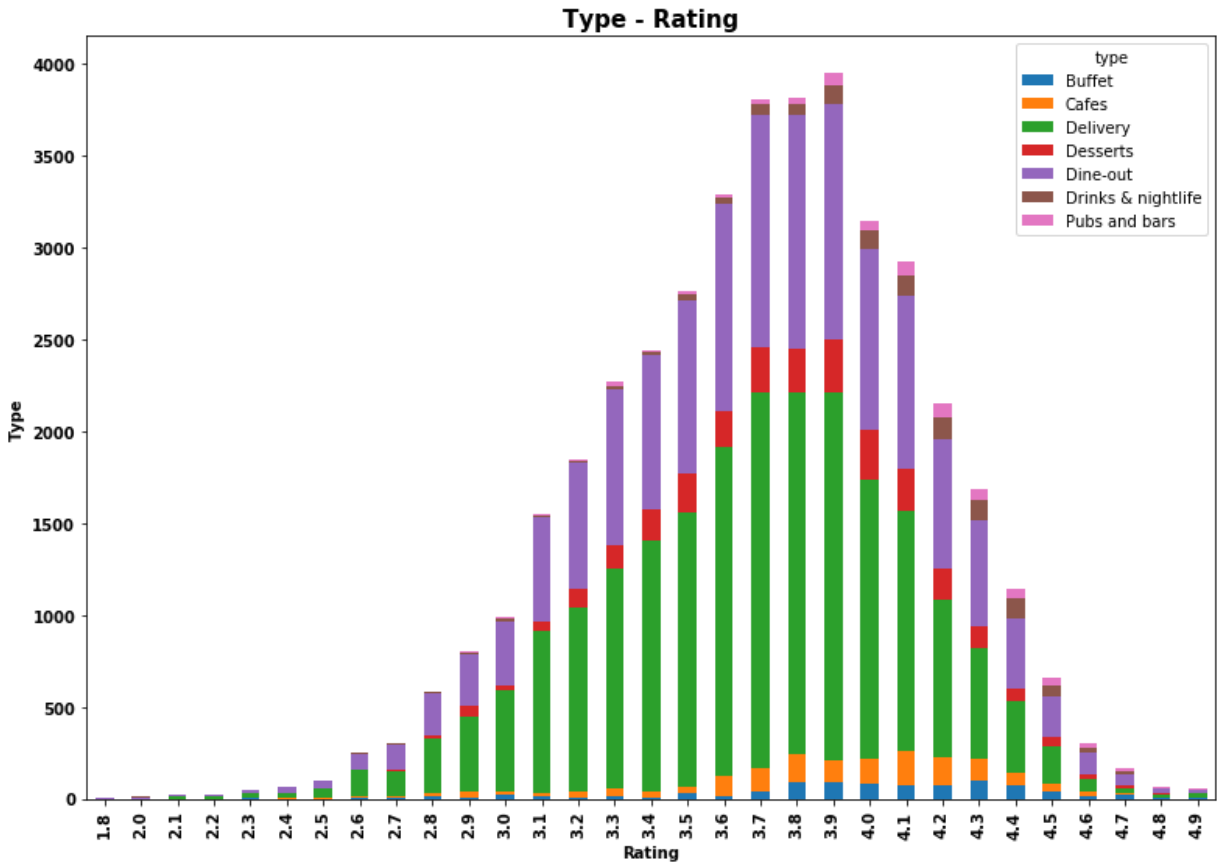


In [25]:
```
sns.countplot(zomato['type'])
sns.countplot(zomato['type']).set_xticklabels(sns.countplot(zomato['type']).get_x
fig = plt.gcf()
fig.set_size_inches(15,15)
plt.title('Type of Service')
```

Out[25]:
```
Text(0.5, 1.0, 'Type of Service')
```

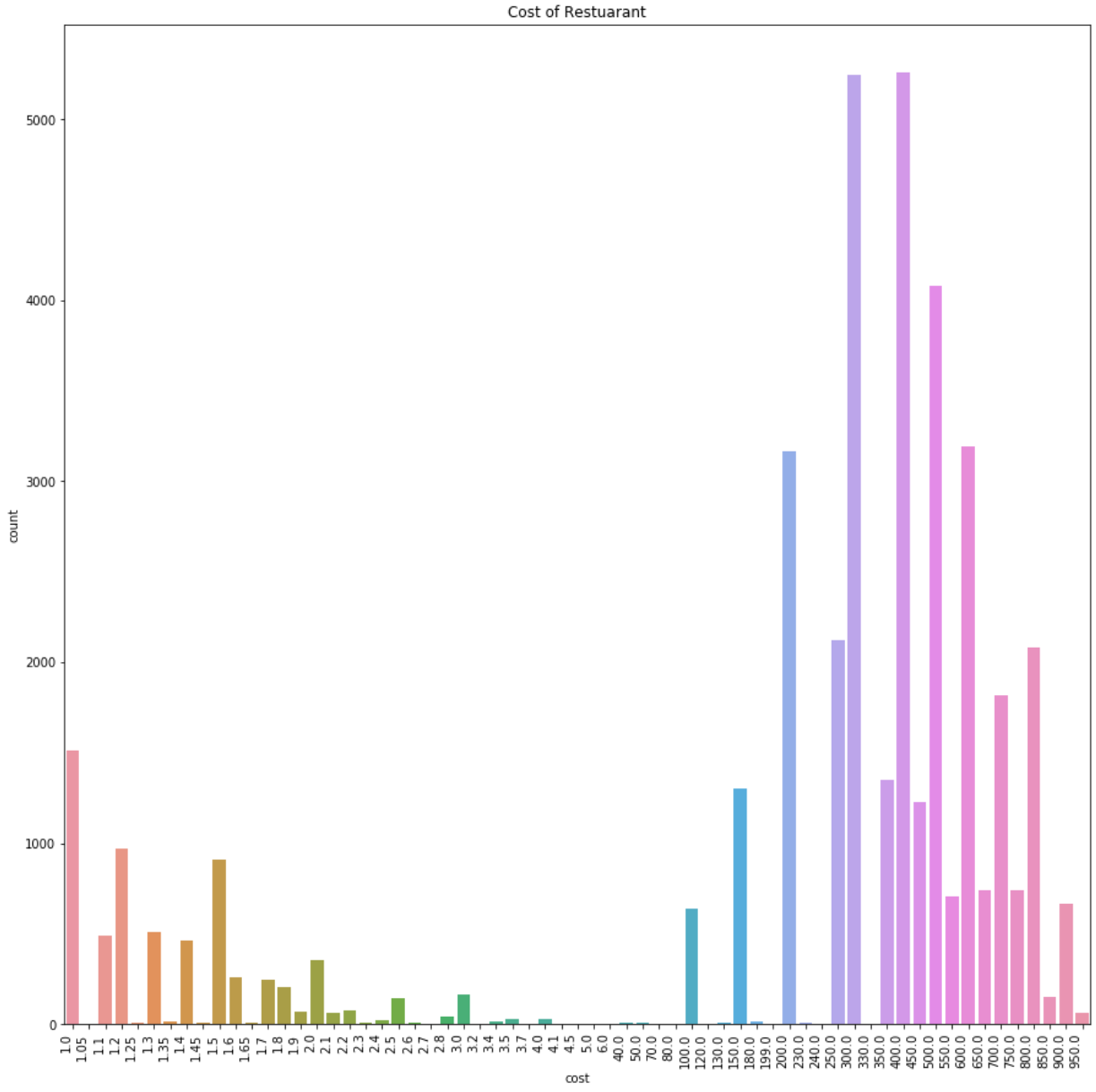


In [26]:
```
type_plt=pd.crosstab(zomato['rate'],zomato['type'])
type_plt.plot(kind='bar',stacked=True);
plt.title('Type - Rating',fontsize=15,fontweight='bold')
plt.ylabel('Type',fontsize=10,fontweight='bold')
plt.xlabel('Rating',fontsize=10,fontweight='bold')
plt.xticks(fontsize=10,fontweight='bold')
plt.yticks(fontsize=10,fontweight='bold');
```



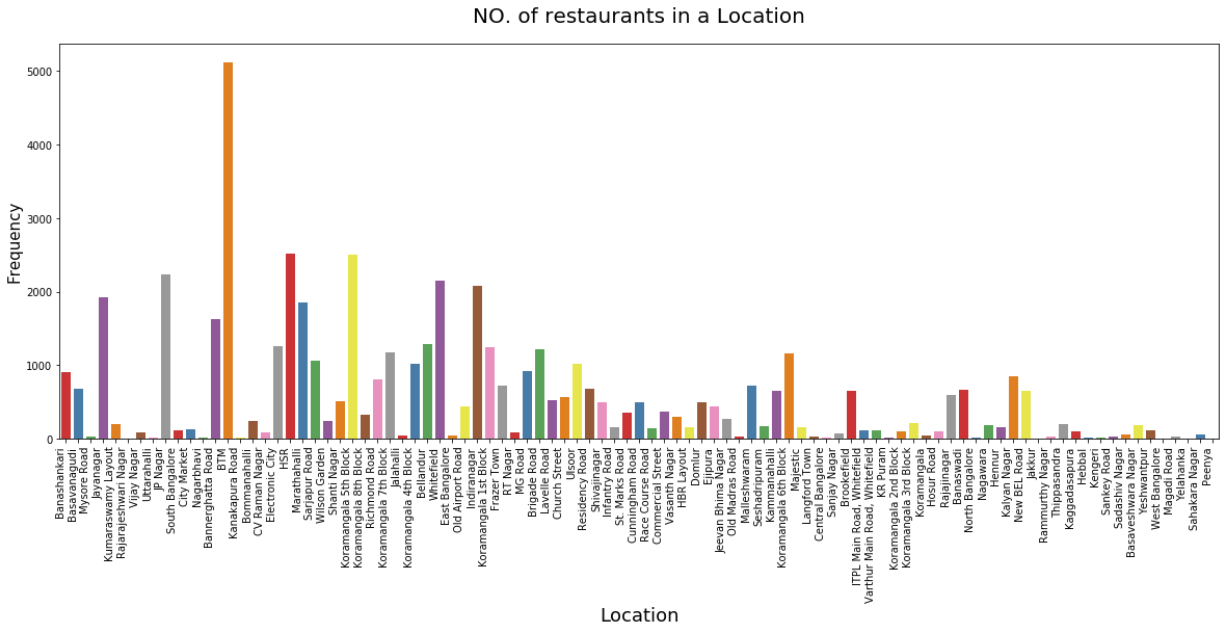
In [27]:
```
sns.countplot(zomato['cost'])
sns.countplot(zomato['cost']).set_xticklabels(sns.countplot(zomato['cost']).get_x
fig = plt.gcf()
fig.set_size_inches(15,15)
plt.title('Cost of Restuarant')
```

Out[27]:
```
Text(0.5, 1.0, 'Cost of Restuarant')
```



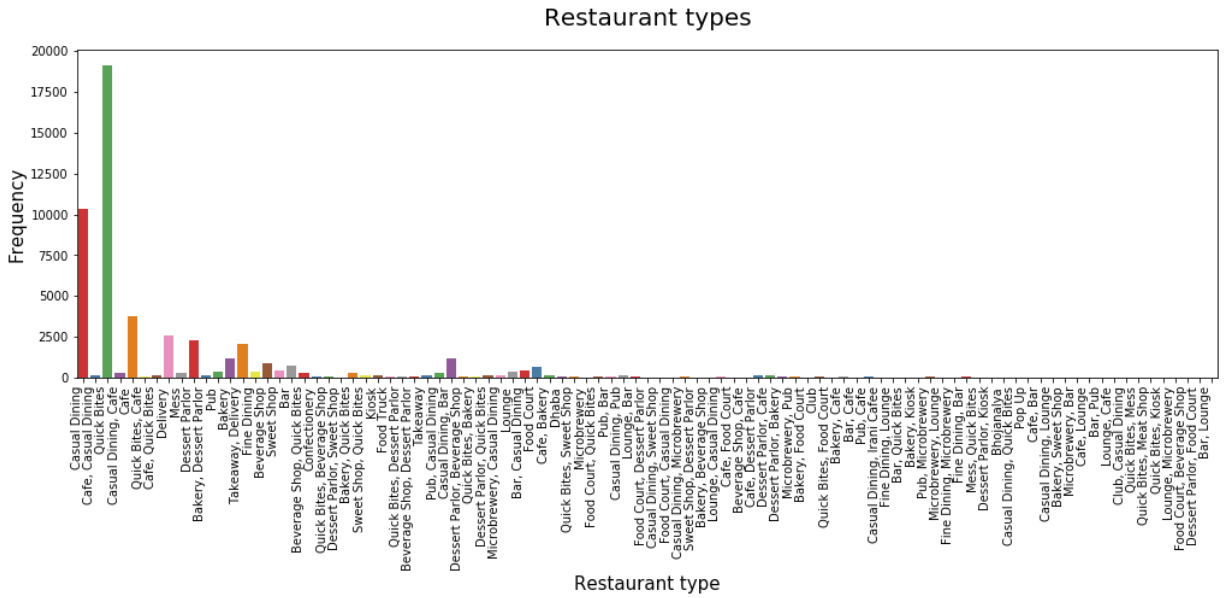
In [28]:
```
fig = plt.figure(figsize=(20,7))
loc = sns.countplot(x="location",data=zomato_orgnl, palette = "Set1")
loc.set_xticklabels(loc.get_xticklabels(), rotation=90, ha="right")
plt.ylabel("Frequency",size=15)
plt.xlabel("Location",size=18)
loc
plt.title('NO. of restaurants in a Location',size = 20,pad=20)
```

Out[28]:
```
Text(0.5, 1.0, 'NO. of restaurants in a Location')
```



In [29]:
```
#Restaurant type
fig = plt.figure(figsize=(17,5))
rest = sns.countplot(x="rest_type",data=zomato_orgnl, palette = "Set1")
rest.set_xticklabels(rest.get_xticklabels(), rotation=90, ha="right")
plt.ylabel("Frequency",size=15)
plt.xlabel("Restaurant type",size=15)
rest
plt.title('Restaurant types',fontsize = 20 ,pad=20)
```

Out[29]: Text(0.5, 1.0, 'Restaurant types')



In [30]:
```
plt.figure(figsize=(15,7))
chains=zomato_orgnl['name'].value_counts()[:20]
sns.barplot(x=chains,y=chains.index,palette='Set1')
plt.title("Most famous restaurant chains in Bangaluru",size=20,pad=20)
plt.xlabel("Number of outlets",size=15)
```

Out[30]: Text(0.5, 0, 'Number of outlets')