```
import pandas as pd
import numpy as np
import seaborn as sns
```

```
ind_food_df = pd.read_csv('/content/Indian food eda.zip')
```

```
ind_food_df
```

	name	ingredients	diet	prep_time	cook_time	flavor_profile	course	state	region
0	Balu shahi	Maida flour, yogurt, oil, sugar	vegetarian	45	25	sweet	dessert	West Bengal	East
1	Boondi	Gram flour, ghee, sugar	vegetarian	80	30	sweet	dessert	Rajasthan	West
2	Gajar ka halwa	Carrots, milk, sugar, ghee, cashews, raisins	vegetarian	15	60	sweet	dessert	Punjab	North
3	Ghevar	Flour, ghee, kewra, milk, clarified butter, su...	vegetarian	15	30	sweet	dessert	Rajasthan	West
4	Gulab jamun	Milk powder, plain flour, baking powder, ghee,...	vegetarian	15	40	sweet	dessert	West Bengal	East
...	...	...	...	...	...	...	...	...	...
250	Til Pitha	Glutinous rice, black sesame seeds, gur	vegetarian	5	30	sweet	dessert	Assam	North East
251	Bebinca	Coconut milk, egg yolks, clarified butter, all...	vegetarian	20	60	sweet	dessert	Goa	West
252	Shufta	Cottage cheese, dry dates, dried rose petals, ...	vegetarian	-1	-1	sweet	dessert	Jammu & Kashmir	North
253	Mawa Bati	Milk powder, dry fruits, arrowroot powder, all...	vegetarian	20	45	sweet	dessert	Madhya Pradesh	Central
254	Pinaca	Brown rice, fennel seeds, grated coconut, blac...	vegetarian	-1	-1	sweet	dessert	Goa	West

255 rows × 9 columns

```
ind_food_df.head(20)
```

	name	ingredients	diet	prep_time	cook_time	flavor_profile	course	state	region
0	Balu shahi	Maida flour, yogurt, oil, sugar	vegetarian	45	25	sweet	dessert	West Bengal	East
1	Boondi	Gram flour, ghee, sugar	vegetarian	80	30	sweet	dessert	Rajasthan	West
2	Gajar ka halwa	Carrots, milk, sugar, ghee, cashews, raisins	vegetarian	15	60	sweet	dessert	Punjab	North
3	Ghevar	Flour, ghee, kewra, milk, clarified butter, su...	vegetarian	15	30	sweet	dessert	Rajasthan	West
4	Gulab jamun	Milk powder, plain flour, baking powder, ghee,...	vegetarian	15	40	sweet	dessert	West Bengal	East
5	Imarti	Sugar syrup, lentil flour	vegetarian	10	50	sweet	dessert	West Bengal	East

```
ind_food_df.shape
```

	name	ingredients	diet	prep_time	cook_time	flavor_profile	course	state	region
6	Jalebi	Maida, corn flour, baking soda, vinegar, curd,...	vegetarian	10	50	sweet	dessert	Uttar Pradesh	North
7	Kaju katli	Cashews, ghee, cardamom, sugar	vegetarian	10	20	sweet	dessert	-1	-1
8	Kalakand	Milk, cottage cheese, sugar	vegetarian	20	30	sweet	dessert	West Bengal	East
9	Kheer	Milk, rice, sugar, dried fruits	vegetarian	10	40	sweet	dessert	-1	-1
10	Laddu	Gram flour, ghee, sugar	vegetarian	10	40	sweet	dessert	-1	-1
11	Lassi	Yogurt, milk, nuts, sugar	vegetarian	5	5	sweet	dessert	Punjab	North
12	Nankhatai	Refined flour, besan, ghee, powdered sugar, yo...	vegetarian	20	30	sweet	dessert	-1	-1
13	Petha	Firm white pumpkin, sugar, kitchen lime, alum ...	vegetarian	10	30	sweet	dessert	Uttar Pradesh	North
14	Phirni	Rice, sugar, nuts	vegetarian	30	20	sweet	dessert	Odisha	East
15	Rabri	Condensed milk, sugar, spices, nuts	vegetarian	10	45	sweet	dessert	Uttar Pradesh	North

```
(255, 9)
```

```
dfshape = ind_food_df.shape
```

```
type(dfshape)
```

```
tuple
```

```
ind_food_df.columns
```

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

```
ind_food_df.isna().sum()
```

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

```
ind_food_df.describe()
```

	prep_time	cook_time	count
	255.000000	255.000000	

```
          mean     31.105882 34.529412
           std     72.554409 48.265650

           min     -1.000000  -1.000000
  ind_food_df.info25%
                  10.000000 20.000000
   <bound method DataFrame.info of                  name                                    ingredients  \50%10.00000030.000000
      0           Balu shahi              Maida flour, yogurt, oil, sugar
      1           Boondi                  Gram flour, ghee, sugar   75%  20.00000040.000000
      2           Gajar ka halwa      Carrots, milk, sugar, ghee, cashews, raisins   3          Ghevar  Flour, ghee, kewra, milk,
                  clarified butter, su...   max      500.000000      720.000000 4       Gulab jamun  Milk powder, plain flour, baking
                  powder, ghee,...
      ..              ...                                          ...
      250    Til Pitha          Glutinous rice, black sesame seeds, gur   251
      Bebinca  Coconut milk, egg yolks, clarified butter, all...
      252        Shufta  Cottage cheese, dry dates, dried rose petals, ...
      253        Mawa Bati  Milk powder, dry fruits, arrowroot powder, all...   254        Pinaca  Brown
                  rice, fennel seeds, grated coconut, blac...

              diet  prep_time  cook_time flavor_profile   course  \
      0    vegetarian          45         25          sweet  dessert
      1    vegetarian          80         30          sweet  dessert
      2    vegetarian          15         60          sweet  dessert
      3    vegetarian          15         30          sweet  dessert
      4    vegetarian          15         40          sweet  dessert  ..       ...       ...       ...       ...       ...
      250  vegetarian           5         30          sweet  dessert
      251  vegetarian          20         60          sweet  dessert
      252  vegetarian          -1         -1          sweet  dessert
      253  vegetarian          20         45          sweet  dessert   254  vegetarian        -1       -1       sweet  dessert

                  state        region  0
      West Bengal        East
      1          Rajasthan        West
      2          Punjab        North
      3          Rajasthan        West
      4          West Bengal        East  ..           ...           ...
      250       Assam  North East
      251       Goa         West
      252       Jammu & Kashmir        North
      253       Madhya Pradesh     Central
      254       Goa         West

      [255 rows x 9 columns]>
```

```
ind_food_df.head(50)
```

	name	ingredients	diet	prep_time	cook_time	flavor_profile	course	state	region
0	Balu shahi	Maida flour, yogurt, oil, sugar	vegetarian	45	25	sweet	dessert	West Bengal	East
1	Boondi	Gram flour, ghee, sugar	vegetarian	80	30	sweet	dessert	Rajasthan	West
2	Gajar ka halwa	Carrots, milk, sugar, ghee, cashews, raisins	vegetarian	15	60	sweet	dessert	Punjab	North

#	name	ingredients	diet	prep_time	cook_time	flavor_profile	course	state	region
3	Ghevar	Flour, ghee, kewra, milk, clarified butter, su...	vegetarian	15	30	sweet	dessert	Rajasthan	West
4	Gulab jamun	Milk powder, plain flour, baking powder, ghee,...	vegetarian	15	40	sweet	dessert	West Bengal	East
5	Imarti	Sugar syrup, lentil flour	vegetarian	10	50	sweet	dessert	West Bengal	East
6	Jalebi	Maida, corn flour, baking soda, vinegar, curd,...	vegetarian	10	50	sweet	dessert	Uttar Pradesh	North
7	Kaju katli	Cashews, ghee, cardamom, sugar	vegetarian	10	20	sweet	dessert	-1	-1
8	Kalakand	Milk, cottage cheese, sugar	vegetarian	20	30	sweet	dessert	West Bengal	East
9	Kheer	Milk, rice, sugar, dried fruits	vegetarian	10	40	sweet	dessert	-1	-1
10	Laddu	Gram flour, ghee, sugar	vegetarian	10	40	sweet	dessert	-1	-1
11	Lassi	Yogurt, milk, nuts, sugar	vegetarian	5	5	sweet	dessert	Punjab	North
12	Nankhatai	Refined flour, besan, ghee, powdered sugar, yo...	vegetarian	20	30	sweet	dessert	-1	-1
13	Petha	Firm white pumpkin, sugar, kitchen lime, alum ...	vegetarian	10	30	sweet	dessert	Uttar Pradesh	North
14	Phirni	Rice, sugar, nuts	vegetarian	30	20	sweet	dessert	Odisha	East
15	Rabri	Condensed milk, sugar, spices, nuts	vegetarian	10	45	sweet	dessert	Uttar Pradesh	North
16	Sheera	Semolina, ghee, nuts, milk	vegetarian	10	25	sweet	dessert	Maharashtra	West
17	Singori	Khoa, coconut, molu leaf	vegetarian	10	20	sweet	dessert	Uttarakhand	North
18	Sohan halwa	Corn flour, ghee, dry fruits	vegetarian	10	60	sweet	dessert	Uttar Pradesh	North

Gram flour, ghee, sugar,

19		Sohan papdi	vegetarian -1	60	sweet	dessert	Maharashtra	West	

milk, cardamom

20		Chhena jalebi	Chhena, sugar, ghee	vegetarian 10	50	sweet	dessert	Odisha	East
21		Chhena kheeri	Chhena, sugar, milk	vegetarian -1	60	sweet	dessert	Odisha	East
22		Chhena poda	Sugar, chenna cheese	vegetarian 10	45	sweet	dessert	Odisha	East

Flour, cream, sugar, saffron,

| **23** | | Cham cham | vegetarian 40 | 60 | sweet | dessert | West Bengal | East |

lemon juice, coc...

Chenna, condensed milk,

| **24** | | Kheer sagar | vegetarian 25 | 60 | sweet | dessert | Odisha | East |

sugar, saffron, cardamom

| **25** | | Ledikeni | Chhena, sugar, ghee | vegetarian 45 | 45 | sweet | dessert | West Bengal |
| | | East | | | | | | |

		Flour fried milk power						North	
26	Lyangcha	Flour, fried milk power, sugar syrup	vegetarian	20	30	sweet	dessert	Assam	North East
27	Malapua	Yoghurt, refined flour, ghee, fennel seeds	vegetarian	10	120	sweet	dessert	Bihar	North
28	Mihidana	Besan flour, sugar, ghee	vegetarian	15	30	sweet	dessert	West Bengal	East
29	Misti doi	Milk, jaggery	vegetarian	480	30	sweet	dessert	West Bengal	East
30	Pantua	Chhena, sugar, ghee, flour	vegetarian	45	45	sweet	dessert	West Bengal	East
31	Pithe	Rice flour, wheat flour	vegetarian	15	35	sweet	dessert	Assam	North East
32	Rasabali	Chenna, sweetened milk	vegetarian	15	30	sweet	dessert	Odisha	East
33	Ras malai	Chhena, reduced milk, pistachio	vegetarian	180	60	sweet	dessert	West Bengal	East
34	Rasgulla	Chhena, sugar, cardamom	vegetarian	10	90	sweet	dessert	West Bengal	East
35	Sandesh	Milk, sugar, saffron, cardamom	vegetarian	30	20	sweet	dessert	West Bengal	East
36	Adhirasam	Rice flour, jaggery, ghee, vegetable oil, elachi	vegetarian	10	50	sweet	dessert	West Bengal	East

`ind_food_df`**37**`['region'`Ariselu`]==-1` Rice flour, jaggery, ghee | vegetarian | 15 | 75 | sweet | dessert | Andhra Pradesh | South |

| | | | vegetarian | 5 | 35 | sweet | dessert | Andhra Pradesh | South |
| **0** **38** | `False`Bandar laddu | Besan, jaggery, cardamom powder, ghee, cashews... | | | | | | | |

```
1    False
2    False
```

```
    3   False
    4   False      ...  250     False
          251    False
252     False
253     False
254     False
Name: region, Length: 255, dtype: bool
```

```
ind_food_df[ind_food_df['region']=='-1']
```

	name	ingredients	diet	prep_time	cook_time	flavor_profile	course	state	region	
7	Kaju katli	Cashews, ghee, cardamom, sugar	vegetarian	10	20	sweet	dessert	-1	-1	
9	Kheer	Milk, rice, sugar, dried fruits	vegetarian	10	40	sweet	dessert	-1	-1	
10	Laddu	Gram flour, ghee, sugar	vegetarian	10	40	sweet	dessert	-1	-1	
12	Nankhatai	Refined flour, besan, ghee, powdered sugar, yo...	vegetarian	20	30	sweet	dessert	-1	-1	
94	Khichdi	Moong dal, green peas, ginger, tomato, green c...	vegetarian	40	20	spicy	main course	-1	-1	

```
ind_food_df.loc[ind_food_df['region']=='-1', 'region'] = 'West'
ind_food_df[:]
```

	name	ingredients	diet	prep_time	cook_time	flavor_profile	course	state	region	
96	Kulfi falooda	Rose syrup, falooda sev, mixed nuts, saffron, ...	vegetarian	45	25	sweet	dessert	-1	-1	
98	Lauki ki subji	Bottle gourd, coconut oil, garam masala, ginge...	vegetarian	10	20	spicy	main course	-1	-1	
109	Pani puri	Kala chana, mashed potato, boondi, sev, lemon	vegetarian	15	2	spicy	snack	-1	-1	
111	Balu shahi Papad	Urad dal, sev, lemon juice, chopped tomatoes Maida flour, yogurt, oil, sugar	vegetarian vegetarian	45	5	25 sweet spicy	dessert snack	West Bengal -1	5 East -1	
117	Samosa Boondi	Potatoes, green peas, garam masala, ginger, dough Gram flour, ghee, sugar	vegetarian vegetarian	80	30	30 sweet spicy	dessert snack	Rajasthan -1	30 West -1	
1642	Gajar ka halwa Upma	Carrots, milk, sugar, ghee, cashews, raisins Chana dal, urad dal, ginger, curry leaves, sugar	vegetarian vegetarian	60	20	15 sweet spicy	dessert snack	Punjab -1	10 North -1	
2313	Brown Rice Ghevar	Flour, ghee, kewra, milk, clarified butter, su... Brown rice, soy sauce, olive oil	vegetarian vegetarian	15 sweet	15 dessert	30 -1	main course	Rajasthan -1	25 West -1	
2484	Gulab jamun Red Rice	Milk powder, plain flour, baking powder, ghee,... Red pepper, red onion, butter, watercress, oli...	vegetarian vegetarian	15 40	-1 sweet	dessert	-1 main course	West Bengal -1	-1 East -1	
5	Imarti	Sugar syrup, lentil flour	vegetarian	10	50	sweet	dessert	West Bengal	East	
6	Jalebi	Maida, corn flour, baking soda, vinegar, curd,...	vegetarian	10	50	sweet	dessert	Uttar Pradesh	North	
7	Kaju katli	Cashews, ghee, cardamom, sugar	vegetarian	10	20	sweet	dessert	-1	West	
8	Kalakand	Milk, cottage cheese, sugar	vegetarian	20	30	sweet	dessert	West Bengal	East	
9	Kheer	Milk, rice, sugar, dried fruits	vegetarian	10	40	sweet	dessert	-1	West	

```
ind_food_df[ind_food_df['region']=='-1']
```

name	ingredients	diet	prep_time	cook_time	flavor_profile	course	state	region

```
type(ind_food_df)
```

        pandas.core.frame.DataFrame

```
ind_food_df['region'].value_counts()
```

        West   87
        South   59
        North   49
        East   31
        North East   25
        Central   3
        Name: region, dtype: int64

```
import seaborn as sns
import matplotlib
import matplotlib.pyplot as plt
%matplotlib inline

sns.set_style('darkgrid')
matplotlib.rcParams['font.size'] = 14
matplotlib.rcParams['figure.figsize'] = (9, 5)
matplotlib.rcParams['figure.facecolor'] = '#00000000'
```

```
ind_food_df
```

	name	ingredients	diet	prep_time	cook_time	flavor_profile	course	state	region
0	Balu shahi	Maida flour, yogurt, oil, sugar	vegetarian	45	25	sweet	dessert	West Bengal	East
1	Boondi	Gram flour, ghee, sugar	vegetarian	80	30	sweet	dessert	Rajasthan	West
2	Gajar ka halwa	Carrots, milk, sugar, ghee, cashews, raisins	vegetarian	15	60	sweet	dessert	Punjab	North
3	Ghevar	Flour, ghee, kewra, milk, clarified butter, su...	vegetarian	15	30	sweet	dessert	Rajasthan	West
4	Gulab jamun	Milk powder, plain flour, baking powder, ghee,...	vegetarian	15	40	sweet	dessert	West Bengal	East
...	...	...	...	...	...	...	...	...	...
250	Til Pitha	Glutinous rice, black sesame seeds, gur	vegetarian	5	30	sweet	dessert	Assam	North East
251	Bebinca	Coconut milk, egg yolks, clarified butter, all...	vegetarian	20	60	sweet	dessert	Goa	West
252	Shufta	Cottage cheese, dry dates, dried rose petals, ...	vegetarian	-1	-1	sweet	dessert	Jammu & Kashmir	North
253	Mawa Bati	Milk powder, dry fruits, arrowroot powder, all...	vegetarian	20	45	sweet	dessert	Madhya Pradesh	Central
254	Pinaca	Brown rice, fennel seeds, grated coconut, blac...	vegetarian	-1	-1	sweet	dessert	Goa	West

255 rows × 9 columns

```
food_by_diet = ind_food_df.groupby(by=['diet'])['ingredients'].count()
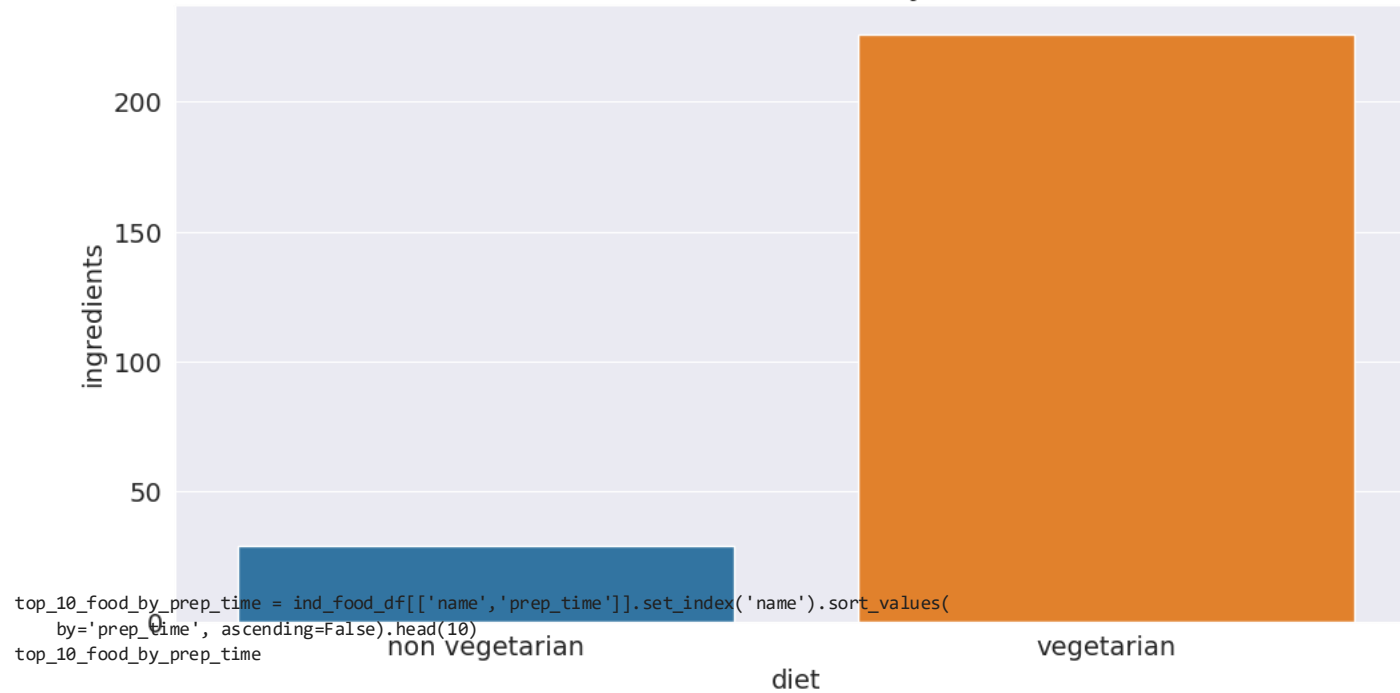```

```
food_by_diet
```

        diet

```
      non vegetarian    29
      vegetarian       226 Name:
          ingredients, dtype:
      int64
```
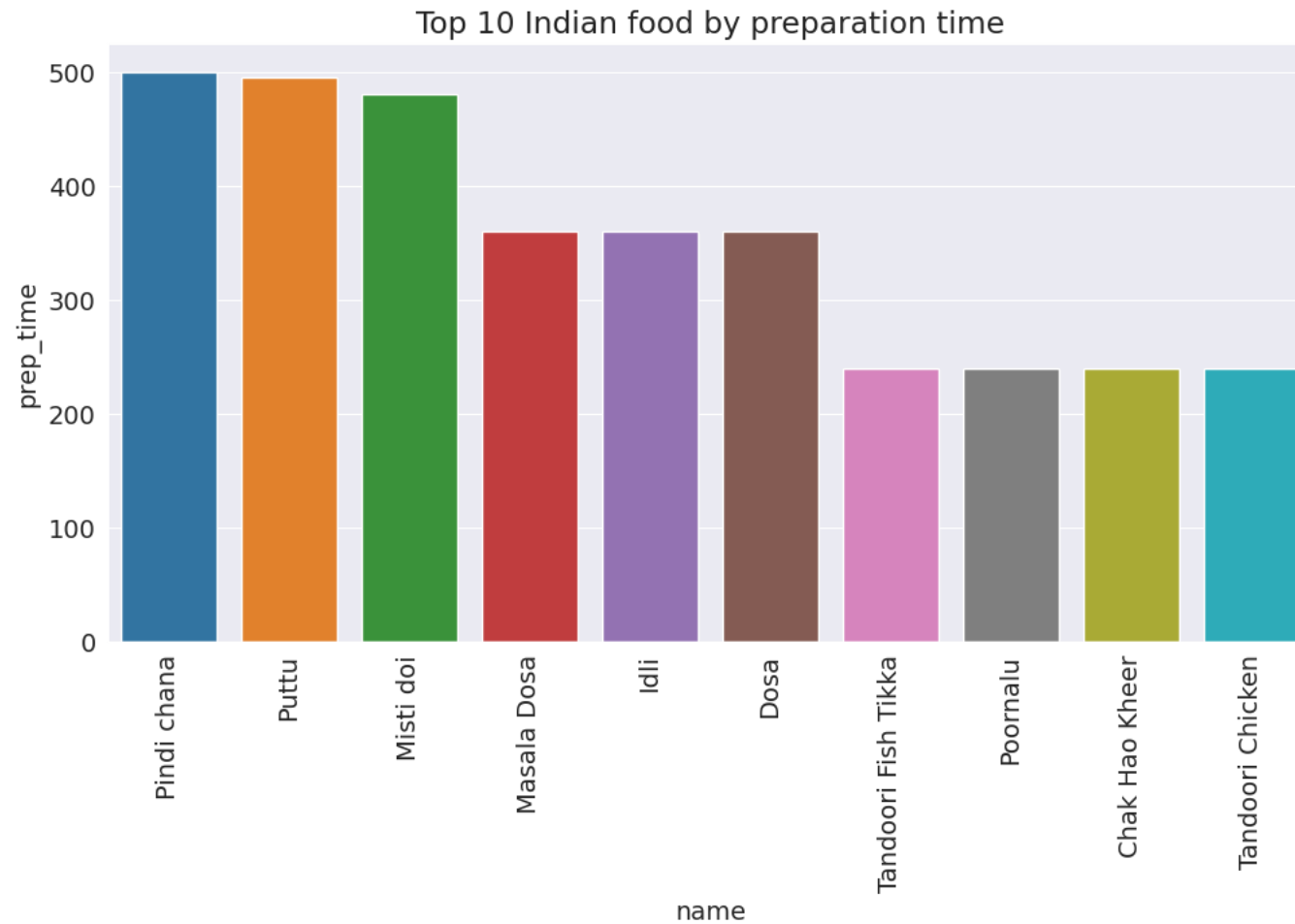
```python
plt.figure(figsize=(12,6)) plt.title('Indian food
dishes by diet')
sns.barplot(x=food_by_diet.index,
y=food_by_diet);
```

Indian food dishes by diet


```
top_10_food_by_prep_time = ind_food_df[['name','prep_time']].set_index('name').sort_values(
    by='prep_time', ascending=False).head(10)
top_10_food_by_prep_time
```

	prep_time
name	
Pindi chana	500
Puttu	495
Misti doi	480
Masala Dosa	360
Idli	360
Dosa	360
Tandoori Fish Tikka	240
Poornalu	240
Chak Hao Kheer	240
Tandoori Chicken	240

```
plt.figure(figsize=(12,6)) plt.xticks(rotation=90)
plt.title('Top 10 Indian food by preparation
time') plt.xlabel('Indian Food')
plt.ylabel('Preparation Time')
sns.barplot(x=top_10_food_by_prep_time.index,
y=top_10_food_by_prep_time.prep_time);
```

Top 10 Indian food by preparation time


```
region_count = ind_food_df.region.value_counts()
region_count

    West         87
    South        59
    North        49
    East         31
    North East   25
    Central       3
    Name: region, dtype: int64
import matplotlib.pyplot as plt fig, ax = plt.subplots(figsize=(12, 12),

subplot_kw=dict(aspect="equal"))

data = region_count.values
ingredients = region_count.index
```
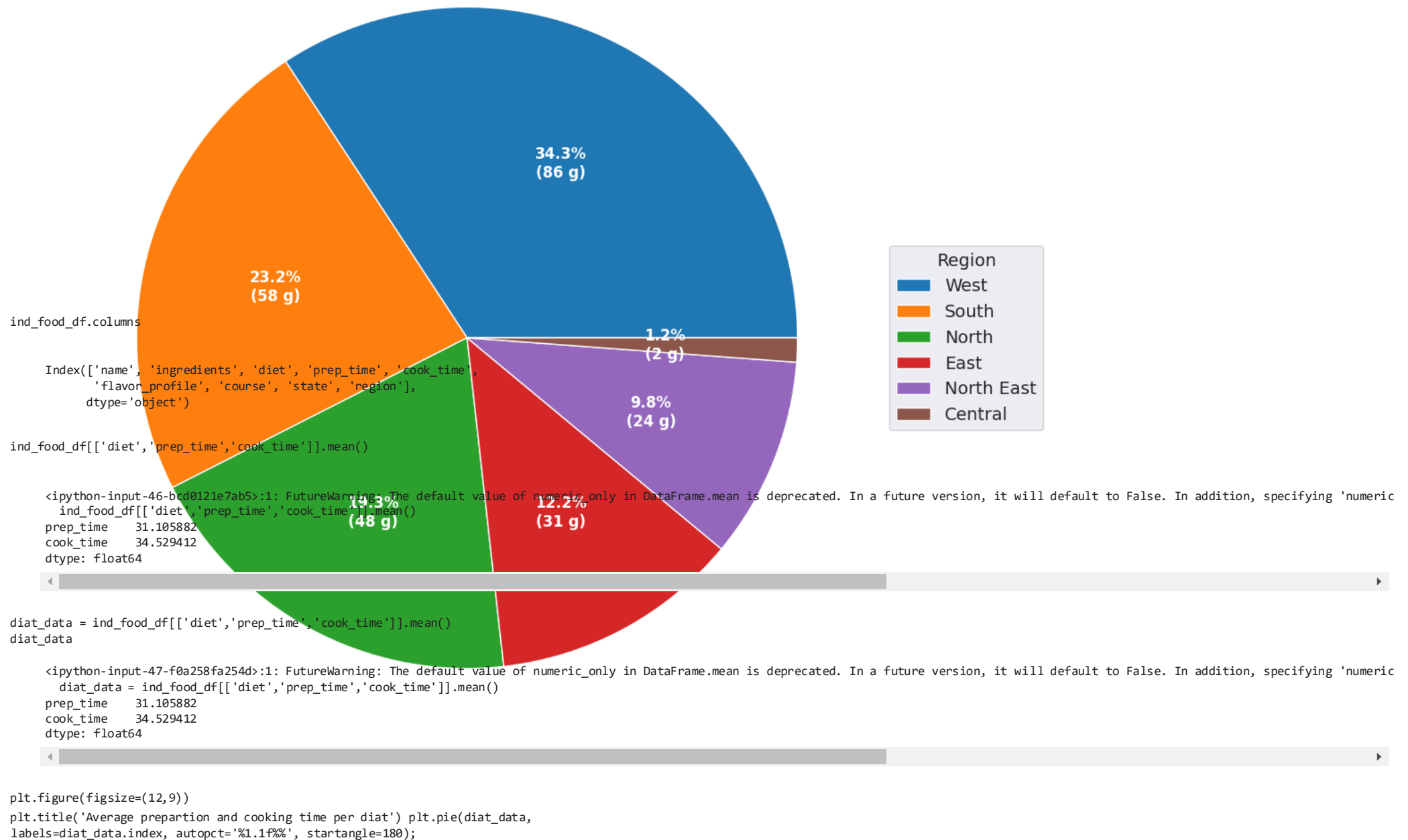
```
def func(pct, allvals):
    absolute = int(pct/100.*np.sum(allvals))
return "{:.1f}%\n({:d} g)".format(pct, absolute)


wedges, texts, autotexts = ax.pie(data, autopct=lambda pct: func(pct, region_count),
textprops=dict(color="w"))
```
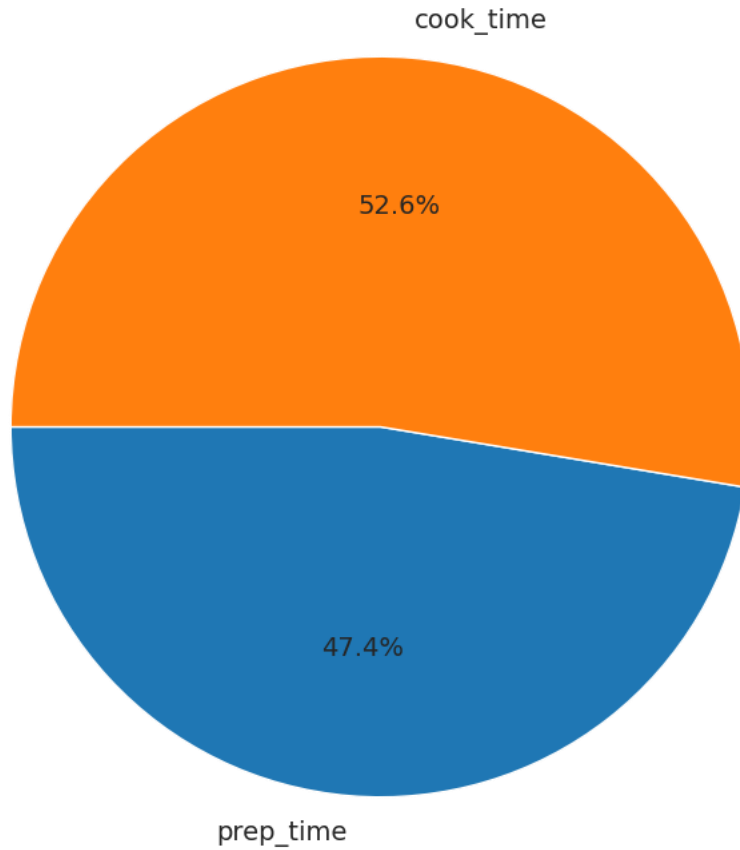
ax.legend(wedges, ingredients,   title="Region",
loc="center left",   bbox_to_anchor=(1, 0, 0.5, 1))

plt.setp(autotexts, size=12, weight="bold")

ax.set_title("Region-wise contribution") plt.show()

Region-wise contribution


```
ind_food_df.columns
```

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

```
ind_food_df[['diet','prep_time','cook_time']].mean()
```

```
<ipython-input-46-bcd0121e7ab5>:1: FutureWarning: The default value of numeric_only in DataFrame.mean is deprecated. In a future version, it will default to False. In addition, specifying 'numeric
  ind_food_df[['diet','prep_time','cook_time']].mean()
prep_time    31.105882
cook_time    34.529412
dtype: float64
```

```
diat_data = ind_food_df[['diet','prep_time','cook_time']].mean()
diat_data
```

```
<ipython-input-47-f0a258fa254d>:1: FutureWarning: The default value of numeric_only in DataFrame.mean is deprecated. In a future version, it will default to False. In addition, specifying 'numeric
  diat_data = ind_food_df[['diet','prep_time','cook_time']].mean()
prep_time    31.105882
cook_time    34.529412
dtype: float64
```

```
plt.figure(figsize=(12,9))
plt.title('Average preparation and cooking time per diat') plt.pie(diat_data,
labels=diat_data.index, autopct='%1.1f%%', startangle=180);
```

Average prepartion and cooking time per diat

cook_time


```
dish_per_flavorProfile = ind_food_df[['name','flavor_profile']]
dish_per_flavorProfile
```

	name	flavor_profile
0	Balu shahi	sweet
1	Boondi	sweet
2	Gajar ka halwa	sweet
3	Ghevar	sweet
4	Gulab jamun	sweet

```
flavorProfiles = dish_per_flavorProfile['flavor_profile'].unique()
```

	...	...	...

```
flavorProfiles
```

| 250 | Til Pitha | sweet |

```
        array(['sweet', 'spicy', 'bitter', '-1', 'sour'], dtype=object)
        251        Bebinca              sweet
Mydict = 252{}    Shufta               sweet
                                       sweet
        253        Mawa Bati            sweet
for i in flavorProfiles:
    Mydict254[i] = []Pinaca

print(255Mydict rows × 2 columns)
    for ind in
dish_per_flavorProfile.index:
    Mydict[dish_per_flavorProfile['flavor_profile'][ind]].append(dish_per_flavorProfile['name'][ind])


    {'sweet': [], 'spicy': [], 'bitter': [], '-1': [], 'sour': []}


for i in flavorProfiles:      print(i, '\n',
"-"*25, '\n', Mydict[i])

    sweet
    ------------------------
    ['Balu shahi', 'Boondi', 'Gajar ka halwa', 'Ghevar', 'Gulab jamun', 'Imarti', 'Jalebi', 'Kaju katli', 'Kalakand', 'Kheer', 'Laddu', 'Lassi', 'Nankhatai', 'Petha', 'Phirni', 'Rabri', 'Sheera', 'Si
    spicy
    ------------------------
    ['Maach Jhol', 'Pork Bharta', 'Galho', 'Aloo gobi', 'Aloo tikki', 'Aloo matar', 'Aloo shimla mirch', 'Bhatura', 'Bhindi masala', 'Biryani', 'Butter chicken', 'Chana masala', 'Chicken razala', 'Ch
    bitter
    ------------------------
    ['Aloo methi', 'Karela bharta', 'Methi na Gota', 'Muthiya']
    -1
    ------------------------
    ['Chapati', 'Naan', 'Rongi', 'Kanji', 'Pachadi', 'Paniyaram', 'Paruppu sadam', 'Puli sadam', 'Puttu', 'Sandige', 'Sevai', 'Thayir sadam', 'Theeyal', 'Bhakri', 'Copra paak', 'Dahi vada', 'Dalithoy
    sour  ------------------------
    ['Keri no ras']
```

```
state_wise_counts = ind_food_df.state.value_counts()
state_wise_counts

    Gujarat            35
    Punjab             32
    Maharashtra        30
    West Bengal        24
    -1                 24
    Assam              21
    Tamil Nadu         20
    Andhra Pradesh     10
    Uttar Pradesh       9
    Kerala              8
    Odisha              7
    Karnataka           6
    Rajasthan           6
    Telangana           5
    Bihar               3
    Goa                 3
    Manipur             2
    Jammu & Kashmir     2
```
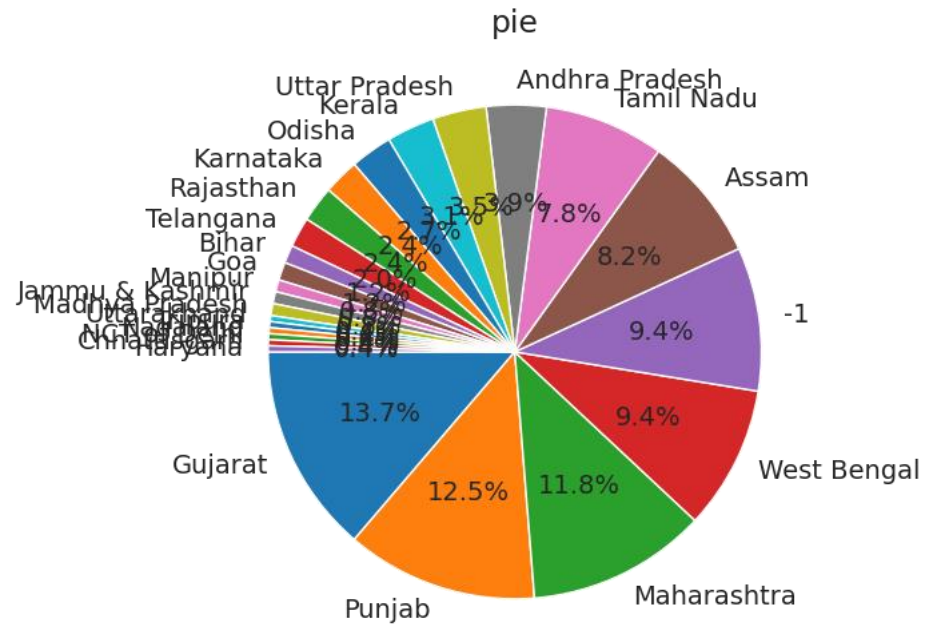
```
Madhya Pradesh     2
Uttarakhand        1
Tripura            1
Nagaland           1
NCT of Delhi       1
Chhattisgarh       1
Haryana            1
Name: state, dtype: int64
```

```python
plt.figure(figsize=(12,6)) plt.title('pie') plt.pie(state_wise_counts.values,
labels=state_wise_counts.index, autopct='%1.1f%%', startangle=180);
```



```python
sns.countplot(y=ind_food_df.state)
plt.xticks(rotation=75); plt.title('EdLevel')
plt.ylabel(None);
```

EdLevel