Zomato end-end EDA

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In [1]:
```
# Zomato Restaurant Reviews – End-to-End EDA Notebook

# 1. Introduction
# In this notebook, we will perform an end-to-end Exploratory Data A
# The objective is to clean the data, analyze key trends, visualize

import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from pathlib import Path

# Display settings
pd.set_option('display.max_columns', None)
pd.set_option('display.max_rows', 100)
```

```
/Users/shivalimuthukumar/anaconda3/lib/python3.11/site-packages/pa
ndas/core/arrays/masked.py:60: UserWarning: Pandas requires versio
n '1.3.6' or newer of 'bottleneck' (version '1.3.5' currently inst
alled).
  from pandas.core import (
```

In [8]:
```
# Load Reviews Dataset
reviews_path = Path("/Users/shivalimuthukumar/Desktop/Zomato Restau
reviews_df = pd.read_csv(reviews_path)
reviews_df.head()
```

Out[8]:

	Restaurant	Reviewer	Review	Rating	Metadata	Time	Pictures
0	Beyond Flavours	Rusha Chakraborty	The ambience was good, food was quite good . h...	5	1 Review , 2 Followers	5/25/2019 15:54	0
1	Beyond Flavours	Anusha Tirumalaneedi	Ambience is too good for a pleasant evening. S...	5	3 Reviews , 2 Followers	5/25/2019 14:20	0
2	Beyond Flavours	Ashok Shekhawat	A must try.. great food great ambience. Thnx f...	5	2 Reviews , 3 Followers	5/24/2019 22:54	0
3	Beyond Flavours	Swapnil Sarkar	Soumen das and Arun was a great guy. Only beca...	5	1 Review , 1 Follower	5/24/2019 22:11	0
4	Beyond Flavours	Dileep	Food is good.we ordered Kodi drumsticks and ba...	5	3 Reviews , 2 Followers	5/24/2019 21:37	0

In [9]:
```
# Load Metadata Dataset
meta_path = Path("/Users/shivalimuthukumar/Desktop/Zomato Restauran
metadata_df = pd.read_csv(meta_path)
metadata_df.head()
```

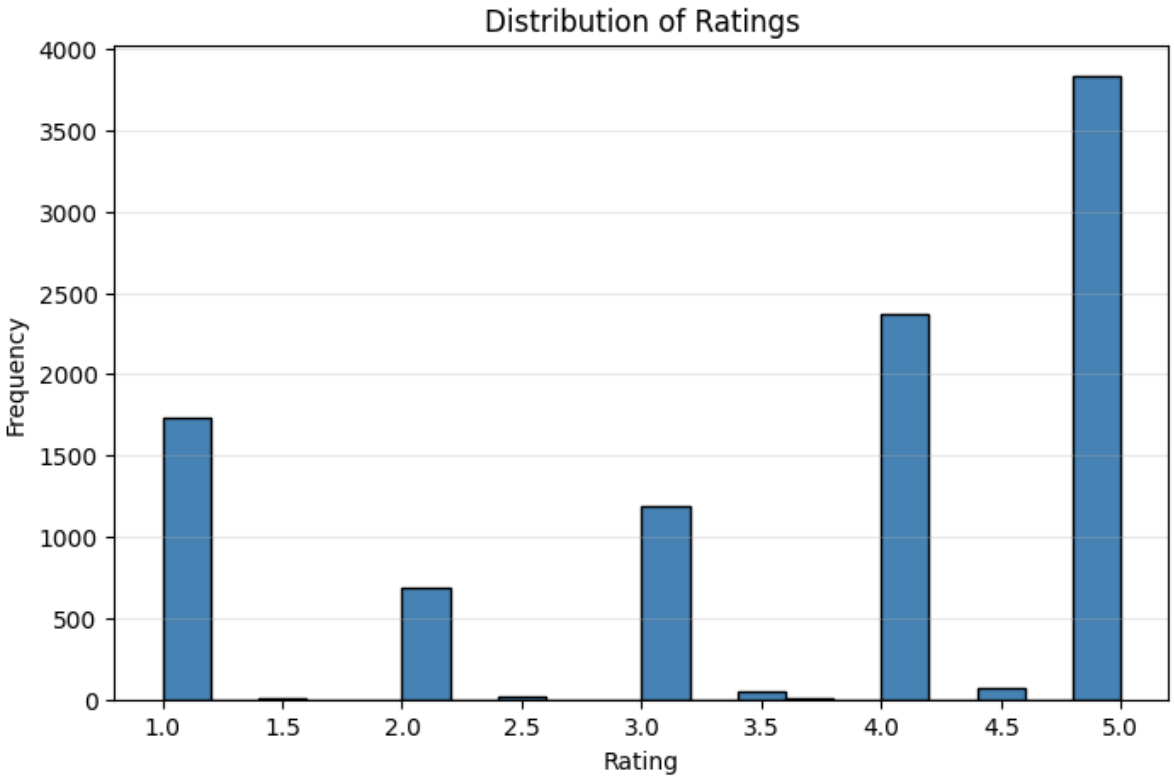
Out[9]:

	Name	Links	Cost	Collections	Cuisines
0	Beyond Flavours	https://www.zomato.com/hyderabad/beyond-flavou...	800	Food Hygiene Rated Restaurants in Hyderabad, C...	Chinese, Continental, Kebab, European, South I...
1	Paradise	https://www.zomato.com/hyderabad/paradise-gach...	800	Hyderabad's Hottest	Biryani, North Indian, Chinese
2	Flechazo	https://www.zomato.com/hyderabad/flechazo-gach...	1,300	Great Buffets, Hyderabad's Hottest	Asian, Mediterranean, North Indian, Desserts
3	Shah Ghouse Hotel & Restaurant	https://www.zomato.com/hyderabad/shah-ghouse-h...	800	Late Night Restaurants	Biryani, North Indian, Chinese, Seafood, Bever...
4	Over The Moon Brew Company	https://www.zomato.com/hyderabad/over-the-moon...	1,200	Best Bars & Pubs, Food Hygiene Rated Restauran...	Asian, Continental, North Indian, Chinese, Med...

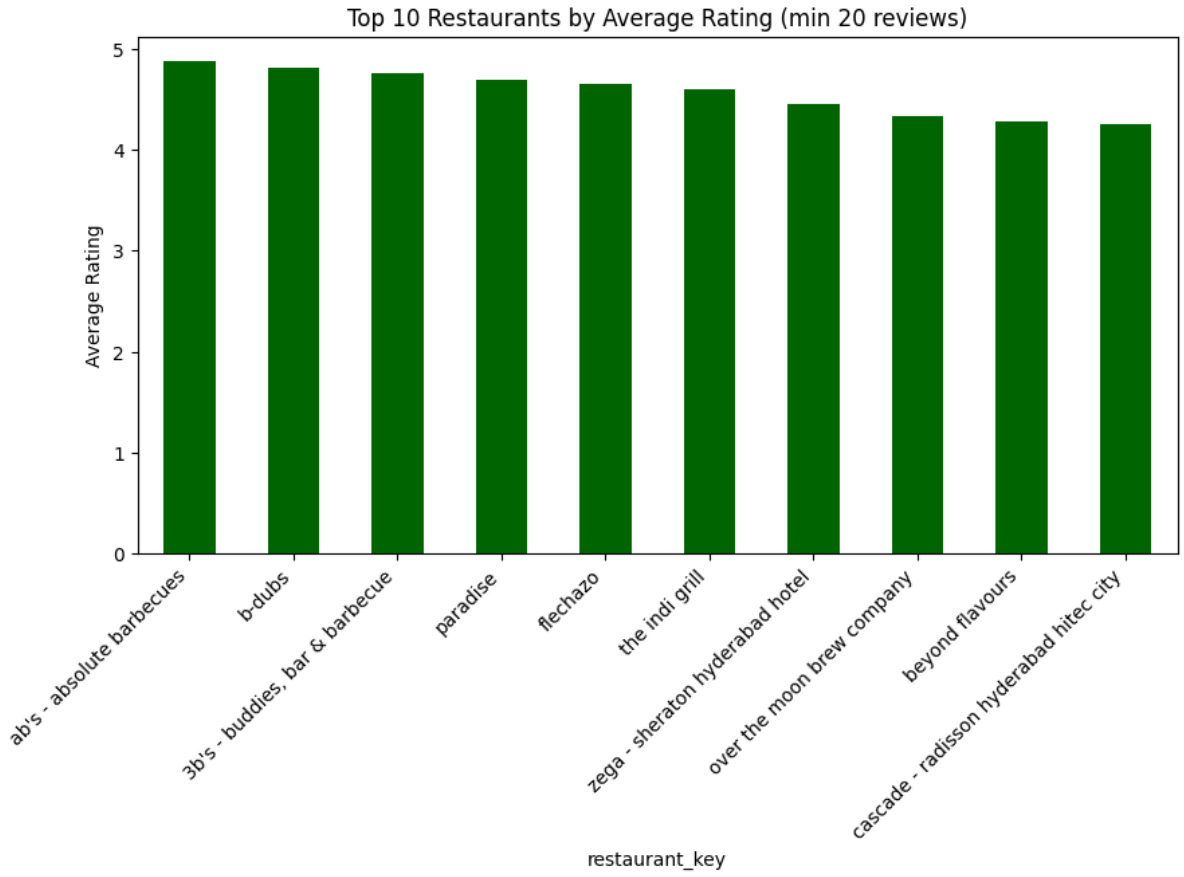
In [10]:
```
# Data Cleaning & Preprocessing
def clean_columns(df):
    df.columns = (
        df.columns.str.strip()
        .str.lower()
        .str.replace(" ", "_")
        .str.replace("[^a-z0-9_]+", "", regex=True)
    )
    return df

reviews_df = clean_columns(reviews_df)
metadata_df = clean_columns(metadata_df)

reviews_df['rating'] = pd.to_numeric(reviews_df['rating'], errors='
reviews_df['time'] = pd.to_datetime(reviews_df['time'], errors='coe

normalize = lambda x: x.astype(str).str.strip().str.lower().str.rep
reviews_df['restaurant_key'] = normalize(reviews_df['restaurant'])
metadata_df['restaurant_key'] = normalize(metadata_df['name'])

reviews_df.drop_duplicates(inplace=True)
metadata_df.drop_duplicates(inplace=True)

rating_mean = reviews_df['rating'].mean()
reviews_df['rating'].fillna(rating_mean, inplace=True)

merged_df = pd.merge(reviews_df, metadata_df, on='restaurant_key',
```

```
/var/folders/76/h0hd92ws6r7cjlnr540_frr40000gn/T/ipykernel_68794/3
701418973.py:25: FutureWarning: A value is trying to be set on a c
opy of a DataFrame or Series through chained assignment using an i
nplace method.
The behavior will change in pandas 3.0. This inplace method will n
ever work because the intermediate object on which we are setting
values always behaves as a copy.

For example, when doing 'df[col].method(value, inplace=True)', try
using 'df.method({col: value}, inplace=True)' or df[col] = df[co
l].method(value) instead, to perform the operation inplace on the
original object.


  reviews_df['rating'].fillna(rating_mean, inplace=True)
```

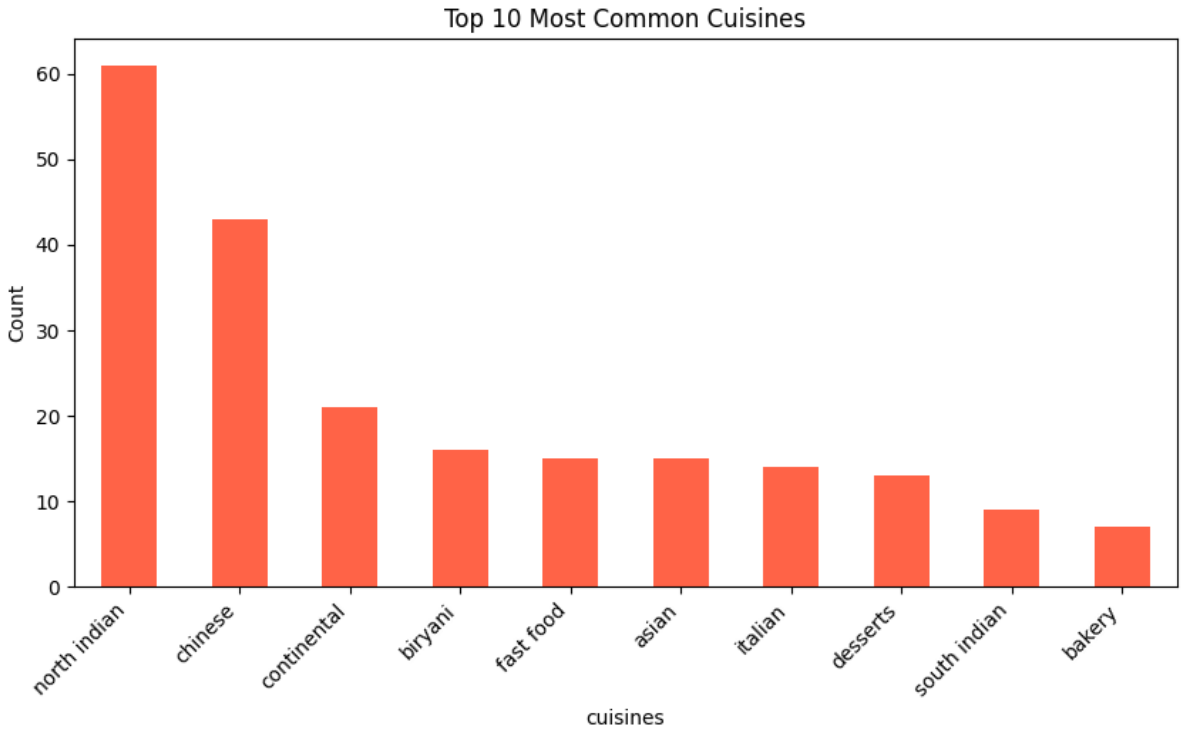
In [11]:
```
# EDA: Rating Distribution
plt.figure(figsize=(8,5))
plt.hist(reviews_df['rating'], bins=20, edgecolor='black', color='s
plt.title("Distribution of Ratings")
plt.xlabel("Rating")
plt.ylabel("Frequency")
plt.grid(axis='y', alpha=0.3)
plt.show()
```



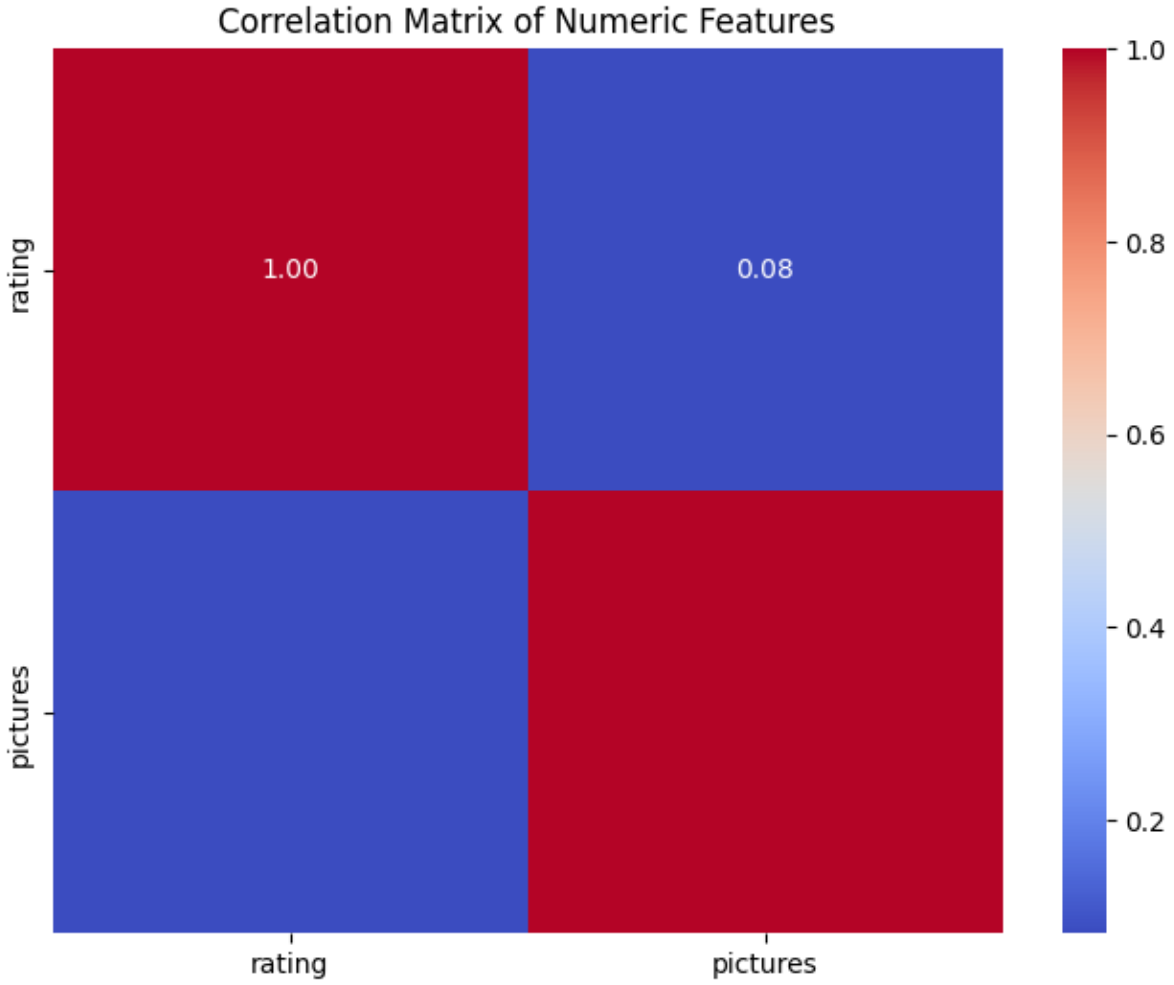
In [12]:
```
# Top Restaurants by Avg Rating
min_reviews = 20
top_restaurants = reviews_df.groupby('restaurant_key').agg(
    avg_rating=('rating', 'mean'),
    n_reviews=('rating', 'count')
).query("n_reviews >= @min_reviews").sort_values('avg_rating', asce

plt.figure(figsize=(10,5))
top_restaurants['avg_rating'].plot(kind='bar', color='darkgreen')
plt.title("Top 10 Restaurants by Average Rating (min 20 reviews)")
plt.ylabel("Average Rating")
plt.xticks(rotation=45, ha='right')
plt.show()
```



In [13]:
```
# Most Common Cuisines
cuisine_series = metadata_df['cuisines'].dropna().astype(str).str.s
cuisine_exploded = cuisine_series.explode().str.strip().str.lower()
top_cuisines = cuisine_exploded.value_counts().head(10)

plt.figure(figsize=(10,5))
top_cuisines.plot(kind='bar', color='tomato')
plt.title("Top 10 Most Common Cuisines")
plt.ylabel("Count")
plt.xticks(rotation=45, ha='right')
plt.show()
```



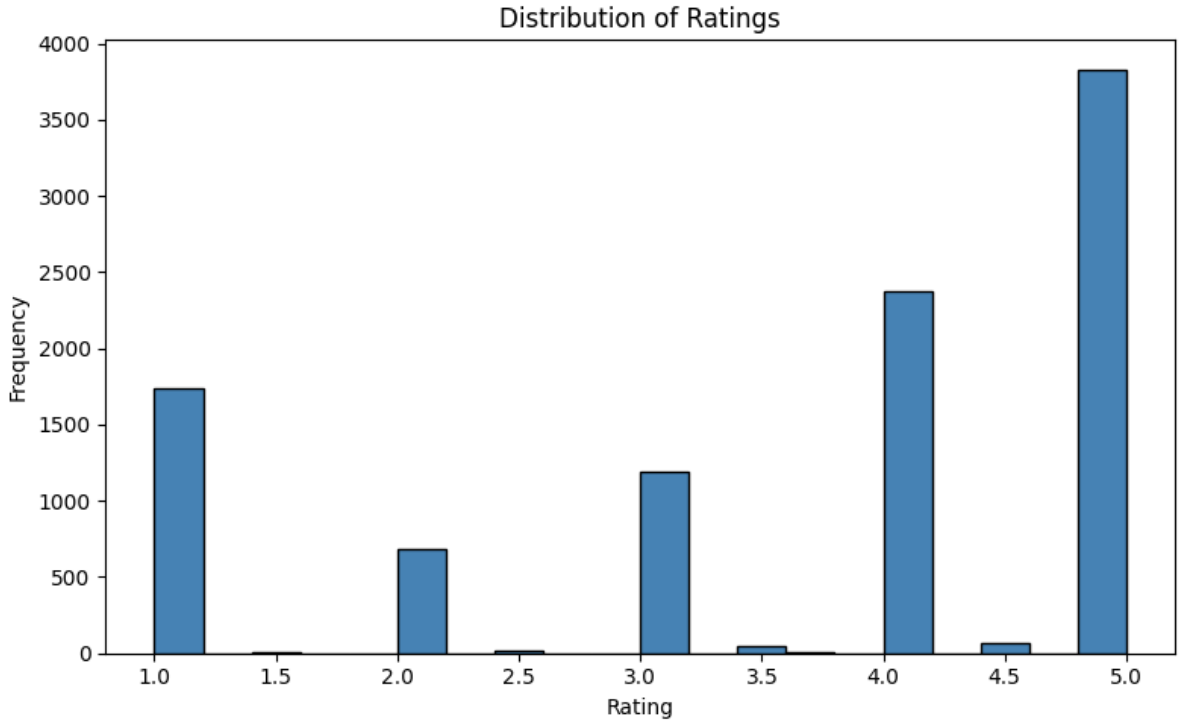
In [14]:
```
# Correlation Matrix
num_cols = merged_df.select_dtypes(include=[np.number])
plt.figure(figsize=(8,6))
sns.heatmap(num_cols.corr(), annot=True, cmap='coolwarm', fmt='.2f'
plt.title("Correlation Matrix of Numeric Features")
plt.show()
```

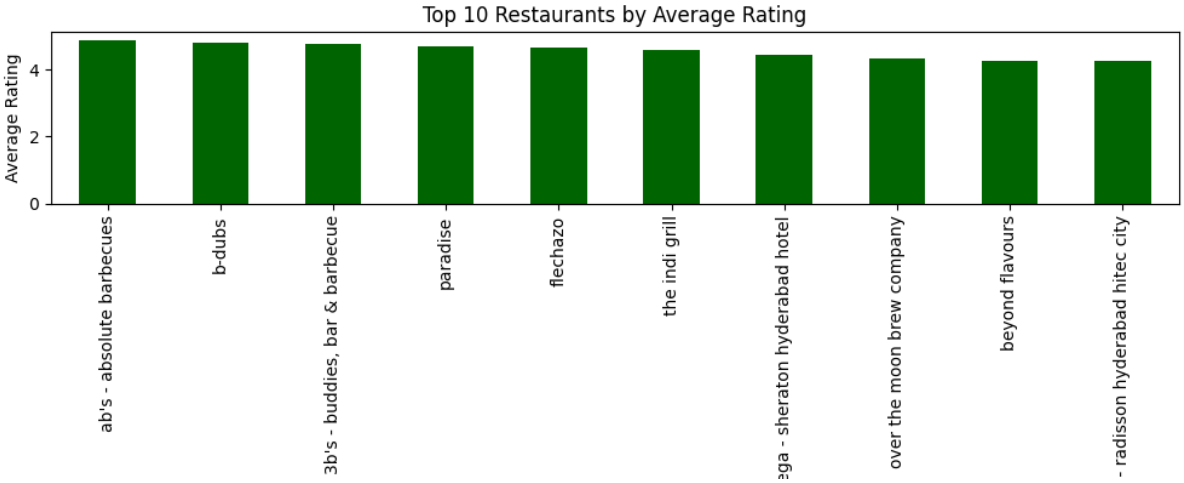


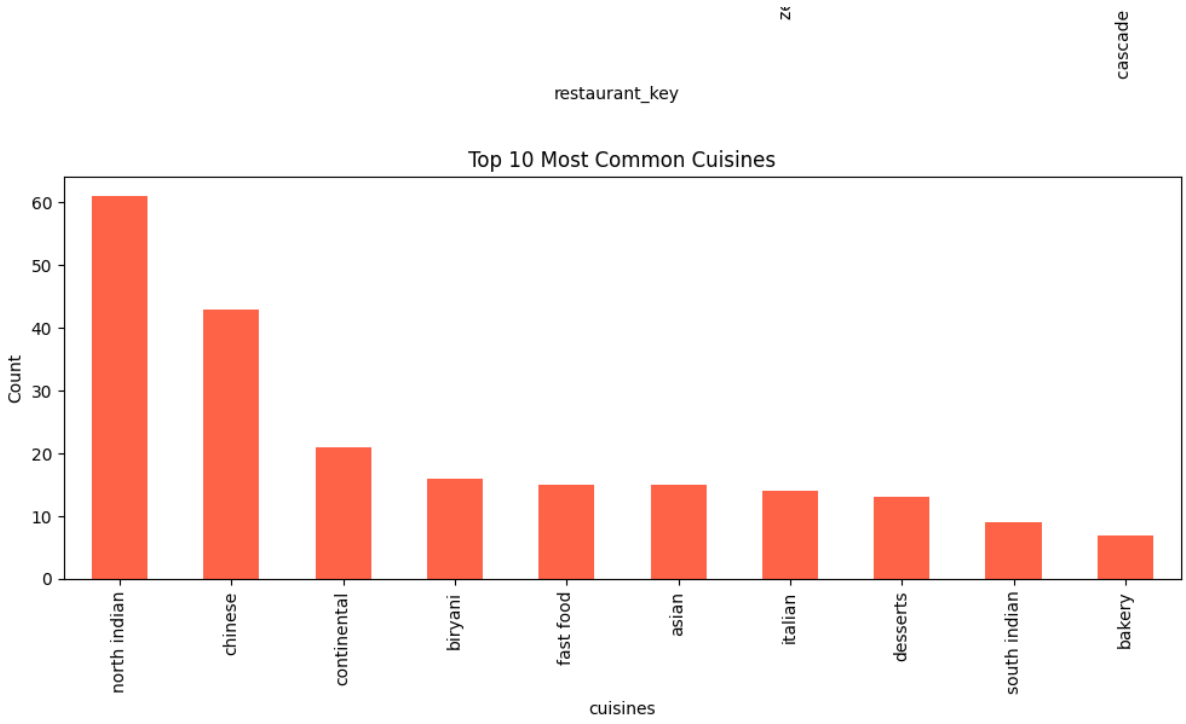
In [16]:
```
# Save Outputs
output_dir = Path("/Users/shivalimuthukumar/Desktop/Zomato_Assignme
plots_dir = Path("/Users/shivalimuthukumar/Desktop/Zomato_Assignmen
output_dir.mkdir(exist_ok=True, parents=True)
plots_dir.mkdir(exist_ok=True, parents=True)

reviews_df.to_csv(output_dir / "clean_reviews.csv", index=False)
metadata_df.to_csv(output_dir / "clean_metadata.csv", index=False)
merged_df.to_csv(output_dir / "merged_zomato.csv", index=False)

plt.figure(figsize=(8,5))
plt.hist(reviews_df['rating'], bins=20, edgecolor='black', color='s
plt.title("Distribution of Ratings")
plt.xlabel("Rating")
plt.ylabel("Frequency")
plt.tight_layout()
plt.savefig(plots_dir / "rating_distribution.png")
```

```
plt.figure(figsize=(10,5))
top_restaurants['avg_rating'].plot(kind='bar', color='darkgreen')
plt.title("Top 10 Restaurants by Average Rating")
plt.ylabel("Average Rating")
plt.tight_layout()
plt.savefig(plots_dir / "top_restaurants.png")

plt.figure(figsize=(10,5))
top_cuisines.plot(kind='bar', color='tomato')
plt.title("Top 10 Most Common Cuisines")
plt.ylabel("Count")
plt.tight_layout()
plt.savefig(plots_dir / "top_cuisines.png")

print("All cleaned files and plots saved in /Users/shivalimuthukuma
```

```
All cleaned files and plots saved in /Users/shivalimuthukumar/Desk
top/Zomato_Assignment.
```






zt
cascade
restaurant_key
Top 10 Most Common Cuisines
Count
0
10
20
30
40
50
60
north indian
chinese
continental
biryani
fast food
asian
italian
desserts
south indian
bakery
cuisines

In [ ]: