

```
import pandas as pd
dataset = pd.read_excel("final450.xlsx")
```

```
pont1 = {0: [['robot', 'LAPTOP#GENERAL', 'liked', 'positive']], 1: [['robot Relay', 'LAPTOP#GENERAL', 'cute', 'positive']], 2: [['Delivery Robot', 'enjoyed', 'positive']], 3: [['robot', 'LAPTOP#GENERAL', 'cool', 'positive']], 4: [['Relay', 'SERVICE#GENERAL', 'NULL', 'positive']], 5: [['AMBIECNE#GENERAL', 'coolest', 'positive']], 6: [['Relay the Robot', 'LAPTOP#GENERAL', 'NULL', 'positive']], 7: [['robot', 'LAPTOP#GENERAL', 'NULL', 'positive']], 8: [['robot server', 'SERVICE#GENERAL', 'adorable', 'positive']], 9: [['welcome letter', 'personalized', 'positive']], 10: [['cleaning staff', 'SERVICE#GENERAL', 'nice', 'positive']], 11: [['survey robot', 'SERVICE#GENERAL', 'cute', 'positive rooms', 'AMBIENCE#GENERAL', 'clean and comfortable', 'positive']], 12: [['friendly', 'friendly', 'positive']], 13: [[''friendly', 'friendly', 'positive']], 14: [['Relay the Robot', 'LAPTOP#GENERAL', 'NULL', 'positive']], 15: [['4 foot robot', 'LAPTOP#DESIGN_FEATURES', 'cutest', 'positive']], 16: [['hotel robot', 'loved', 'positive']], 17: [['Robot', 'LAPTOP#GENERAL', 'NULL', 'positive']], 18: [['front desk team', 'SERVICE#GENERAL', 'warm welcome', 'robot', 'SERVICE#GENERAL', 'little hello', 'positive']], 19: [['robot', 'SERVICE#GENERAL', 'positive']], 20: [['delivery robot', 'SERVICE#GENERAL', 'hit', 'positive']], 21: [['delivery robot', 'SERVICE#GENERAL', 'happy', 'positive']], 22: [['LAPTOP#GENERAL', 'relay', 'positive']], 23: [['staff', 'SERVICE#GENERAL', 'glad', 'positive']], 24: [['room', 'AMBIENCE#GENERAL', 'glad', 'positive options', 'FOOD#QUALITY', 'glad', 'positive']], 25: [['Delivery Robot, Relay', 'SERVICE#GENERAL', 'glad', 'positive']], 26: [[''friendly', 'positive']], 27: [['Relay the Robot', 'SERVICE#GENERAL', 'glad', 'positive']], 28: [['front desk team', 'SERVICE#GENERAL', 'warm welcome', 'robot', 'SERVICE#GENERAL', 'little hello', 'positive']], 29: [['Robot', 'LAPTOP#GENERAL', 'NULL', 'positive']], 30: [[''friendly', 'friendly', 'positive']], 31: [[''friendly', 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```



```
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'positive']], 435: [['hotel robot', 'LAPTOP#GENERAL', 'NULL', 'positive']], 436: [['hotel robot', 'LAPTOP#GENERAL', 'NULL', 'positive']]}}
```

```
pos = {}
neg = {}
neu = {}

for x in pont1:
    for j in pont1[x]:
        if (j is None or j == []):
            continue

        if (len(j[2]) > 3 and j[3] == "positive"):
            if (j[2] in pos):
                pos[j[2]] +=1
            else:
                pos[j[2]] = 1

        elif (len(j[2]) > 3 and j[3] == "negative"):
            if (j[2] in neg):
                neg[j[2]] +=1
            else:
                neg[j[2]] = 1

        elif (len(j[2]) > 3 and j[3] == "neutral"):
            if (j[2] in neu):
                neu[j[2]] +=1
            else:
                neu[j[2]] = 1
```

```
pos
→ {'liked': 1,
 'cute': 2,
 'enjoyed': 4,
 'cool': 1,
 'NULL': 380,
 'coolest': 2,
 'adorable': 1,
 'personalized': 1,
 'nice': 1,
 'clean and comfortable': 1,
 'friendly': 6,
 'impressive': 1,
```

```
'cutest': 1,
'loved': 1,
'enjoy': 1,
'Impressed': 8,
'warm welcome': 1,
'little hello': 1,
'happy': 1,
'relay': 1,
'glad': 5,
'clean': 1,
'lovely': 3,
'great': 10,
'awesome': 1,
'friendly and receptive': 1,
'well maintained and clean': 1,
'cute noises': 1,
'delivered': 1,
'good': 1,
'little': 1,
'unusual': 1,
'spacious': 1,
'comfortable': 1,
'full': 1,
'cheese': 1,
'free': 1,
'delighted': 1,
'favorite': 1,
'deliver store purchases': 1,
'innovative': 1}
```

neg

{'NULL': 3, 'Neat': 1}

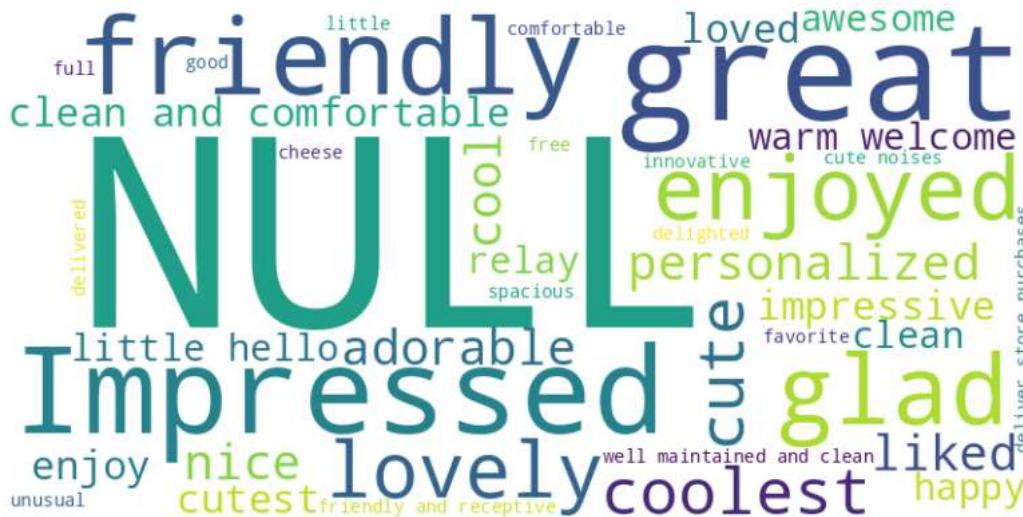
neu

{}

```
from wordcloud import WordCloud
import matplotlib.pyplot as plt
```

```
# Generate a word cloud from the word frequencies
wordcloud = WordCloud(width=800, height=400, background_color='white').generate_from_frequencies(pos)

# Display the word cloud using matplotlib
plt.figure(figsize=(10, 5))
plt.imshow(wordcloud, interpolation='bilinear')
plt.axis("off")
plt.show()
```



```
# Generate a word cloud from the word frequencies
wordcloud = WordCloud(width=800, height=400, background_color='white').generate_from_frequencies(neg)
```

```
# Display the word cloud using matplotlib
plt.figure(figsize=(10, 5))
plt.imshow(wordcloud, interpolation='bilinear')
plt.axis("off")
plt.show()
```



```
dataset.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6644 entries, 0 to 6643
Data columns (total 26 columns):
 #   Column           Non-Null Count  Dtype  
 --- 
 0   Unnamed: 0.1    6644 non-null    int64  
 1   Unnamed: 0      6644 non-null    int64  
 2   Hotel Name     6642 non-null    object  
 3   Reviews        6642 non-null    object  
 4   Function       6642 non-null    object  
 5   label          6642 non-null    object  
 6   Sentiment score 6642 non-null    float64 
 7   mind perception 6643 non-null    object  
 8   Butler         6643 non-null    float64 
 9   Delivering items to rooms 6643 non-null    float64 
 10  Cooking        6643 non-null    float64 
 11  Dancing        6643 non-null    float64 
 12  Delivering Food 6643 non-null    float64 
 13  Waiter         6643 non-null    float64 
 14  Dinosaur Robots 6643 non-null    float64 
 15  Manufacturing cars 6643 non-null    float64 
 16  Interacting with customers 6643 non-null    float64 
 17  Luggage Storage 6643 non-null    float64 
 18  Making drinks   6643 non-null    float64 
 19  robo chair machine 6643 non-null    float64 
 20  display museum   6643 non-null    float64 
 21  kids entertainment 6643 non-null    float64 
 22  Dance           6643 non-null    float64 
 23  Taking Order    6643 non-null    float64 
 24  Performances    6643 non-null    float64 
 25  Triplet          6644 non-null    object  
dtypes: float64(18), int64(2), object(6)
memory usage: 1.3+ MB
```

```
x = {i:[0,0] for i in dataset.loc[:, "Function"]}
```

```
x
```

```
{'bring amenities': [0, 0],
 'Butler , Delivering items to rooms': [0, 0],
 'Cooking , Delivering items to room': [0, 0],
 'Dancing ': [0, 0],
 'delivering food to table': [0, 0],
 'Delivering items to room': [0, 0],
 'Delivery , Waiter': [0, 0],
 'dinosaur robots': [0, 0],
 'Helping in maufacturing of cars': [0, 0],
```

```
'Interacting with customers at reception': [0, 0],
'Luggage storage': [0, 0],
'Making drinks': [0, 0],
'Robo Rest. Show near hotel': [0, 0],
'Robot chair machine , robots display(museum)': [0, 0],
'Room Service': [0, 0],
'Room service': [0, 0],
'Room Service ': [0, 0],
'Room Service , Delivering items': [0, 0],
'Room Service , Interacting with customers': [0, 0],
'Room Service , kids entertainment': [0, 0],
'Delivering Food ': [0, 0],
'Delivering Food ': [0, 0],
'Delivering Food , dance': [0, 0],
'Delivering Food , taking order': [0, 0],
>Show and used in some performances': [0, 0],
'talking and interacting with others': [0, 0],
'veilon playing , car manufacturing helper': [0, 0],
'Waiter': [0, 0],
'Waiter , taking out dishes': [0, 0],
'Welcoming , walking in orchestra': [0, 0],
nan: [0, 0]}
```

```
for k in pont1:
    fn = dataset.loc[k, "Function"]
    a = x[fn]
    for j in pont1[k]:
        if (j is None or j == []):
            continue
        if (j[3] == "negative"):
            a[1] += 1
        else:
            a[0] +=1
```

x

```
{'bring amenities': [69, 2],
'Butler , Delivering items to rooms': [92, 2],
'Cooking , Delivering items to room': [308, 0],
'Dancing ': [0, 0],
'delivering food to table': [0, 0],
'Delivering items to room': [0, 0],
'Delivery , Waiter': [0, 0],
'dinosaur robots': [0, 0],
'Helping in maufacturing of cars': [0, 0],
'Interacting with customers at reception': [0, 0],
'Luggage storage': [0, 0],
'Making drinks': [0, 0],
'Robo Rest. Show near hotel': [0, 0],
'Robot chair machine , robots display(museum)': [0, 0],
'Room Service': [0, 0],
'Room service': [0, 0],
'Room Service ': [0, 0],
'Room Service , Delivering items': [0, 0],
'Room Service , Interacting with customers': [0, 0],
'Room Service , kids entertainment': [0, 0],
'Delivering Food ': [0, 0],
'Delivering Food ': [0, 0],
'Delivering Food , dance': [0, 0],
'Delivering Food , taking order': [0, 0],
>Show and used in some performances': [0, 0],
'talking and interacting with others': [0, 0],
'veilon playing , car manufacturing helper': [0, 0],
'Waiter': [0, 0],
'Waiter , taking out dishes': [0, 0],
'Welcoming , walking in orchestra': [0, 0],
nan: [0, 0]}
```

x

```
{'bring amenities': [69, 2],
'Butler , Delivering items to rooms': [92, 2],
'Cooking , Delivering items to room': [308, 0],
'Dancing ': [0, 0],
'delivering food to table': [0, 0],
'Delivering items to room': [0, 0],
'Delivery , Waiter': [0, 0],
'dinosaur robots': [0, 0],
'Helping in maufacturing of cars': [0, 0],
'Interacting with customers at reception': [0, 0],
'Luggage storage': [0, 0],
```

```
'Making drinks': [0, 0],  
'Robo Rest. Show near hotel': [0, 0],  
'Robot chair machine , robots display(museum)': [0, 0],  
'Room Service': [0, 0],  
'Room service': [0, 0],  
'Room Service ': [0, 0],  
'Room Service , Delivering items': [0, 0],  
'Room Service , Interacting with customers': [0, 0],  
'Room Service , kids entertainment': [0, 0],  
'Delivering Food ': [0, 0],  
'Delivering Food ': [0, 0],  
'Delivering Food , dance': [0, 0],  
'Delivering Food , taking order': [0, 0],  
'Show and used in some performances': [0, 0],  
'talking and interacting with others': [0, 0],  
'voilon playing , car manufacturing helper': [0, 0],  
'Waiter': [0, 0],  
'Waiter , taking out dishes': [0, 0],  
'Welcoming , walking in orchestra': [0, 0],  
nan: [0, 0]}
```

```
p = x.copy()  
for i in x:  
    if (x[i][0] == 0 and x[i][1] == 0):  
        p.pop(i)
```

```
x = p
```

```
import matplotlib.pyplot as plt  
import numpy as np  
  
categories = [i for i in x ]  
  
values1 = [x[i][0] for i in x] # POSITIVE  
values2 = [x[i][1] for i in x] # NEGATIVE
```

```
bar_width = 0.35
```

```
l = np.arange(len(categories))  
plt.figure(figsize=(10, 6))  
  
plt.bar(l - bar_width/2, values1, bar_width, label='Positive', color='g', align='center')  
plt.bar(l + bar_width/2, values2, bar_width, label='Negative', color='r', align='center')  
  
plt.xlabel('Categories')  
plt.ylabel('Values')  
plt.title('Double Bar Chart')  
plt.xticks(l, categories)  
plt.legend()  
  
plt.show()
```

