

```
In [16]: import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from collections import OrderedDict
import operator
train = pd.read_json('/content/drive/MyDrive/SEM3/CGAS/Assignment1/train.json')
test = pd.read_json('/content/drive/MyDrive/SEM3/CGAS/Assignment1/test.json')
# dataset = pd.concat([train,test],axis=0)
# dataset
```

Question2 part a

```
In [17]: # Find number of recipes, number of unique ingredients, number of cuisines.
# Number of recipes
print("Number of recipes : ",len(train))

# Number of cuisines
cuisines = train.cuisine.unique()

print("Number of cuisines : ", len(cuisines))

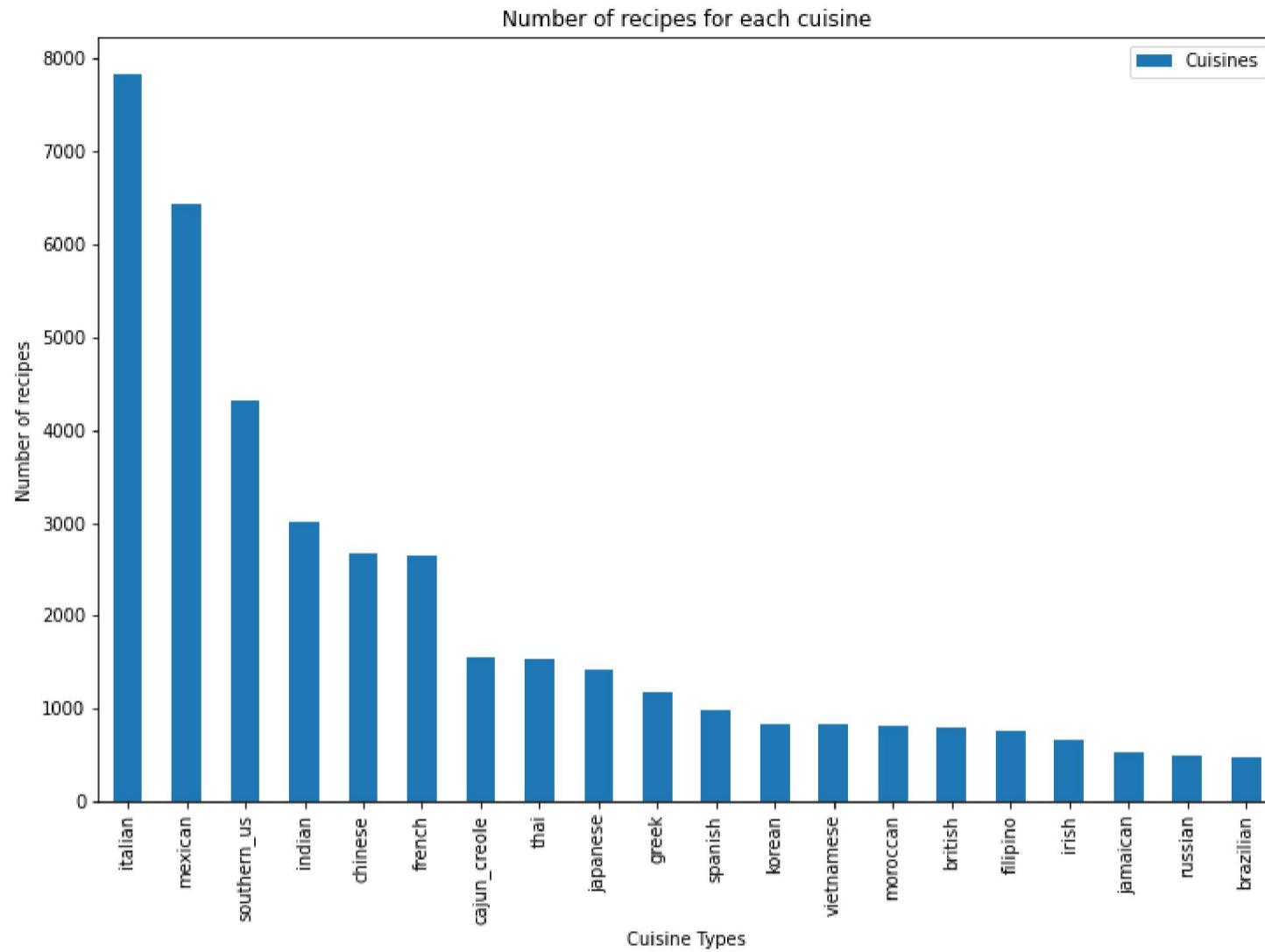
#Number of unique ingredients
# unique_ingredients = (train['ingredients'].explode().value_counts())
unique_ingre = ['garlic']
for lst in train['ingredients']:
    unique_ingre.extend(lst)
# print(len(unique_ingre))
s = set(unique_ingre)
print("Number of ingredients : ",len(s))

Number of recipes : 39774
Number of cuisines : 20
Number of ingredients : 6714
```

```
In [18]: # s
```

Question2 part b

```
In [19]: # Plot the statistics (bar plot) of number of recipes for each cuisine.  
# fig, ax = plt.subplots()  
data = train['cuisine'].explode().value_counts()  
cuisines_data = (data.keys())  
number_of_recipes = list(data.values)  
plt.figure(figsize = (12,8))  
data.plot(x = "cuisines_data", y = "number_of_recipes", kind = "bar", label = "Cuisines")  
plt.ylabel("Number of recipes")  
plt.xlabel("Cuisine Types")  
plt.title('Number of recipes for each cuisine')  
plt.legend()  
plt.show()
```



Question 2 part c

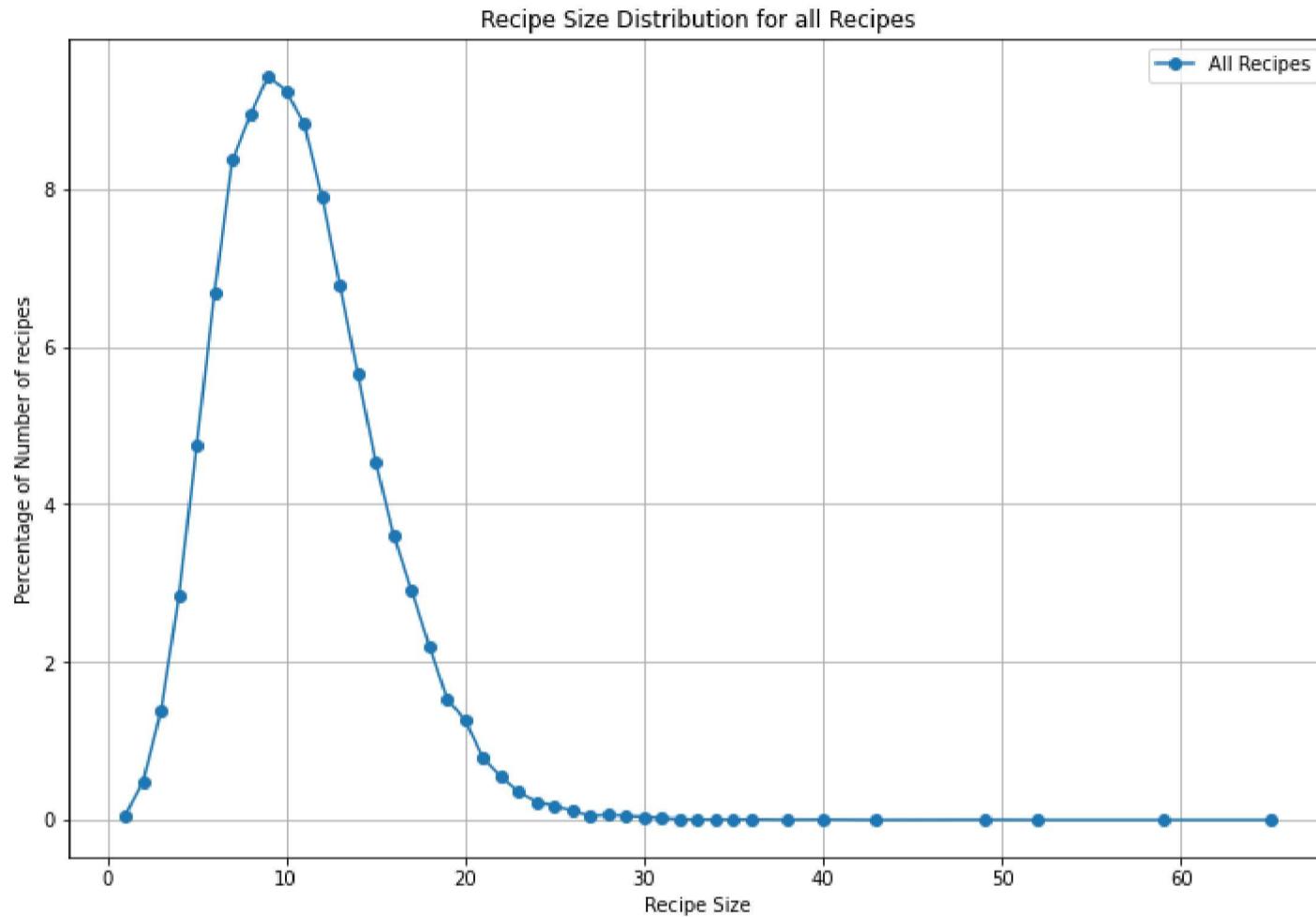
In [20]: # Plot the recipe size distribution for each cuisine as well as for all the recipes.

```
count = []
for lst in train['ingredients']:
    count.append(len(lst))

train['recipe_size'] = count
# unique_counts = (train['recipe_size'].explode().value_counts()).values
train['freq'] = ((train.groupby('recipe_size')['recipe_size'].transform('count'))/(len(train)))*100

# for all recipes
recipe_size_data = pd.Series(train.freq.values, index=train.recipe_size).to_dict()

recipe_size_data_sorted = OrderedDict(sorted(recipe_size_data.items()))
recipe_size = list(recipe_size_data_sorted.keys())
recipe_freq = list(recipe_size_data_sorted.values())
plt.figure(figsize = (12,8))
plt.plot(recipe_size, recipe_freq, marker = 'o' , label = "All Recipes")
plt.ylabel("Percentage of Number of recipes")
plt.xlabel("Recipe Size")
plt.title('Recipe Size Distribution for all Recipes')
plt.legend()
plt.grid()
plt.show()
```



In [21]: train

Out[21]:

	id	cuisine	ingredients	recipe_size	freq
0	10259	greek	[romaine lettuce, black olives, grape tomatoes...	9	9.435812
1	25693	southern_us	[plain flour, ground pepper, salt, tomatoes, g...	11	8.829889
2	20130	filipino	[eggs, pepper, salt, mayonaise, cooking oil, g...	12	7.909690
3	22213	indian	[water, vegetable oil, wheat, salt]	4	2.836024
4	13162	indian	[black pepper, shallots, cornflour, cayenne pe...	20	1.267159
...
39769	29109	irish	[light brown sugar, granulated sugar, butter, ...	12	7.909690
39770	11462	italian	[KRAFT Zesty Italian Dressing, purple onion, b...	7	8.369789
39771	2238	irish	[eggs, citrus fruit, raisins, sourdough starte...	12	7.909690
39772	41882	chinese	[boneless chicken skinless thigh, minced garli...	21	0.786946
39773	2362	mexican	[green chile, jalapeno chilies, onions, ground...	12	7.909690

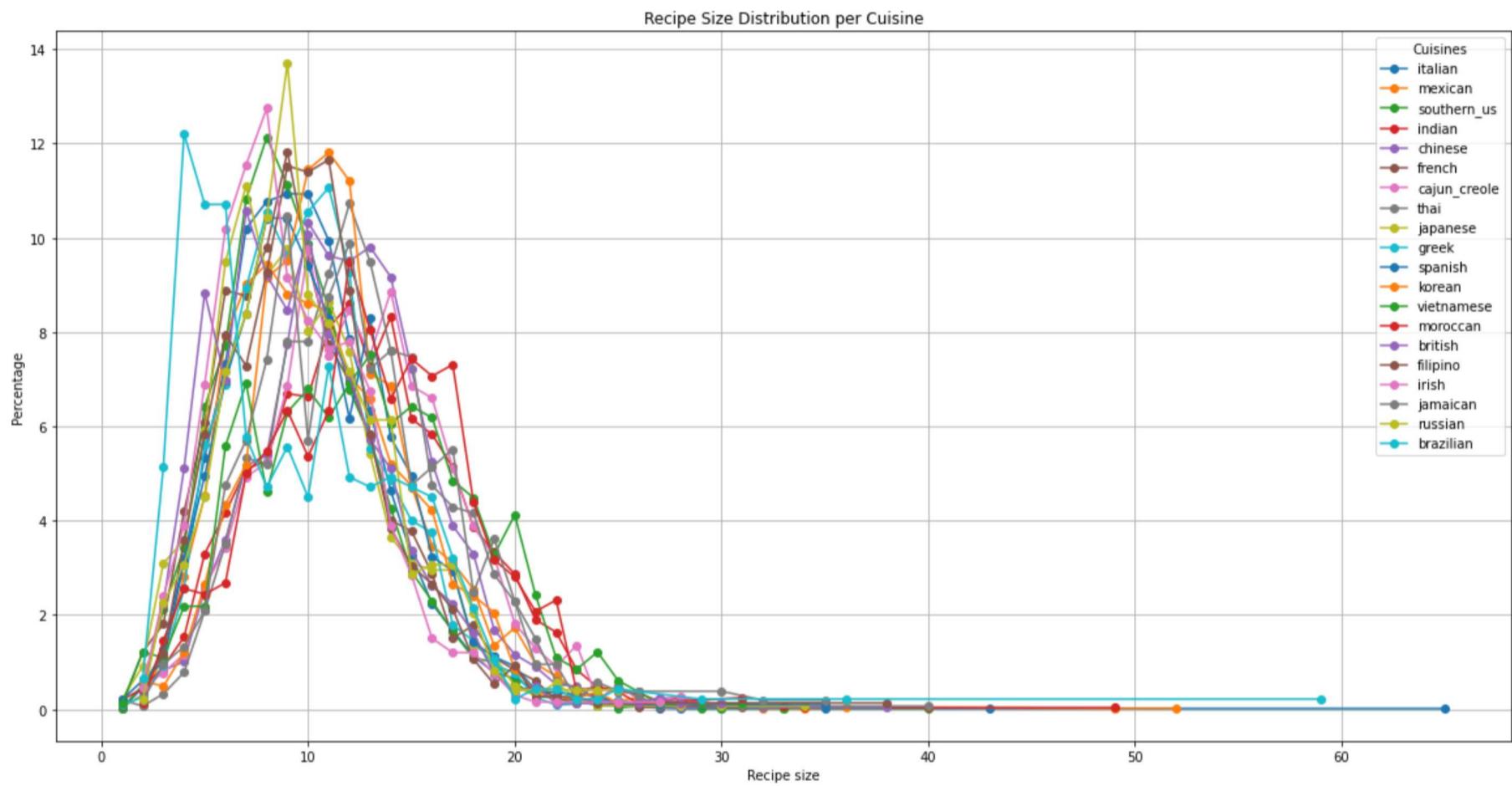
39774 rows × 5 columns

```
In [22]: # for each cuisine
plt.figure(figsize = (20,10))
all_cuisines = dict(train['cuisine'].explode().value_counts())

for i in all_cuisines:
    recipe_num_per_cuisine ={ }
    for index, row in train.iterrows():
        if(i == row['cuisine']):
            if(row['recipe_size'] in recipe_num_per_cuisine):
                recipe_num_per_cuisine[row['recipe_size']] += 1
            else:
                recipe_num_per_cuisine[row['recipe_size']] = 1

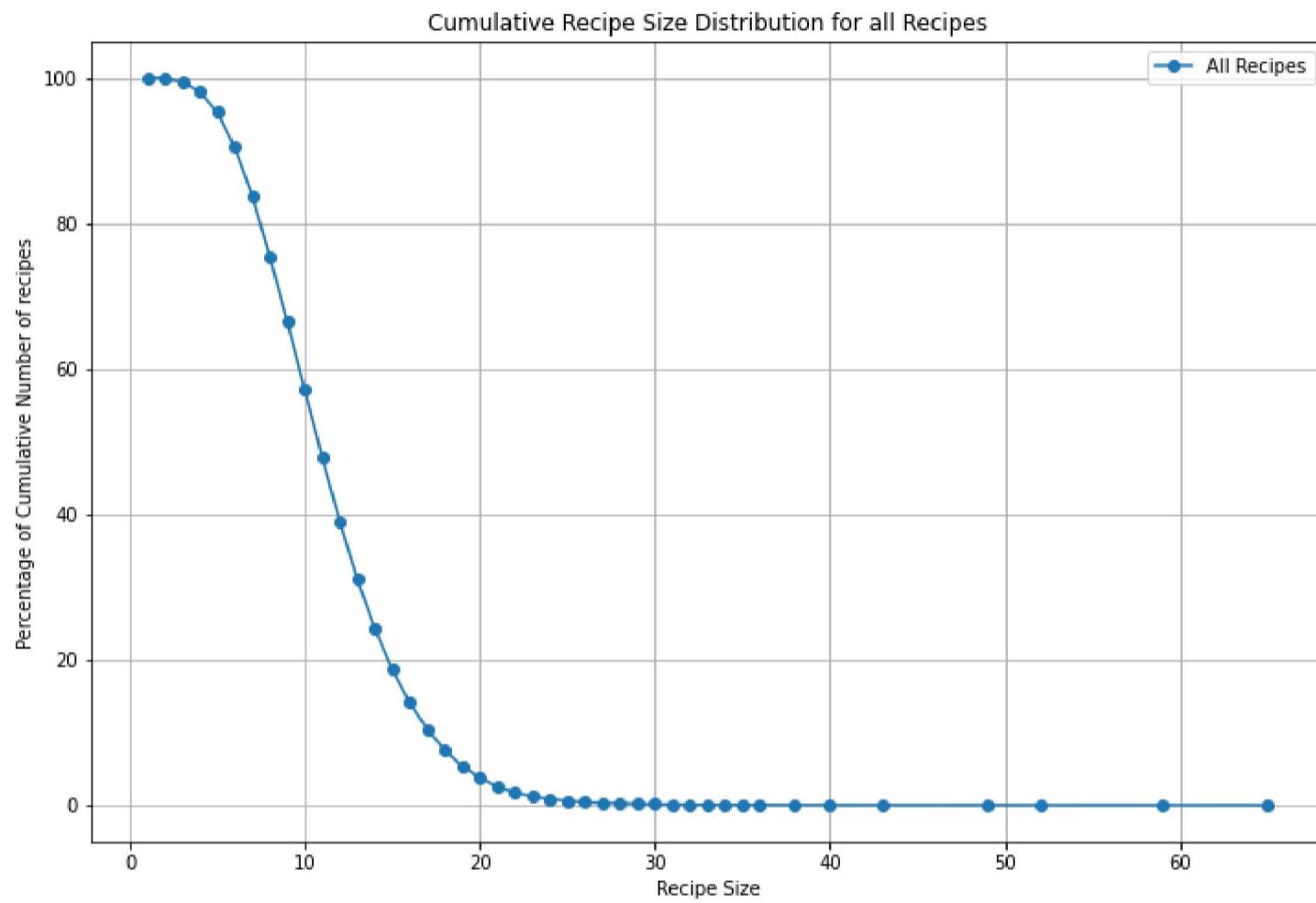
        for k in recipe_num_per_cuisine:
            recipe_num_per_cuisine[k]=(recipe_num_per_cuisine[k]/all_cuisines[i])*100
            recipe_num_per_cuisine = dict(sorted(recipe_num_per_cuisine.items()))
plt.plot(list(recipe_num_per_cuisine.keys()), list(recipe_num_per_cuisine.values()), label =i, marker = 'o')

plt.legend(title='Cuisines')
plt.xlabel('Recipe size')
plt.ylabel('Percentage')
plt.title('Recipe Size Distribution per Cuisine')
plt.grid()
plt.show()
# print(recipe_num_per_cuisine)
```



Question 2 part d

```
In [23]: # Plot cumulative distribution of recipe size and interpret.  
import operator  
sorted_d = dict( sorted(recipe_size_data.items(), key=operator.itemgetter(0),reverse=True))  
# print('Dictionary in descending order by key : ',sorted_d)  
  
recipe_size_rev = list(sorted_d.keys())  
recipe_freq_rev = list(sorted_d.values())  
# print(recipe_size_rev)  
# print(recipe_freq_rev)  
recipe_freq_cum = []  
j=0  
for i in range(len(recipe_freq_rev)):  
    j+=recipe_freq_rev[i]  
    recipe_freq_cum.append(j)  
  
plt.figure(figsize = (12,8))  
plt.plot(recipe_size_rev,recipe_freq_cum, marker = 'o', label = "All Recipes" )  
plt.ylabel("Percentage of Cumulative Number of recipes")  
plt.xlabel("Recipe Size")  
plt.title('Cumulative Recipe Size Distribution for all Recipes')  
plt.legend()  
plt.grid()  
plt.show()
```

**Question 3 part a**

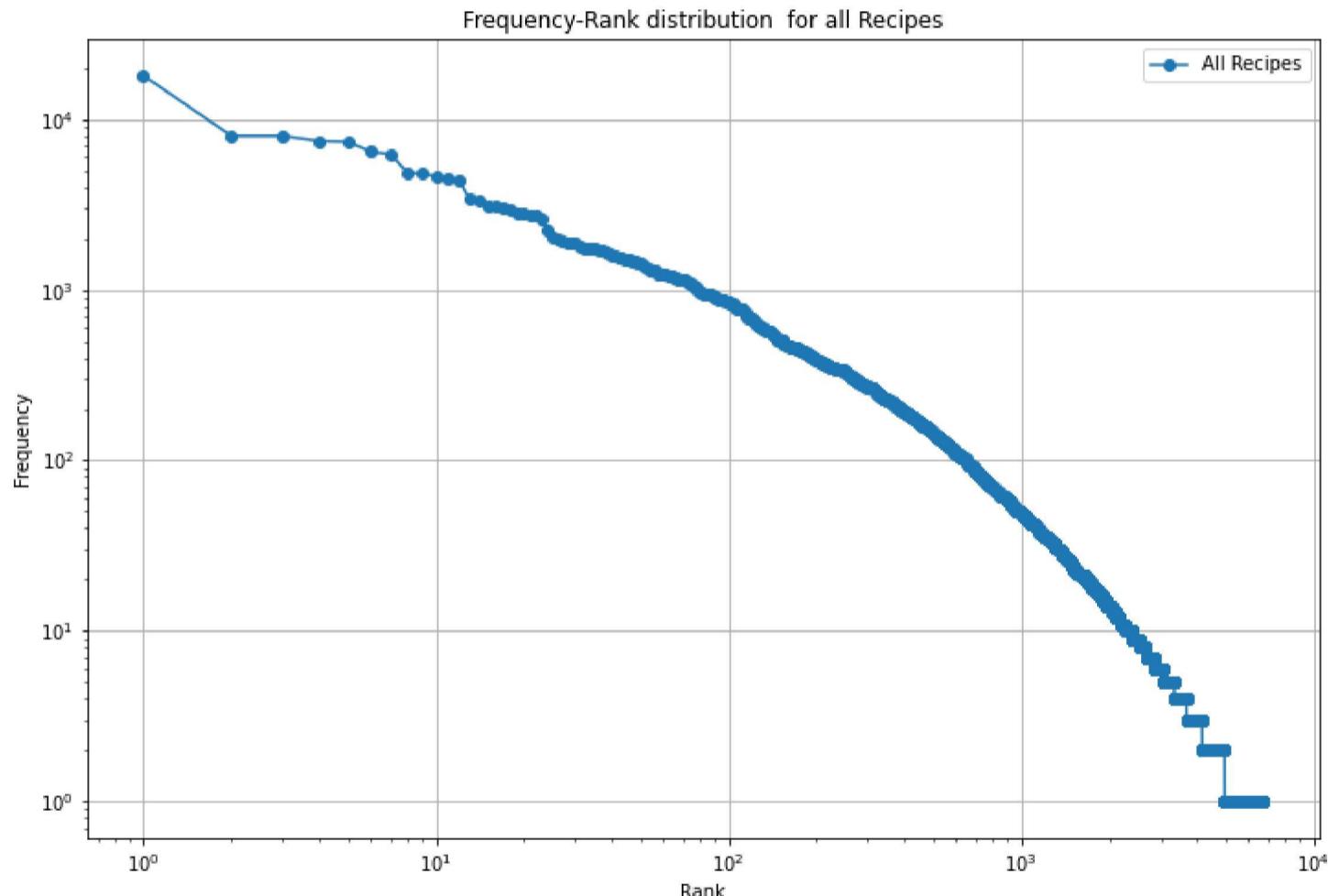
In [24]: # (a) Plot the frequency-rank distribution for all the recipes and interpret.

```
recipe_size_for_rank = pd.Series(train.recipe_size.values, index=train.id).to_dict()
# print(len(recipe_size_for_rank))

sorted_for_rank = dict( sorted(recipe_size_for_rank.items(), key=operator.itemgetter(1), reverse=True))
recipe_size_for_rank = list(sorted_for_rank.values())
recipe_id_for_rank = list(sorted_for_rank.keys())

total_ingre = []
for lst in train['ingredients']:
    total_ingre.extend(lst)
values, counts = np.unique(total_ingre, return_counts=True)
# print(type(counts))
# print(values, counts)
sorted_count = np.sort(counts)[::-1]
rank = 1
rank_lst = []
for i in range(sorted_count.shape[0]):
    rank_lst.append(rank)
    rank = rank+1

plt.figure(figsize = (12,8))
plt.loglog(rank_lst,sorted_count, marker = 'o',label ="All Recipes" )
plt.ylabel("Frequency")
plt.xlabel("Rank")
plt.title('Frequency-Rank distribution for all Recipes')
plt.legend()
plt.grid()
plt.show()
```



Question 3 part b

In [25]: # List the 10 most popular ingredients in the recipes.

```
popular_ingredients = { }

for A, B in zip(values, counts):
    popular_ingredients[A] = B

popular_ingredients_sorted = dict( sorted(popular_ingredients.items(), key=operator.itemgetter(1),reverse=True))
# print(popular_ingredients_sorted)
# first_ten = list(popular_ingredients_sorted)[:10]
# print(first_ten)
print("Top 10 Ingredients : ")
pairs_iterator = iter(popular_ingredients_sorted.items())
for i in range(0, 10):
    first_pair = next(pairs_iterator)
    print(first_pair)
```

```
Top 10 Ingredients :
('salt', 18049)
('olive oil', 7972)
('onions', 7972)
('water', 7457)
('garlic', 7380)
('sugar', 6434)
('garlic cloves', 6237)
('butter', 4848)
('ground black pepper', 4785)
('all-purpose flour', 4632)
```

Question 3 part c

```
In [29]: # Plot the ingredient-rank distribution for each of the cuisines and list the most popular ingredients for each cuisine.

plt.figure(figsize = (20,10))
for cu in all_cuisines:
    recipe_num_per_cuisine ={ }
    total_inge_cuisine =[]
    for index, row in train.iterrows():
        if(cu == row['cuisine']):

            total_inge_cuisine.extend(row['ingredients'])

    values, counts = np.unique(total_inge_cuisine, return_counts=True)
    sorted_count = np.sort(counts)[::-1]
    normalised_sorted_count = sorted_count/sorted_count[0]
    rank =1
    rank_lst = []
    for i in range(sorted_count.shape[0]):
        rank_lst.append(rank)
        rank = rank+1

    for A, B in zip(values, counts):
        popular_ingredients[A] = B

    popular_ingredients_sorted = dict( sorted(popular_ingredients.items(), key=operator.itemgetter(1),reverse=True))
    pairs_iterator = iter(popular_ingredients_sorted.items())
    # print("Number of ingredients used in ", cu , "cuisine are : ", len(popular_ingredients_sorted) )
    for i in range(0, 10):
        first_pair = next(pairs_iterator)
        print("most popular ingredient ", i+1 , "for cuisine" , cu , " is : ",first_pair)
    print("\n")

    plt.loglog(rank_lst,normalised_sorted_count, marker = 'o', label = cu, markersize = 2 )
    # plt.plot(rank_lst,sorted_count)
    plt.legend(title = 'Cuisines')

    plt.grid()
    plt.ylabel("Frequency")
    plt.xlabel("Rank")
    plt.title('Frequency-Rank distribution cuisine wise')

plt.show()
```

```
most popular ingredient 1 for cuisine italian is : ('salt', 3454)
most popular ingredient 2 for cuisine italian is : ('olive oil', 3111)
most popular ingredient 3 for cuisine italian is : ('garlic cloves', 1619)
most popular ingredient 4 for cuisine italian is : ('grated parmesan cheese', 1580)
most popular ingredient 5 for cuisine italian is : ('garlic', 1471)
most popular ingredient 6 for cuisine italian is : ('ground black pepper', 1444)
most popular ingredient 7 for cuisine italian is : ('extra-virgin olive oil', 1362)
most popular ingredient 8 for cuisine italian is : ('onions', 1240)
most popular ingredient 9 for cuisine italian is : ('water', 1052)
most popular ingredient 10 for cuisine italian is : ('butter', 1030)
```

```
most popular ingredient 1 for cuisine mexican is : ('salt', 2720)
most popular ingredient 2 for cuisine mexican is : ('onions', 1493)
most popular ingredient 3 for cuisine mexican is : ('ground cumin', 1346)
most popular ingredient 4 for cuisine mexican is : ('garlic', 1317)
most popular ingredient 5 for cuisine mexican is : ('olive oil', 1289)
most popular ingredient 6 for cuisine mexican is : ('chili powder', 1236)
most popular ingredient 7 for cuisine mexican is : ('jalapeno chilies', 1146)
most popular ingredient 8 for cuisine mexican is : ('sour cream', 1076)
most popular ingredient 9 for cuisine mexican is : ('avocado', 1044)
most popular ingredient 10 for cuisine mexican is : ('corn tortillas', 946)
```

```
most popular ingredient 1 for cuisine southern_us is : ('salt', 2290)
most popular ingredient 2 for cuisine southern_us is : ('butter', 1255)
most popular ingredient 3 for cuisine southern_us is : ('all-purpose flour', 1222)
most popular ingredient 4 for cuisine southern_us is : ('sugar', 1054)
most popular ingredient 5 for cuisine southern_us is : ('large eggs', 746)
most popular ingredient 6 for cuisine southern_us is : ('baking powder', 729)
most popular ingredient 7 for cuisine southern_us is : ('water', 686)
most popular ingredient 8 for cuisine southern_us is : ('unsalted butter', 655)
most popular ingredient 9 for cuisine southern_us is : ('milk', 645)
most popular ingredient 10 for cuisine southern_us is : ('buttermilk', 634)
```

```
most popular ingredient 1 for cuisine indian is : ('salt', 1934)
most popular ingredient 2 for cuisine indian is : ('onions', 1195)
most popular ingredient 3 for cuisine indian is : ('garam masala', 862)
most popular ingredient 4 for cuisine indian is : ('water', 820)
most popular ingredient 5 for cuisine indian is : ('ground turmeric', 728)
most popular ingredient 6 for cuisine indian is : ('garlic', 726)
most popular ingredient 7 for cuisine indian is : ('cumin seed', 697)
most popular ingredient 8 for cuisine indian is : ('ground cumin', 683)
most popular ingredient 9 for cuisine indian is : ('vegetable oil', 593)
most popular ingredient 10 for cuisine indian is : ('oil', 546)
```

```
most popular ingredient 1 for cuisine chinese is : ('soy sauce', 1363)
most popular ingredient 2 for cuisine chinese is : ('sesame oil', 915)
most popular ingredient 3 for cuisine chinese is : ('salt', 907)
most popular ingredient 4 for cuisine chinese is : ('corn starch', 906)
most popular ingredient 5 for cuisine chinese is : ('sugar', 824)
most popular ingredient 6 for cuisine chinese is : ('garlic', 763)
most popular ingredient 7 for cuisine chinese is : ('water', 762)
most popular ingredient 8 for cuisine chinese is : ('green onions', 628)
most popular ingredient 9 for cuisine chinese is : ('vegetable oil', 602)
most popular ingredient 10 for cuisine chinese is : ('scallions', 591)
```

```
most popular ingredient 1 for cuisine french is : ('salt', 1203)
most popular ingredient 2 for cuisine french is : ('sugar', 637)
most popular ingredient 3 for cuisine french is : ('all-purpose flour', 593)
most popular ingredient 4 for cuisine french is : ('unsalted butter', 592)
most popular ingredient 5 for cuisine french is : ('olive oil', 516)
most popular ingredient 6 for cuisine french is : ('butter', 514)
most popular ingredient 7 for cuisine french is : ('water', 439)
most popular ingredient 8 for cuisine french is : ('large eggs', 415)
most popular ingredient 9 for cuisine french is : ('garlic cloves', 403)
most popular ingredient 10 for cuisine french is : ('ground black pepper', 385)
```

```
most popular ingredient 1 for cuisine cajun_creole is : ('salt', 743)
most popular ingredient 2 for cuisine cajun_creole is : ('onions', 529)
most popular ingredient 3 for cuisine cajun_creole is : ('garlic', 370)
most popular ingredient 4 for cuisine cajun_creole is : ('green bell pepper', 336)
most popular ingredient 5 for cuisine cajun_creole is : ('butter', 334)
most popular ingredient 6 for cuisine cajun_creole is : ('oyster sauce', 333)
most popular ingredient 7 for cuisine cajun_creole is : ('olive oil', 316)
most popular ingredient 8 for cuisine cajun_creole is : ('cayenne pepper', 297)
most popular ingredient 9 for cuisine cajun_creole is : ('cajun seasoning', 293)
most popular ingredient 10 for cuisine cajun_creole is : ('all-purpose flour', 291)
```

```
most popular ingredient 1 for cuisine thai is : ('fish sauce', 625)
most popular ingredient 2 for cuisine thai is : ('garlic', 414)
most popular ingredient 3 for cuisine thai is : ('salt', 396)
most popular ingredient 4 for cuisine thai is : ('coconut milk', 353)
```

```
most popular ingredient 5 for cuisine thai is : ('vegetable oil', 335)
most popular ingredient 6 for cuisine thai is : ('soy sauce', 332)
most popular ingredient 7 for cuisine thai is : ('sugar', 330)
most popular ingredient 8 for cuisine thai is : ('water', 310)
most popular ingredient 9 for cuisine thai is : ('garlic cloves', 299)
most popular ingredient 10 for cuisine thai is : ('cajun seasoning', 293)
```

```
most popular ingredient 1 for cuisine japanese is : ('soy sauce', 561)
most popular ingredient 2 for cuisine japanese is : ('salt', 422)
most popular ingredient 3 for cuisine japanese is : ('mirin', 402)
most popular ingredient 4 for cuisine japanese is : ('sugar', 401)
most popular ingredient 5 for cuisine japanese is : ('water', 383)
most popular ingredient 6 for cuisine japanese is : ('cajun seasoning', 293)
most popular ingredient 7 for cuisine japanese is : ('sake', 289)
most popular ingredient 8 for cuisine japanese is : ('rice vinegar', 261)
most popular ingredient 9 for cuisine japanese is : ('refried beans', 250)
most popular ingredient 10 for cuisine japanese is : ('vegetable oil', 245)
```

```
most popular ingredient 1 for cuisine greek is : ('salt', 572)
most popular ingredient 2 for cuisine greek is : ('olive oil', 504)
most popular ingredient 3 for cuisine greek is : ('mirin', 402)
most popular ingredient 4 for cuisine greek is : ('cajun seasoning', 293)
most popular ingredient 5 for cuisine greek is : ('sake', 289)
most popular ingredient 6 for cuisine greek is : ('dried oregano', 267)
most popular ingredient 7 for cuisine greek is : ('garlic cloves', 254)
most popular ingredient 8 for cuisine greek is : ('feta cheese crumbles', 252)
most popular ingredient 9 for cuisine greek is : ('refried beans', 250)
most popular ingredient 10 for cuisine greek is : ('extra-virgin olive oil', 229)
```

```
most popular ingredient 1 for cuisine spanish is : ('salt', 460)
most popular ingredient 2 for cuisine spanish is : ('mirin', 402)
most popular ingredient 3 for cuisine spanish is : ('olive oil', 387)
most popular ingredient 4 for cuisine spanish is : ('cajun seasoning', 293)
most popular ingredient 5 for cuisine spanish is : ('garlic cloves', 290)
most popular ingredient 6 for cuisine spanish is : ('sake', 289)
most popular ingredient 7 for cuisine spanish is : ('extra-virgin olive oil', 255)
most popular ingredient 8 for cuisine spanish is : ('onions', 253)
most popular ingredient 9 for cuisine spanish is : ('refried beans', 250)
most popular ingredient 10 for cuisine spanish is : ('sesame oil', 186)
```

```
most popular ingredient 1 for cuisine korean is : ('soy sauce', 427)
most popular ingredient 2 for cuisine korean is : ('sesame oil', 403)
most popular ingredient 3 for cuisine korean is : ('garlic', 303)
most popular ingredient 4 for cuisine korean is : ('cajun seasoning', 293)
most popular ingredient 5 for cuisine korean is : ('green onions', 293)
most popular ingredient 6 for cuisine korean is : ('sugar', 266)
most popular ingredient 7 for cuisine korean is : ('salt', 253)
most popular ingredient 8 for cuisine korean is : ('refried beans', 250)
most popular ingredient 9 for cuisine korean is : ('water', 242)
most popular ingredient 10 for cuisine korean is : ('sesame seeds', 223)
```

```
most popular ingredient 1 for cuisine vietnamese is : ('fish sauce', 392)
most popular ingredient 2 for cuisine vietnamese is : ('sugar', 344)
most popular ingredient 3 for cuisine vietnamese is : ('cajun seasoning', 293)
most popular ingredient 4 for cuisine vietnamese is : ('salt', 264)
most popular ingredient 5 for cuisine vietnamese is : ('refried beans', 250)
most popular ingredient 6 for cuisine vietnamese is : ('garlic', 239)
most popular ingredient 7 for cuisine vietnamese is : ('water', 227)
most popular ingredient 8 for cuisine vietnamese is : ('carrots', 196)
most popular ingredient 9 for cuisine vietnamese is : ('taco seasoning mix', 181)
most popular ingredient 10 for cuisine vietnamese is : ('soy sauce', 155)
```

```
most popular ingredient 1 for cuisine moroccan is : ('salt', 413)
most popular ingredient 2 for cuisine moroccan is : ('olive oil', 412)
most popular ingredient 3 for cuisine moroccan is : ('fish sauce', 392)
most popular ingredient 4 for cuisine moroccan is : ('ground cumin', 348)
most popular ingredient 5 for cuisine moroccan is : ('cajun seasoning', 293)
most popular ingredient 6 for cuisine moroccan is : ('onions', 280)
most popular ingredient 7 for cuisine moroccan is : ('refried beans', 250)
most popular ingredient 8 for cuisine moroccan is : ('garlic cloves', 223)
most popular ingredient 9 for cuisine moroccan is : ('ground cinnamon', 223)
most popular ingredient 10 for cuisine moroccan is : ('water', 182)
```

```
most popular ingredient 1 for cuisine british is : ('salt', 407)
most popular ingredient 2 for cuisine british is : ('fish sauce', 392)
most popular ingredient 3 for cuisine british is : ('cajun seasoning', 293)
most popular ingredient 4 for cuisine british is : ('refried beans', 250)
most popular ingredient 5 for cuisine british is : ('all-purpose flour', 238)
most popular ingredient 6 for cuisine british is : ('butter', 222)
most popular ingredient 7 for cuisine british is : ('milk', 202)
most popular ingredient 8 for cuisine british is : ('eggs', 191)
```

```
most popular ingredient 9 for cuisine british is : ('unsalted butter', 191)
most popular ingredient 10 for cuisine british is : ('taco seasoning mix', 181)
```

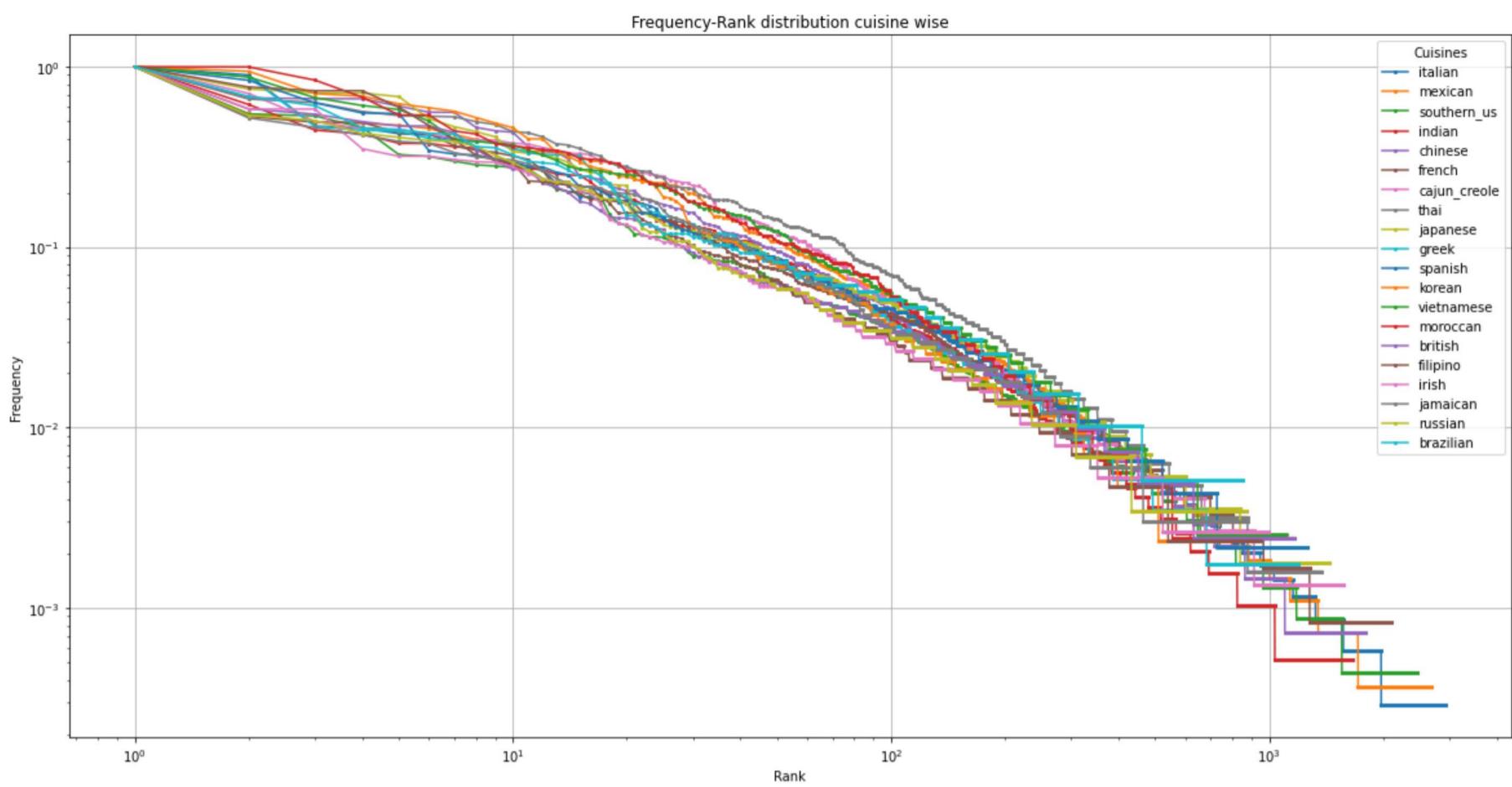
```
most popular ingredient 1 for cuisine filipino is : ('salt', 421)
most popular ingredient 2 for cuisine filipino is : ('garlic', 325)
most popular ingredient 3 for cuisine filipino is : ('onions', 310)
most popular ingredient 4 for cuisine filipino is : ('water', 310)
most popular ingredient 5 for cuisine filipino is : ('cajun seasoning', 293)
most popular ingredient 6 for cuisine filipino is : ('soy sauce', 251)
most popular ingredient 7 for cuisine filipino is : ('refried beans', 250)
most popular ingredient 8 for cuisine filipino is : ('pepper', 199)
most popular ingredient 9 for cuisine filipino is : ('taco seasoning mix', 181)
most popular ingredient 10 for cuisine filipino is : ('oil', 166)
```

```
most popular ingredient 1 for cuisine irish is : ('salt', 376)
most popular ingredient 2 for cuisine irish is : ('cajun seasoning', 293)
most popular ingredient 3 for cuisine irish is : ('refried beans', 250)
most popular ingredient 4 for cuisine irish is : ('all-purpose flour', 219)
most popular ingredient 5 for cuisine irish is : ('butter', 219)
most popular ingredient 6 for cuisine irish is : ('taco seasoning mix', 181)
most popular ingredient 7 for cuisine irish is : ('couscous', 142)
most popular ingredient 8 for cuisine irish is : ('onions', 132)
most popular ingredient 9 for cuisine irish is : ('potatoes', 120)
most popular ingredient 10 for cuisine irish is : ('sugar', 120)
```

```
most popular ingredient 1 for cuisine jamaican is : ('salt', 332)
most popular ingredient 2 for cuisine jamaican is : ('cajun seasoning', 293)
most popular ingredient 3 for cuisine jamaican is : ('refried beans', 250)
most popular ingredient 4 for cuisine jamaican is : ('taco seasoning mix', 181)
most popular ingredient 5 for cuisine jamaican is : ('onions', 173)
most popular ingredient 6 for cuisine jamaican is : ('water', 153)
most popular ingredient 7 for cuisine jamaican is : ('couscous', 142)
most popular ingredient 8 for cuisine jamaican is : ('garlic', 139)
most popular ingredient 9 for cuisine jamaican is : ('ground allspice', 128)
most popular ingredient 10 for cuisine jamaican is : ('pepper', 125)
```

```
most popular ingredient 1 for cuisine russian is : ('cajun seasoning', 293)
most popular ingredient 2 for cuisine russian is : ('salt', 288)
most popular ingredient 3 for cuisine russian is : ('refried beans', 250)
most popular ingredient 4 for cuisine russian is : ('taco seasoning mix', 181)
most popular ingredient 5 for cuisine russian is : ('sugar', 155)
most popular ingredient 6 for cuisine russian is : ('onions', 145)
most popular ingredient 7 for cuisine russian is : ('couscous', 142)
most popular ingredient 8 for cuisine russian is : ('all-purpose flour', 123)
most popular ingredient 9 for cuisine russian is : ('sour cream', 117)
most popular ingredient 10 for cuisine russian is : ('eggs', 112)
```

```
most popular ingredient 1 for cuisine brazilian is : ('cajun seasoning', 293)
most popular ingredient 2 for cuisine brazilian is : ('refried beans', 250)
most popular ingredient 3 for cuisine brazilian is : ('salt', 194)
most popular ingredient 4 for cuisine brazilian is : ('taco seasoning mix', 181)
most popular ingredient 5 for cuisine brazilian is : ('couscous', 142)
most popular ingredient 6 for cuisine brazilian is : ('onions', 133)
most popular ingredient 7 for cuisine brazilian is : ('olive oil', 118)
most popular ingredient 8 for cuisine brazilian is : ('red curry paste', 111)
most popular ingredient 9 for cuisine brazilian is : ('lime', 89)
most popular ingredient 10 for cuisine brazilian is : ('water', 87)
```



In [28]:

```
%%shell  
jupyter nbconvert --to html /content/drive/MyDrive/SEM3/CGAS/Assignment1/CGAS_A1.ipynb
```

```
[NbConvertApp] Converting notebook /content/drive/MyDrive/SEM3/CGAS/Assignment1/CGAS_A1.ipynb to html  
[NbConvertApp] Writing 829882 bytes to /content/drive/MyDrive/SEM3/CGAS/Assignment1/CGAS_A1.html
```

Out[28]: