Load Dataset

```
#·Import·Pandas
import·pandas·as·pd

#·Load·Metadata
metadata·=·pd.read_csv('CleaningDataset.csv',·low_memory=False)

#·Print·the·first·three·rows
metadata.head(3)
```

	Coffee Name	Tasting Notes	Description
0	Barbary Coast Blend	Earthy, Dried Spice, Full Body	Hearty, dark roasted Arabica blend with bold, ...
1	Bourbon Pecan	Nutty Pecan, Sweet Bourbon, Smooth Finish	Light roasted Arabica blend enhanced with the ...

```
#Print plot overviews of the first 5 Coffee Descriptions.
metadata['Description'].head()
```

```
0    Hearty, dark roasted Arabica blend with bold, ...
1    Light roasted Arabica blend enhanced with the ...
2    Well balanced Arabica blend with complex finis...
3    A great combination of rich, creamy coffee and...
4    A smooth blend of Colombian and Central Americ...
Name: Description, dtype: object
```

Identifying Term Frequency for Description

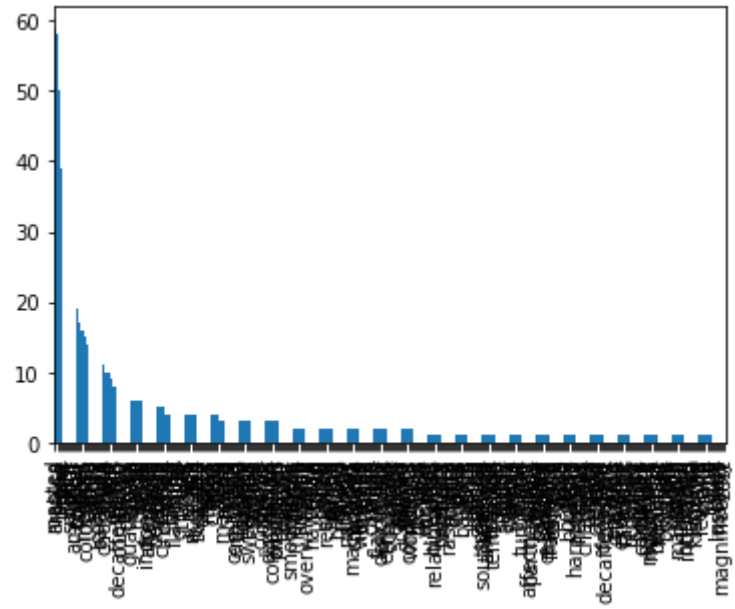
```
# Activate CountVectorizer
from sklearn.feature_extraction.text import CountVectorizer

# Count Vectorizer
vect = CountVectorizer(analyzer='word',stop_words='english',lowercase=True)
vects = vect.fit_transform(metadata['Description'])

td = pd.DataFrame(vects.todense()).iloc[:78]
td.columns = vect.get_feature_names()
term_document_matrix = td.T
term_document_matrix.columns = ['Blend '+str(i) for i in range(1, 79)]
term_document_matrix['total_count'] = term_document_matrix.sum(axis=1)

#Number of Unique Words
```

```
print(term_document_matrix.shape)
```

```
(310, 79)
```

```
# Top 25 words
term_document_matrix = term_document_matrix.sort_values(by ='total_count',ascending=Fa

text_file = open('TF-.txt', 'w')
term_document_matrix['total_count'].plot.bar()
```

```
<AxesSubplot:>
```



Identifying Term Frequency for Tasting Notes

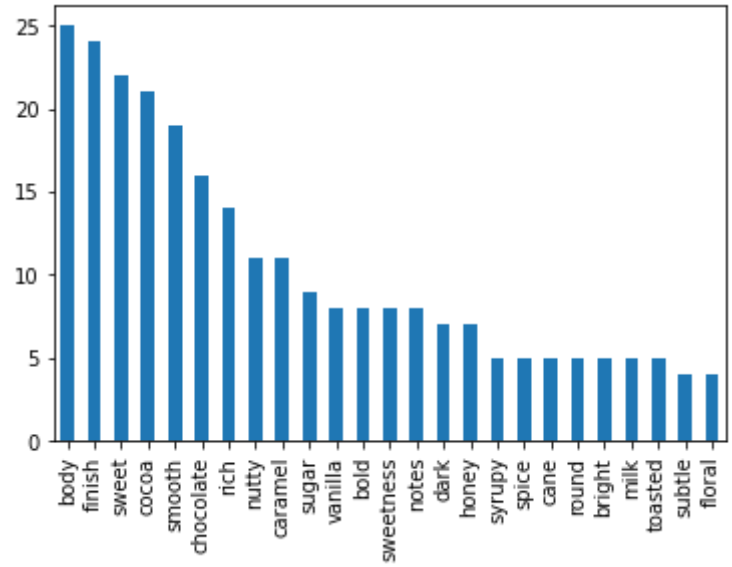
```
# Activate CountVectorizer
from sklearn.feature_extraction.text import CountVectorizer

# Count Vectorizer
vect = CountVectorizer(analyzer='word',stop_words='english',lowercase=True)
vects = vect.fit_transform(metadata['Tasting Notes'])

td = pd.DataFrame(vects.todense()).iloc[:78]
td.columns = vect.get_feature_names()
term_document_matrix = td.T
term_document_matrix.columns = ['Blend '+str(i) for i in range(1, 79)]
term_document_matrix['total_count'] = term_document_matrix.sum(axis=1)
print(term_document_matrix.shape)
```

```
(101, 79)
```

```
# Top 25 words
top = term_document_matrix.sort_values(by ='total_count',ascending=False)[:25]
```

```
top['total_count'].plot.bar()
```

```
<AxesSubplot:>
```



Recommendation based on Description

```
#Import TfIdfVectorizer from scikit-learn
from sklearn.feature_extraction.text import TfidfVectorizer

#Define a TF-IDF Vectorizer Object.
#Remove all english stop words such as 'the', 'a'
#Sets all words to lowercase
tfidf = TfidfVectorizer(analyzer='word',stop_words='english',lowercase=True)

#Replace NaN with an empty string
metadata['Description'] = metadata['Description'].fillna('')

#Construct the required TF-IDF matrix by fitting and transforming the data
tfidf_matrix = tfidf.fit_transform(metadata['Description'])

#Output the shape of tfidf_matrix
tfidf_matrix.shape
```

```
(78, 310)
```

```
tfidf.get_feature_names()
```

```
['50',
 'aa',
 'accented',
 'acid',
 'acidity',
 'adding',
 'affectionately',
 'african',
 'aftertaste',
 'alajeula',
 'almond',
 'almonds',
 'american',
 'americans',
 'amistad',
 'antigua',
 'ape',
 'arabica',
 'aroma',
 'auction',
 'award',
 'baked',
 'balance',
 'balanced',
 'bean',
 'beans',
 'best',
 'blend',
 'blended',
 'blue',
 'blueberry',
 'boded',
 'bodied',
 'body',
 'bold',
 'boquete',
 'bouquet',
 'bourbon',
 'brazil',
 'breakfast',
 'brew',
 'bright',
 'brimming',
 'brooding',
 'brown',
 'buns',
 'bursting',
 'buttery',
 'caffeine',
 'cajamarca',
 'caramel',
 'cedar',
 'central',
 'certified',
 'character',
 'cherry',
```

```
       'chestnut',
```

```
# Import linear_kernel
from sklearn.metrics.pairwise import linear_kernel

# Compute the cosine similarity matrix
cosine_sim = linear_kernel(tfidf_matrix, tfidf_matrix)
```

```
cosine_sim.shape
```

```
(78, 78)
```

```
cosine_sim[1]
```

```
array([0.06303551, 1.        , 0.03435994, 0.        , 0.16204378,
       0.03751442, 0.1047496 , 0.05220398, 0.01354826, 0.08947585,
       0.1035884 , 0.        , 0.01317103, 0.04637267, 0.01250463,
       0.02828801, 0.0497072 , 0.10201494, 0.11879988, 0.09642281,
       0.09025849, 0.07473008, 0.03020199, 0.27367482, 0.03700567,
       0.04720272, 0.05535121, 0.05120416, 0.11499106, 0.06595802,
       0.04029915, 0.21436814, 0.06530241, 0.04380946, 0.13808386,
       0.03704985, 0.02666882, 0.02311476, 0.03375353, 0.10345156,
       0.1049023 , 0.08790399, 0.08109316, 0.09465135, 0.16324527,
       0.02759209, 0.07612926, 0.06411835, 0.07527193, 0.04393266,
       0.02705854, 0.02499498, 0.04456052, 0.07155462, 0.02669501,
       0.03044811, 0.07586936, 0.0488234 , 0.05206793, 0.1272307 ,
       0.14311768, 0.        , 0.07304489, 0.11535491, 0.03268061,
       0.02653578, 0.03122631, 0.04725396, 0.03295675, 0.01274235,
       0.03848393, 0.028606  , 0.04673628, 0.        , 0.2818797 ,
       0.08372182, 0.05349848, 0.03052287])
```

```
#Construct a reverse map of indices and Coffee Names
indices = pd.Series(metadata.index, index=metadata['Coffee Name']).drop_duplicates()
```

```
indices[:10]
```

```
Coffee Name
Barbary Coast Blend          0
Bourbon Pecan                1
Breakfast Blend              2
Cappuccino Fudge             3
Caramel Nut Fudge            4
Chocolate Macadamia Nut      5
Chocolate Raspberry Cream    6
Cinnamon Bun                 7
Cinnamon Frangelico          8
Cinnamon Nut Sugar Cookie    9
dtype: int64
```

```
text_file = open('RecommendationDescription.txt', 'w')
```

```
text_file.write("CSCI 187 - Project Coffee \n" )
text_file.write("Matthew Rahardja \n" )
text_file.write("This Text File contains the top 5 similarity results\n" )
text_file.write("for each Coffee Blend based on description \n\n")


for ind in metadata.index:
    Selected_Blend = metadata['Coffee Name'][ind]
    Selected_Description = metadata['Description'][ind]
    idx = indices[Selected_Blend]

    # Get the pairwise similarity scores of all blends with that blend
    sim_scores = list(enumerate(cosine_sim[idx]))

    # Sort the movies based on the similarity scores
    sim_scores = sorted(sim_scores, key=lambda x: x[1], reverse=True)

    # Get the scores of the 5 most similar coffee
    sim_scores = sim_scores[1:6]

    # Get the movie indices
    coffee_indices = [i[0] for i in sim_scores]

    # Return the top 10 most similar coffee

    text_file.write("%s\n" % Selected_Blend)
    text_file.write("%s\n" % Selected_Description)

    text_file.write("\nBlend Index         Blend Name\n")
    text_file.write("%s\n" % metadata['Coffee Name'].iloc[coffee_indices])
    text_file.write("\nSimilarity Score\n")
    text_file.write("%s\n\n\n\n" % sim_scores)

text_file.close()
```

Recommendation Based on Tasting Notes

```
#Import TfIdfVectorizer from scikit-learn
from sklearn.feature_extraction.text import TfidfVectorizer

#Define a TF-IDF Vectorizer Object.
#Remove all english stop words such as 'the', 'a'
#Sets all words to lowercase
tfidf = TfidfVectorizer(analyzer='word',stop_words='english',lowercase=True)

#Replace NaN with an empty string
metadata['Tasting Notes'] = metadata['Tasting Notes'].fillna('')
```

```
#Construct the required TF-IDF matrix by fitting and transforming the data
tfidf_matrix = tfidf.fit_transform(metadata['Tasting Notes'])

#Output the shape of tfidf_matrix
tfidf_matrix.shape
```

```
(78, 101)
```

```
tfidf.get_feature_names()
```

```
['acidity',
 'apple',
 'baked',
 'balanced',
 'berry',
 'bittersweet',
 'black',
 'blackberry',
 'blossom',
 'blueberry',
 'body',
 'bold',
 'bourbon',
 'bright',
 'brown',
 'butter',
 'butterscotch',
 'buttery',
 'cane',
 'caramel',
 'caramelized',
 'cedar',
 'cherry',
 'chocolate',
 'cinnamon',
 'citrus',
 'clean',
 'cocoa',
 'cream',
 'creamy',
 'dark',
 'deep',
 'dried',
 'dutch',
 'earthiness',
 'earthy',
 'fig',
 'finish',
 'floral',
 'florals',
 'frangelico',
 'fresh',
 'fruit',
```

```
        'fudge',
        'grape',
        'hazelnut',
        'heavy',
        'hint',
        'hips',
        'honey',
        'intense',
        'irish',
        'jasmine',
        'lavender',
        'lemon',
        'liqueur',
        'mango',
        'marjoram',
```

```
# Import linear_kernel
from sklearn.metrics.pairwise import linear_kernel

# Compute the cosine similarity matrix
cosine_sim = linear_kernel(tfidf_matrix, tfidf_matrix)
```

```
cosine_sim.shape
```

```
(78, 78)
```

```
cosine_sim[1]
```

```
array([0.        , 1.        , 0.18803599, 0.15004225, 0.29231339,
       0.15772381, 0.08650415, 0.16812361, 0.08742161, 0.26629077,
       0.08919698, 0.07640756, 0.        , 0.11233114, 0.        ,
       0.16539101, 0.19540693, 0.08919698, 0.17408865, 0.11603567,
       0.13710735, 0.19897312, 0.        , 0.41040108, 0.15680633,
       0.        , 0.        , 0.        , 0.32120175, 0.32120175,
       0.        , 0.        , 0.        , 0.07024672, 0.22928213,
       0.07486486, 0.        , 0.        , 0.06735895, 0.07974793,
       0.        , 0.        , 0.08470553, 0.29226708, 0.11024532,
       0.07119279, 0.08838272, 0.        , 0.07617651, 0.        ,
       0.08339627, 0.        , 0.        , 0.        , 0.        ,
       0.        , 0.23453785, 0.        , 0.3460151 , 0.06857572,
       0.        , 0.18803599, 0.        , 0.28621255, 0.07410997,
       0.14991258, 0.32357635, 0.        , 0.07529373, 0.07975852,
       0.        , 0.08996209, 0.09133706, 0.        , 0.31358025,
       0.41040108, 0.        , 0.        ])
```

```
#Construct a reverse map of indices and Coffee Names
indices = pd.Series(metadata.index, index=metadata['Coffee Name']).drop_duplicates()
```

```
indices[:10]
```

```
Coffee Name
Barbary Coast Blend          0
```

```
Bourbon Pecan                1
Breakfast Blend              2
Cappuccino Fudge             3
Caramel Nut Fudge            4
Chocolate Macadamia Nut      5
Chocolate Raspberry Cream    6
Cinnamon Bun                 7
Cinnamon Frangelico          8
Cinnamon Nut Sugar Cookie    9
dtype: int64
```

```
text_file = open('RecommendationFlavor.txt', 'w')

text_file.write("CSCI 187 - Project Coffee \n" )
text_file.write("Matthew Rahardja \n" )
text_file.write("This txt file contains the top 5 similarity results\n" )
text_file.write("for each Coffee Blend based on Flavor Notes \n\n")


for ind in metadata.index:
    Selected_Blend = metadata['Coffee Name'][ind]
    Selected_Description = metadata['Tasting Notes'][ind]
    idx = indices[Selected_Blend]

    # Get the pairwise similarity scores of all blends with that blend
    sim_scores = list(enumerate(cosine_sim[idx]))

    # Sort the movies based on the similarity scores
    sim_scores = sorted(sim_scores, key=lambda x: x[1], reverse=True)

    # Get the scores of the 5 most similar coffee
    sim_scores = sim_scores[1:6]

    # Get the movie indices
    coffee_indices = [i[0] for i in sim_scores]

    # Return the top 10 most similar coffee

    text_file.write("%s\n" % Selected_Blend)
    text_file.write("%s\n" % Selected_Description)

    text_file.write("\nBlend Index         Blend Name\n")
    text_file.write("%s\n" % metadata['Coffee Name'].iloc[coffee_indices])
    text_file.write("\nSimilarity Score\n")
    text_file.write("%s\n\n\n\n" % sim_scores)

text_file.close()
```