INDIAN CUISINES WITH INGREDIENTS

IMPORTING USEFUL LIBRARIES AND READING FILE

In [160]:

```
import pandas as pd
import numpy as np
import seaborn as snb
import matplotlib.pyplot as plt
import statistics as st
```


In [128]:

```
# reading csv
df = pd.read_csv(r"C:\Users\Admin\Desktop\indian_food.csv")
```

ABOUT DATA

In [129]:

```
#first five records of our dataset
df.head()
```

Out[129]:

	name	ingredients	diet	prep_time	cook_time	flavor_profile	course	state	regi
0	Balu shahi	Maida flour, yogurt, oil, sugar	vegetarian	45	25	sweet	dessert	West Bengal	Ea
1	Boondi	Gram flour, ghee, sugar	vegetarian	80	30	sweet	dessert	Rajasthan	We
2	Gajar ka halwa	Carrots, milk, sugar, ghee, cashews, raisins	vegetarian	15	60	sweet	dessert	Punjab	Nor
3	Ghevar	Flour, ghee, kewra, milk, clarified butter, su...	vegetarian	15	30	sweet	dessert	Rajasthan	We
4	Gulab jamun	Milk powder, plain flour, baking powder, ghee,...	vegetarian	15	40	sweet	dessert	West Bengal	Ea

In [130]:

```
#rows and columns
print("Number of rows are :",df.shape[0])
print("Number of columns are : ",df.shape[1])
```

```
Number of rows are : 255
Number of columns are :  9
```

In [131]:

```
#column names
df.columns
```

Out[131]:

```
Index(['name', 'ingredients', 'diet', 'prep_time', 'cook_time',
       'flavor_profile', 'course', 'state', 'region'],
      dtype='object')
```

In [132]:

```
#data type of each column
df.dtypes
```

Out[132]:

```
name              object
ingredients       object
diet              object
prep_time          int64
cook_time          int64
flavor_profile    object
course            object
state             object
region            object
dtype: object
```

In [133]:

```
#checking for null values
df.isnull().sum()
```

Out[133]:

```
name              0
ingredients       0
diet              0
prep_time         0
cook_time         0
flavor_profile    0
course            0
state             0
region            1
dtype: int64
```

OBSERVATION - We have one null value present in region column

In [134]:

```
#distinct number of values in each column
df.nunique()
```

Out[134]:

```
name              255
ingredients       252
diet                2
prep_time          22
cook_time          19
flavor_profile      5
course              4
state              25
region              7
dtype: int64
```


In [135]:

```
#Analysing unique values in few relevant columns
cols= ["diet","prep_time","cook_time","flavor_profile","course","state","region"]
for i in cols:
    print(i,df[i].unique(), sep="\n")
```

```
diet
['vegetarian' 'non vegetarian']
prep_time
[ 45  80  15  10  20   5  30  -1  40  25 480 180 240 120  60 500 150 360
 495  70  35  12]
cook_time
[ 25  30  60  40  50  20   5  45 120  35  90  75  15 720  55  -1  10   2
   6]
flavor_profile
['sweet' 'spicy' 'bitter' '-1' 'sour']
course
['dessert' 'main course' 'starter' 'snack']
state
['West Bengal' 'Rajasthan' 'Punjab' 'Uttar Pradesh' '-1' 'Odisha'
 'Maharashtra' 'Uttarakhand' 'Assam' 'Bihar' 'Andhra Pradesh' 'Karnataka'
 'Telangana' 'Kerala' 'Tamil Nadu' 'Gujarat' 'Tripura' 'Manipur'
 'Nagaland' 'NCT of Delhi' 'Jammu & Kashmir' 'Chhattisgarh' 'Haryana'
 'Madhya Pradesh' 'Goa']
region
['East' 'West' 'North' '-1' 'North East' 'South' 'Central' nan]
```

OBSERVATION - We have -1 in many columns which doesnot makes sense

In [136]:

```
#descriptive statistics of numerical data types
df.describe()
```

Out[136]:

	prep_time	cook_time
count	255.000000	255.000000
mean	31.105882	34.529412
std	72.554409	48.265650
min	-1.000000	-1.000000
25%	10.000000	20.000000
50%	10.000000	30.000000
75%	20.000000	40.000000
max	500.000000	720.000000

OBSERVATION - MIN value of -1 also indicates the same problem

In [137]:

```
#description for non-numerical data
df.describe(include=object)
```

Out[137]:

	name	ingredients	diet	flavor_profile	course	state	region
count	255	255	255	255	255	255	254
unique	255	252	2	5	4	25	7
top	Balu shahi	Gram flour, ghee, sugar	vegetarian	spicy	main course	Gujarat	West
freq	1	2	226	133	129	35	74

DATA CLEANING

1. FIXING NULL VALUES

In [138]:

```
#checking for other rows with state Uttar Pradesh
df[df["state"]=="Uttar Pradesh"]
```

Out[138]:

	name	ingredients	diet	prep_time	cook_time	flavor_profile	course	state	r
6	Jalebi	Maida, corn flour, baking soda, vinegar, curd,...	vegetarian	10	50	sweet	dessert	Uttar Pradesh	
13	Petha	Firm white pumpkin, sugar, kitchen lime, alum ...	vegetarian	10	30	sweet	dessert	Uttar Pradesh	
15	Rabri	Condensed milk, sugar, spices, nuts	vegetarian	10	45	sweet	dessert	Uttar Pradesh	
18	Sohan halwa	Corn flour, ghee, dry fruits	vegetarian	10	60	sweet	dessert	Uttar Pradesh	
90	Kachori	Moong dal, rava, garam masala, dough, fennel s...	vegetarian	30	60	spicy	snack	Uttar Pradesh	
95	Kofta	Paneer, potato, cream, corn flour, garam masala	vegetarian	20	40	spicy	main course	Uttar Pradesh	
97	Lauki ke kofte	Bottle gourd, garam masala powder, gram flour,...	vegetarian	20	40	spicy	main course	Uttar Pradesh	
105	Navrattan korma	Green beans, potatoes, khus khus, low fat, gar...	vegetarian	25	40	spicy	main course	Uttar Pradesh	
110	Panjeeri	Whole wheat flour, musk melon seeds, poppy see...	vegetarian	10	25	sweet	dessert	Uttar Pradesh	

In [139]:

```
#replacing the null with actual value that should have been there---NORTH
df["region"].replace(np.nan,"North",inplace=True)
```

In [140]:

```
#Verification of replacement
df.isnull().sum()
```

Out[140]:

```
name              0
ingredients       0
diet              0
prep_time         0
cook_time         0
flavor_profile    0
course            0
state             0
region            0
dtype: int64
```

2. FIXING IRRELEVANT VALUES (-1)

Columns where negative value is irrelevant prep_time, cook_time, flavor_profile, state, region

In [141]:

```
#conditional statement with & operator
df[(df["state"]=="-1") & (df["region"]=="-1")]
```

Out[141]:

	name	ingredients	diet	prep_time	cook_time	flavor_profile	course	state	regi
7	Kaju katli	Cashews, ghee, cardamom, sugar	vegetarian	10	20	sweet	dessert	-1	
9	Kheer	Milk, rice, sugar, dried fruits	vegetarian	10	40	sweet	dessert	-1	
10	Laddu	Gram flour, ghee, sugar	vegetarian	10	40	sweet	dessert	-1	
12	Nankhatai	Refined flour, besan, ghee, powdered sugar, yo...	vegetarian	20	30	sweet	dessert	-1	
94	Khichdi	Moong dal, green peas, ginger, tomato, green c...	vegetarian	40	20	spicy	main course	-1	
96	Kulfi falooda	Rose syrup, falooda sev, mixed nuts, saffron, ...	vegetarian	45	25	sweet	dessert	-1	
98	Lauki ki subji	Bottle gourd, coconut oil, garam masala, ginge...	vegetarian	10	20	spicy	main course	-1	
109	Pani puri	Kala chana, mashed potato, boondi, sev, lemon	vegetarian	15	2	spicy	snack	-1	
111	Papad	Urad dal, sev, lemon juice, chopped tomatoes	vegetarian	5	5	spicy	snack	-1	
117	Samosa	Potatoes, green peas, garam masala, ginger, dough	vegetarian	30	30	spicy	snack	-1	
164	Upma	Chana dal, urad dal, ginger, curry leaves, sugar	vegetarian	10	20	spicy	snack	-1	

	name	ingredients	diet	prep_time	cook_time	flavor_profile	course	state	regi
231	Brown Rice	Brown rice, soy sauce, olive oil	vegetarian	15	25	-1	main course	-1	
248	Red Rice	Red pepper, red onion, butter, watercress, oli...	vegetarian	-1	-1	-1	main course	-1	

In [142]:

```
#dropping these rows as we connot impute without having these details.
df.drop(df[(df["state"]=="-1") & (df["region"]=="-1")].index,inplace=True)
```


In [143]:

```
#Records where value is -1 in state column
df[df["state"]=="-1"]
```

Out[143]:

	name	ingredients	diet	prep_time	cook_time	flavor_profile	course	state	re
115	Rajma chaval	Red kidney beans, garam masala powder, ginger,...	vegetarian	15	90	spicy	main course	-1	
128	Dosa	Chana dal, urad dal, whole urad dal, blend ric...	vegetarian	360	90	spicy	snack	-1	S
130	Idli	Split urad dal, urad dal, idli rice, thick poh...	vegetarian	360	90	spicy	snack	-1	S
144	Masala Dosa	Chana dal, urad dal, potatoes, idli rice, thic...	vegetarian	360	90	spicy	snack	-1	S
145	Pachadi	Coconut oil, cucumber, curd, curry leaves, mus...	vegetarian	10	25	-1	main course	-1	S
149	Payasam	Rice, cashew nuts, milk, raisins, sugar	vegetarian	15	30	sweet	dessert	-1	S
154	Rasam	Tomato, curry leaves, garlic, mustard seeds, h...	vegetarian	10	35	spicy	main course	-1	S
156	Sambar	Pigeon peas, eggplant, drumsticks, sambar powd...	vegetarian	20	45	spicy	main course	-1	S
158	Sevai	Sevai, parboiled rice, steamer	vegetarian	120	30	-1	main course	-1	S
161	Uttapam	Chana dal, urad dal, thick poha, tomato, butter	vegetarian	10	20	spicy	snack	-1	S

	name	ingredients	diet	prep_time	cook_time	flavor_profile	course	state	re
		Urad dal, ginger, curry							

OBSERVATION - North and South region have missing states

In [144]:

```
#Converting all other -1 values so that we can perform EDA
df.replace([-1,"-1"],np.nan,inplace=True)
```

EXPLORATORY DATA ANALYSIS

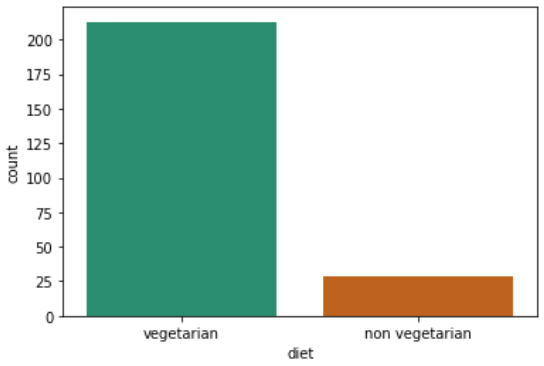
A. DIET

1. Vegetarian Diet V/s Non-Vegetarian Diet

In [145]:

```
snb.countplot(df["diet"],palette='Dark2');
```

```
C:\Users\Admin\anaconda3\lib\site-packages\seaborn\_decorators.py:36: Future
Warning: Pass the following variable as a keyword arg: x. From version 0.12,
the only valid positional argument will be `data`, and passing other argumen
ts without an explicit keyword will result in an error or misinterpretation.
  warnings.warn(
```



Findings- Vegetarian diet is preferred in India and maximum data is for Vegetarian Food

In [146]:

```
n=df.groupby(["diet","region"])
```

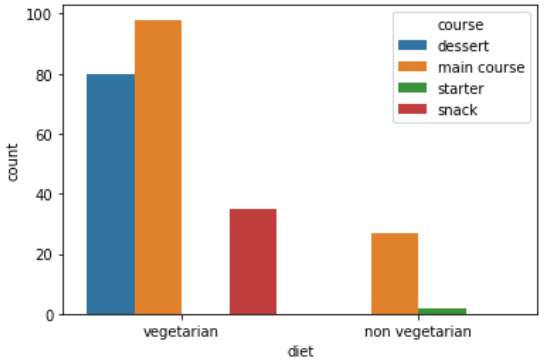

In [147]:

```
#df.groupby(["diet","region"]).groups.keys()
```

2. Variety Of Courses Available In Particular Diet

In [148]:

```
snb.countplot(x=df["diet"],hue=df["course"]);
```

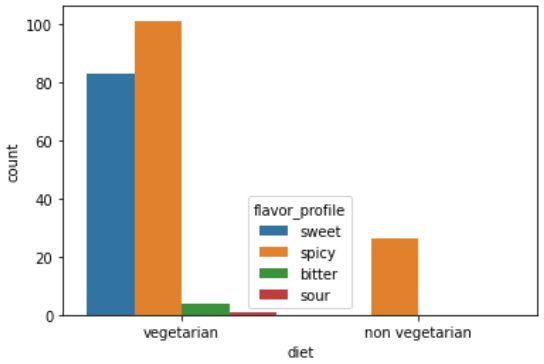


Findings- There is no starter dish in VEG and no Dessert,snack in NON-VEG

In both Diets, Main course has the highest liking.

In [149]:

```
snb.countplot(x=df["diet"],hue=df["flavor_profile"]);
```



Findings-In veg diet spicy flavour is preferred followed by sweet.

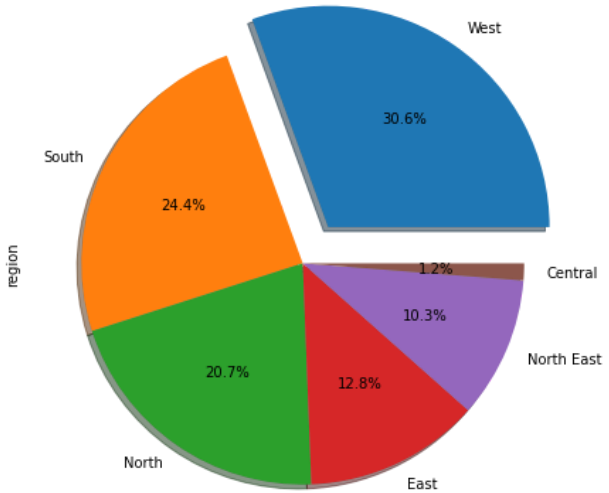
In non veg diet only spicy flavour is preferred

B. REGION

1.Proportion of Dishes According to Region

In [150]:

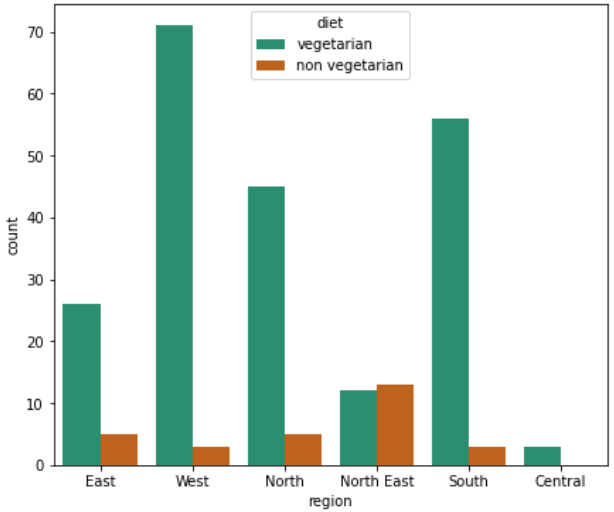
```
df["region"].value_counts().plot.pie(autopct='%1.1f%%',shadow=True,figsize=(7,9),explode=[0
```



Findings- Maximum dishes belong to West region

In [151]:

```
plt.subplots(figsize=(7,6))
snb.countplot(x=df["region"],hue=df["diet"],palette='Dark2');
```



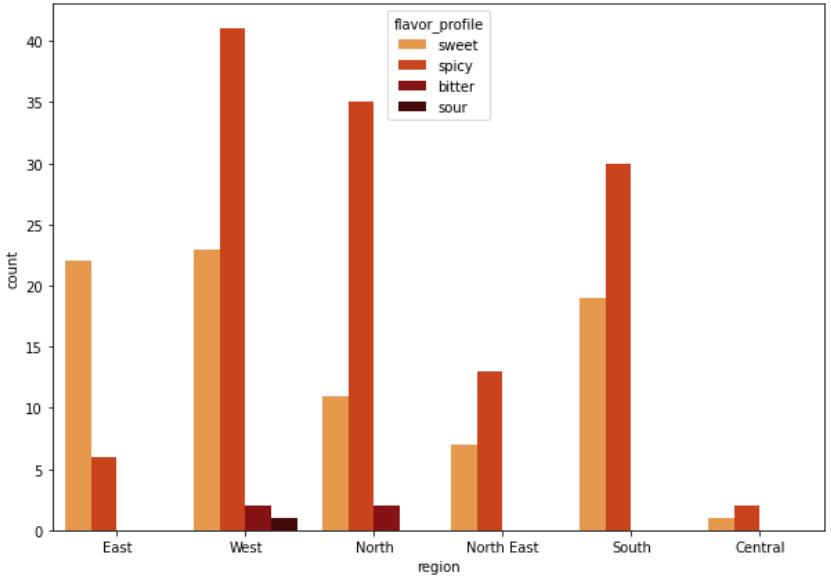
Findings- Central region has no non veg dish

In North East non veg wins over veg diet

4. Flavours by Region

In [152]:

```
plt.subplots(figsize=(10,7))
snb.countplot(x=df["region"],hue=df["flavor_profile"],palette="gist_heat_r");
```



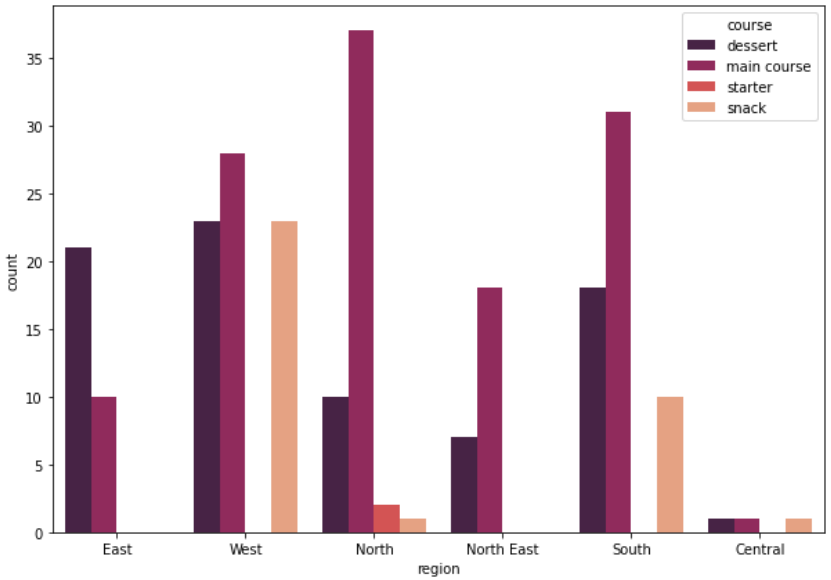
Findings- In all region, two flavours i.e., SWEET and SPICY are preferred over other flavours In West,North,North East South and Central SPICY flavour is preferred over SWEET.*

Only In East Region, SWEET Flavour Is preferred than SPICY WEST is the only region having all the flavours of dish

5.Type of Course By Region

In [153]:

```
plt.subplots(figsize=(10,7))
snb.countplot(x=df["region"],hue=df["course"],palette="rocket");
```



Findings MAIN COURSE is Staple Course In North followed by West,South and North East

DESSERTS are Preferred Most in EAST followed by West,South,North,North East

SNACKS are preferred only in WEST,South majorly.

3. Cooking time

In [154]:

```
# creating new dataset
df_cook = df[["name","cook_time","course","flavor_profile","region"]]
df_cook.head()
```

Out[154]:

	name	cook_time	course	flavor_profile	region
0	Balu shahi	25.0	dessert	sweet	East
1	Boondi	30.0	dessert	sweet	West
2	Gajar ka halwa	60.0	dessert	sweet	North
3	Ghevar	30.0	dessert	sweet	West
4	Gulab jamun	40.0	dessert	sweet	East

Average Cooking Time According To Course

In [155]:

```
cook_time_mean= df_cook.groupby(["course"]).mean()
cook_time_mean.apply(lambda x: x.sort_values(ascending=False))
```

Out[155]:

	cook_time
course	
dessert	48.445946
starter	37.500000
main course	35.654206
snack	33.781250

Dessert dishes with min and max cooking time

In [156]:

```
pd.DataFrame(df_cook[df_cook["course"]=="dessert"].agg({max,min}))
```

Out[156]:

	name	cook_time	course	flavor_profile	region
min	Adhirasam	5.0	dessert	sweet	Central
max	Unni Appam	720.0	dessert	sweet	West

Main Course dishes with min and max cooking time

In [157]:

```
pd.DataFrame(df_cook[df_cook["course"]=="main course"].agg({max,min}))
```

Out[157]:

	name	cook_time	course	region
min	Aloo gobi	10.0	main course	Central
max	Zunka	120.0	main course	West

Snack dishes with min and max cooking time

In [158]:

```
pd.DataFrame(df_cook[df_cook["course"]=="snack"].agg({max,min}))
```

Out[158]:

	name	cook_time	course	region
min	Attu	5.0	snack	Central
max	Vada	90.0	snack	West

Starter Dishes with Min and MAx time

In [159]:

```
pd.DataFrame(df_cook[df_cook["course"]=="starter"].agg({max,min}))
```

Out[159]:

	name	cook_time	course	flavor_profile	region
min	Chicken Tikka	30.0	starter	spicy	North
max	Tandoori Fish Tikka	45.0	starter	spicy	North

In [ ]: