Untitled

November 14, 2020

```python
[1]: import pandas as pd
     pf=pd.read_csv(r"K8 Reviews v0.2.csv")
     sentiment=pf["sentiment"]
     review=pf["review"]
     #print(sentiment)
     #print(review)
     pf.head()
```

```
[1]:    sentiment                                             review
     0          1            Good but need updates and improvements
     1          0   Worst mobile i have bought ever, Battery is dr…
     2          1   when I will get my 10% cash back… its alrea…
     3          1                                               Good
     4          0   The worst phone everThey have changed the last…
```

```python
[2]: import nltk
     from nltk import word_tokenize,pos_tag
     tokenized_review=[]
     for i in review:
         tokenized_review.append(word_tokenize(i))
     tagged_review=[]
     for i in tokenized_review:
         tagged_review.append(pos_tag(i))
```

```python
[3]: sent_nouns=[]
     for i in tagged_review:
         nouns=[]
         for j in i:
             if j[1][0]=="N" :
                 nouns.append(j[0])
         sent_nouns.append(nouns)
```

```python
[4]: from nltk.corpus import stopwords
     special_chars=["!","@","#","%","&",",",".",";"]
     stop_words=special_chars+[x for x in set(stopwords.words('english'))]
     filtered_sent=[]
     for i in sent_nouns:
```

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        filtered_sent.append([x for x in i if x not in stop_words])
```

```
[5]: from nltk.stem import WordNetLemmatizer
     lem=WordNetLemmatizer()
     lemmatized_sent=[]
     for i in filtered_sent:
         lemmatized_sent.append([lem.lemmatize(x) for x in i])
```

```
[41]: from gensim import models,corpora
      dictionary=corpora.Dictionary(lemmatized_sent)
      doc_term_matrix=[dictionary.doc2bow(x) for x in lemmatized_sent]
      lda12=models.
       ↪LdaModel(corpus=doc_term_matrix,num_topics=12,id2word=dictionary,passes=10)
      lda12.print_topics()
```

```
[41]: [(0,
        '0.058*"Amazon" + 0.049*"service" + 0.042*"Lenovo" + 0.038*"issue" +
      0.030*"problem" + 0.025*"K8" + 0.024*"day" + 0.020*"Note" + 0.020*"customer" +
      0.019*"network"'),
       (1,
        '0.114*"price" + 0.053*"range" + 0.052*"feature" + 0.040*"speaker" +
      0.028*"handset" + 0.022*"Bluetooth" + 0.017*"piece" + 0.015*"cast" +
      0.014*"phone.." + 0.013*"work"'),
       (2,
        '0.361*"mobile" + 0.020*"Network" + 0.017*"item" + 0.014*"voice" +
      0.013*"Worst" + 0.011*"draining" + 0.010*"drainage" + 0.010*"Pls" + 0.009*"jata"
      + 0.008*"Performance"'),
       (3,
        '0.202*"camera" + 0.112*"quality" + 0.049*"Camera" + 0.022*"mode" +
      0.021*"Battery" + 0.019*"display" + 0.018*"performance" + 0.017*"sound" +
      0.014*"feature" + 0.013*"picture"'),
       (4,
        '0.122*"phone" + 0.023*"update" + 0.020*"software" + 0.020*"issue" +
      0.014*"lenovo" + 0.013*"day" + 0.013*"game" + 0.013*"time" + 0.012*"processor" +
      0.012*"review"'),
       (5,
        '0.190*"problem" + 0.071*"heating" + 0.035*"issue" + 0.031*"hai" +
      0.031*"network" + 0.029*"h" + 0.019*"Bad" + 0.016*"ho" + 0.012*"Oreo" +
      0.012*"class"'),
       (6,
        '0.522*"phone" + 0.036*"Awesome" + 0.032*"month" + 0.024*"Worst" +
      0.016*"issue" + 0.016*"budget" + 0.012*"bit" + 0.011*"Excellent" + 0.010*"time"
      + 0.007*"fast"'),
       (7,
        '0.381*"product" + 0.074*"Mobile" + 0.023*"delivery" + 0.022*"hr" +
      0.020*"Poor" + 0.017*"Worst" + 0.014*"star" + 0.013*"cam" + 0.012*"connection" +
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  0.011*"worth"'),
 (8,
  '0.155*"Nice" + 0.038*"Phone" + 0.035*"Great" + 0.029*".." + 0.026*"Best" +
0.017*"NOT" + 0.014*"IS" + 0.012*"cell" + 0.012*"PHONE" + 0.010*"AND"'),
 (9,
  '0.078*"note" + 0.072*"Lenovo" + 0.032*"call" + 0.031*"k8" + 0.028*"screen" +
0.017*"app" + 0.016*"feature" + 0.015*"option" + 0.015*"K8" + 0.012*"music"'),
 (10,
  '0.209*"battery" + 0.059*"Battery" + 0.049*"backup" + 0.044*"hour" +
0.043*"performance" + 0.041*"day" + 0.038*"charger" + 0.032*"time" +
0.027*"life" + 0.025*"charge"'),
 (11,
  '0.136*"money" + 0.044*"waste" + 0.034*"value" + 0.032*"box" +
0.032*"replacement" + 0.028*"Super" + 0.023*"device" + 0.022*"superb" +
0.022*"set" + 0.020*"Value"')]
```

```python
from gensim.models.coherencemodel import CoherenceModel
for i in range(5,16):
    lda=models.
 LdaModel(corpus=doc_term_matrix,num_topics=i,id2word=dictionary,passes=50,iterations=100,ra

 
 coh_model=CoherenceModel(model=lda,dictionary=dictionary,texts=lemmatized_sent,coherence='c
    print("model_topics : ", i)
    print(lda.print_topics())
    print("coherence score :", coh_model.get_coherence())
```

```
model_topics :  5
[(0, '0.038*"battery" + 0.028*"backup" + 0.022*"Battery" + 0.016*"hr" +
0.015*"Product" + 0.013*"drain" + 0.010*"Super" + 0.008*"usage" + 0.007*"NOT" +
0.007*"mah"'), (1, '0.096*"phone" + 0.054*"problem" + 0.051*"issue" +
0.034*"battery" + 0.026*"time" + 0.019*"day" + 0.018*"month" + 0.016*"heating" +
0.014*"hour" + 0.014*"charger"'), (2, '0.052*"mobile" + 0.050*"phone" +
0.049*"Nice" + 0.042*"camera" + 0.038*"money" + 0.026*"product" + 0.018*"Phone"
+ 0.012*".." + 0.012*"waste" + 0.012*"speed"'), (3, '0.064*"phone" +
0.059*"camera" + 0.036*"quality" + 0.028*"price" + 0.022*"battery" +
0.022*"Camera" + 0.019*"performance" + 0.018*"feature" + 0.011*"range" +
0.011*"mode"'), (4, '0.068*"product" + 0.040*"Lenovo" + 0.039*"phone" +
0.029*"note" + 0.015*"Amazon" + 0.015*"mobile" + 0.015*"k8" + 0.015*"service" +
0.014*"call" + 0.013*"Awesome"')]
coherence score : 0.47984255618507665
model_topics :  6
[(0, '0.020*"hai" + 0.010*"Excellent" + 0.009*"ho" + 0.009*"notification" +
0.008*"handset" + 0.008*"piece" + 0.007*"contact" + 0.006*"Charger" +
0.006*"bhi" + 0.005*"month"'), (1, '0.054*"problem" + 0.047*"phone" +
0.042*"issue" + 0.023*"Mobile" + 0.015*"update" + 0.015*"device" +
0.015*"heating" + 0.015*"speaker" + 0.014*"Lenovo" + 0.014*"software"'), (2,
'0.094*"camera" + 0.085*"phone" + 0.054*"quality" + 0.045*"Nice" +
```

0.028*"Camera" + 0.021*"performance" + 0.019*"mobile" + 0.018*"price" +
0.014*"Phone" + 0.011*"money"'), (3, '0.012*"processor" + 0.010*"smartphone" +
0.010*"K8" + 0.009*"stock" + 0.009*"memory" + 0.009*"Note" + 0.009*"Android" +
0.008*"sensor" + 0.007*"core" + 0.007*"feature"'), (4, '0.131*"phone" +
0.038*"mobile" + 0.032*"price" + 0.027*"service" + 0.024*"Lenovo" +
0.018*"money" + 0.018*"Awesome" + 0.016*"Amazon" + 0.013*"feature" +
0.011*"range"'), (5, '0.060*"battery" + 0.055*"product" + 0.049*"phone" +
0.025*"camera" + 0.019*"day" + 0.019*"note" + 0.019*"issue" + 0.018*"Lenovo" +
0.017*"time" + 0.016*"problem"')]
coherence score : 0.4904218674887126
model_topics : 7
[(0, '0.025*"hai" + 0.013*"box" + 0.012*"ho" + 0.011*"notification" +
0.010*"warranty" + 0.008*"Charger" + 0.007*"bill" + 0.007*"bhi" + 0.006*"Killer"
+ 0.005*"piece"'), (1, '0.045*"problem" + 0.035*"Mobile" + 0.029*"issue" +
0.025*"device" + 0.020*"update" + 0.017*"speaker" + 0.017*"Dolby" +
0.016*"charger" + 0.016*"heat" + 0.014*"month"'), (2, '0.086*"phone" +
0.079*"Nice" + 0.067*"camera" + 0.029*"quality" + 0.025*"mobile" +
0.018*"budget" + 0.016*".." + 0.015*"Bad" + 0.012*"Superb" + 0.010*"Worst"'),
(3, '0.026*"Camera" + 0.025*"camera" + 0.016*"quality" + 0.014*"processor" +
0.013*"feature" + 0.011*"value" + 0.010*"smartphone" + 0.009*"stock" +
0.009*"memory" + 0.008*"sensor"'), (4, '0.181*"phone" + 0.047*"price" +
0.031*"mobile" + 0.022*"service" + 0.020*"Lenovo" + 0.018*"range" +
0.018*"feature" + 0.018*"Awesome" + 0.014*"Amazon" + 0.011*"money"'), (5,
'0.076*"product" + 0.034*"Lenovo" + 0.032*"note" + 0.025*"phone" +
0.022*"camera" + 0.017*"quality" + 0.013*"k8" + 0.013*"option" + 0.012*"issue" +
0.012*"screen"'), (6, '0.087*"battery" + 0.066*"phone" + 0.038*"camera" +
0.034*"Battery" + 0.024*"performance" + 0.024*"issue" + 0.023*"backup" +
0.022*"problem" + 0.021*"day" + 0.018*"hour"')]
coherence score : 0.46695741000399604
model_topics : 8
[(0, '0.028*"waste" + 0.027*"hai" + 0.019*"money" + 0.013*"Waste" + 0.013*"ho" +
0.012*"notification" + 0.011*"box" + 0.008*"bhi" + 0.008*"color" + 0.008*"mi"'),
(1, '0.031*"Lenovo" + 0.030*"Mobile" + 0.025*"speaker" + 0.022*"phone" +
0.022*"problem" + 0.021*"K8" + 0.020*"Note" + 0.019*"issue" + 0.019*"device" +
0.018*"Amazon"'), (2, '0.092*"Nice" + 0.086*"phone" + 0.054*"money" +
0.027*"mobile" + 0.019*"budget" + 0.018*"value" + 0.017*"Bad" + 0.015*"Worst" +
0.014*"Superb" + 0.010*"Value"'), (3, '0.094*"camera" + 0.045*"quality" +
0.044*"phone" + 0.024*"feature" + 0.022*"Camera" + 0.014*"processor" +
0.012*"price" + 0.011*"mode" + 0.009*"music" + 0.009*"performance"'), (4,
'0.162*"phone" + 0.046*"note" + 0.044*"Lenovo" + 0.037*"mobile" + 0.035*"price"
+ 0.019*"k8" + 0.018*"feature" + 0.017*"Awesome" + 0.016*"screen" +
0.014*"range"'), (5, '0.130*"product" + 0.015*"call" + 0.013*"Amazon" +
0.012*"issue" + 0.012*"Product" + 0.012*"handset" + 0.011*"quality" +
0.011*"delivery" + 0.011*"Lenovo" + 0.011*"problem"'), (6, '0.096*"battery" +
0.067*"phone" + 0.038*"Battery" + 0.037*"problem" + 0.034*"issue" +
0.031*"camera" + 0.028*"performance" + 0.026*"backup" + 0.024*"day" +
0.022*"time"'), (7, '0.013*"NOT" + 0.013*"phone.." + 0.012*"Bluetooth" +
0.011*"IS" + 0.009*"PHONE" + 0.008*"bill" + 0.007*"plz" + 0.007*"LENOVO" +

0.007*"BATTERY" + 0.007*"IT"')]
coherence score : 0.5112655249268947
model_topics : 9
[(0, '0.032*"hai" + 0.027*"h" + 0.017*"handset" + 0.015*"ho" +
0.014*"notification" + 0.014*"waste" + 0.011*"fast" + 0.009*"u" +
0.009*"complaint" + 0.009*".."'), (1, '0.078*"problem" + 0.049*"Mobile" +
0.044*"device" + 0.028*"charger" + 0.024*"heat" + 0.019*"speaker" + 0.018*"box"
+ 0.014*"piece" + 0.012*"month" + 0.012*"set"'), (2, '0.118*"Nice" +
0.083*"phone" + 0.062*"Worst" + 0.049*"money" + 0.025*"mobile" + 0.023*"value" +
0.023*"budget" + 0.022*"Bad" + 0.012*"experience" + 0.012*"Poor"'), (3,
'0.021*"sensor" + 0.021*"smartphone" + 0.016*"core" + 0.014*"NOT" + 0.012*"IS" +
0.011*"processor" + 0.010*"PHONE" + 0.010*"cell" + 0.009*"fingerprint" +
0.008*"print"'), (4, '0.061*"Lenovo" + 0.052*"phone" + 0.043*"note" +
0.043*"mobile" + 0.023*"product" + 0.020*"call" + 0.019*"network" +
0.019*"screen" + 0.018*"service" + 0.018*"k8"'), (5, '0.088*"product" +
0.086*"camera" + 0.056*"quality" + 0.014*"Camera" + 0.012*"sound" +
0.011*"feature" + 0.011*"music" + 0.010*"Product" + 0.009*"speaker" +
0.009*"photo"'), (6, '0.119*"battery" + 0.047*"Battery" + 0.040*"phone" +
0.032*"backup" + 0.030*"camera" + 0.027*"performance" + 0.026*"day" +
0.025*"hour" + 0.022*"issue" + 0.019*"Camera"'), (7, '0.059*"phone" +
0.039*"Amazon" + 0.036*"issue" + 0.031*"Phone" + 0.030*"time" + 0.025*"problem"
+ 0.022*"heating" + 0.019*"day" + 0.019*"delivery" + 0.015*"return"'), (8,
'0.204*"phone" + 0.053*"price" + 0.025*"camera" + 0.024*"feature" +
0.021*"range" + 0.019*"Awesome" + 0.015*"update" + 0.013*"issue" +
0.011*"software" + 0.011*"performance"')]
coherence score : 0.5037550913465324
model_topics : 10
[(0, '0.049*"issue" + 0.036*"hai" + 0.035*"handset" + 0.029*"Network" +
0.023*"Super" + 0.017*"network" + 0.017*"set" + 0.016*"cost" +
0.016*"notification" + 0.015*"light"'), (1, '0.077*"Mobile" +
0.035*"performance" + 0.035*"heat" + 0.024*"waste" + 0.018*"glass" +
0.016*"item" + 0.014*"Good" + 0.012*"Phone" + 0.010*"star" + 0.010*"k4"'), (2,
'0.139*"Nice" + 0.081*"money" + 0.034*"mobile" + 0.031*"Great" + 0.027*"value" +
0.026*"Bad" + 0.021*"Superb" + 0.015*"experience" + 0.013*"class" +
0.010*"MP"'), (3, '0.018*"NOT" + 0.017*"superb" + 0.015*"IS" + 0.013*"PHONE" +
0.013*"cell" + 0.011*"condition" + 0.010*"BATTERY" + 0.010*"IT" + 0.010*"AND" +
0.009*"THE"'), (4, '0.098*"mobile" + 0.091*"Lenovo" + 0.074*"note" +
0.036*"service" + 0.034*"K8" + 0.030*"k8" + 0.021*"Note" + 0.014*"Amazon" +
0.012*"Awesome" + 0.012*"center"'), (5, '0.212*"product" + 0.031*"Amazon" +
0.020*"Product" + 0.017*"return" + 0.017*"delivery" + 0.015*"Worst" +
0.012*"clarity" + 0.010*"cast" + 0.009*"policy" + 0.008*"amazon"'), (6,
'0.173*"battery" + 0.068*"Battery" + 0.046*"backup" + 0.037*"hour" +
0.031*"charger" + 0.027*"day" + 0.026*"life" + 0.024*"issue" + 0.022*"time" +
0.020*"charge"'), (7, '0.212*"problem" + 0.042*"heating" + 0.038*"Phone" +
0.027*"speaker" + 0.021*"month" + 0.012*"Bluetooth" + 0.012*"voice" +
0.011*"side" + 0.008*"box" + 0.007*"Cast"'), (8, '0.172*"camera" +
0.090*"quality" + 0.048*"phone" + 0.037*"Camera" + 0.019*"feature" +
0.018*"mode" + 0.016*"performance" + 0.015*"sound" + 0.012*"Dolby" +

0.010*"picture"'), (9, '0.186*"phone" + 0.027*"price" + 0.026*"issue" + 0.017*"time" + 0.014*"feature" + 0.014*"day" + 0.013*"device" + 0.013*"update" + 0.012*"range" + 0.011*"Lenovo"')]
coherence score : 0.48790836248347624
model_topics : 11
[(0, '0.124*"money" + 0.040*"waste" + 0.039*"handset" + 0.032*"value" + 0.017*"system" + 0.014*"SIM" + 0.014*"fast" + 0.013*"purchase" + 0.013*"Charger" + 0.013*"cell"'), (1, '0.093*"problem" + 0.068*"device" + 0.063*"issue" + 0.061*"Mobile" + 0.029*"heat" + 0.028*"speaker" + 0.027*"return" + 0.025*"Network" + 0.025*"month" + 0.024*"Bluetooth"'), (2, '0.183*"camera" + 0.118*"quality" + 0.089*"Nice" + 0.052*"Camera" + 0.017*"speed" + 0.017*"clarity" + 0.017*"Bad" + 0.013*"feature" + 0.012*"photo" + 0.011*"Poor"'), (3, '0.024*"Excellent" + 0.021*"NOT" + 0.021*"app" + 0.018*"IS" + 0.015*"PHONE" + 0.013*"button" + 0.012*"BATTERY" + 0.012*"IT" + 0.011*"AND" + 0.010*"improvement"'), (4, '0.265*"mobile" + 0.063*"Awesome" + 0.023*"Superb" + 0.019*"service" + 0.018*"centre" + 0.018*"set" + 0.012*"recorder" + 0.011*"price" + 0.011*"bill" + 0.009*"pls"'), (5, '0.300*"product" + 0.030*"Amazon" + 0.028*"Product" + 0.026*"delivery" + 0.018*"Super" + 0.018*"buy" + 0.014*"experience" + 0.014*"Worst" + 0.013*"price" + 0.012*"service"'), (6, '0.165*"battery" + 0.065*"Battery" + 0.044*"backup" + 0.042*"performance" + 0.035*"hour" + 0.033*"heating" + 0.031*"problem" + 0.030*"charger" + 0.029*"day" + 0.029*"issue"'), (7, '0.054*"Phone" + 0.035*"hai" + 0.025*".." + 0.019*"cast" + 0.016*"ho" + 0.016*"phone.." + 0.010*"bhi" + 0.009*"Killer" + 0.009*"LENOVO" + 0.008*"MOBILE"'), (8, '0.066*"phone" + 0.064*"camera" + 0.062*"mode" + 0.028*"Worst" + 0.025*"depth" + 0.023*"Best" + 0.021*"hang" + 0.018*"expectation" + 0.017*"Phone" + 0.016*"Waste"'), (9, '0.211*"phone" + 0.028*"issue" + 0.022*"problem" + 0.019*"time" + 0.018*"day" + 0.018*"Lenovo" + 0.017*"call" + 0.017*"network" + 0.017*"update" + 0.014*"Amazon"'), (10, '0.058*"phone" + 0.049*"Lenovo" + 0.043*"note" + 0.030*"camera" + 0.026*"price" + 0.024*"feature" + 0.018*"range" + 0.017*"k8" + 0.017*"screen" + 0.016*"K8"')]
coherence score : 0.48254196348638184
model_topics : 12
[(0, '0.152*"money" + 0.049*"waste" + 0.039*"value" + 0.035*"box" + 0.024*"Oreo" + 0.017*"cover" + 0.017*"u" + 0.016*"ram" + 0.013*"update" + 0.012*"complaint"'), (1, '0.099*"Mobile" + 0.087*"performance" + 0.080*"heat" + 0.024*"set" + 0.023*"Value" + 0.023*"model" + 0.020*"item" + 0.018*"star" + 0.012*"wise" + 0.012*"Please"'), (2, '0.203*"Nice" + 0.038*"mobile" + 0.038*"clarity" + 0.038*"Bad" + 0.029*"camera" + 0.026*"image" + 0.022*"superb" + 0.019*"pic" + 0.019*"class" + 0.013*"cam"'), (3, '0.095*"device" + 0.036*"photo" + 0.030*"sensor" + 0.029*"expectation" + 0.022*"Excellent" + 0.020*"music" + 0.018*"button" + 0.018*"key" + 0.018*"app" + 0.014*"volta"'), (4, '0.107*"Lenovo" + 0.095*"mobile" + 0.084*"note" + 0.042*"screen" + 0.037*"K8" + 0.034*"call" + 0.034*"k8" + 0.031*"Awesome" + 0.025*"feature" + 0.024*"Note"'), (5, '0.187*"product" + 0.115*"camera" + 0.089*"quality" + 0.024*"Product" + 0.023*".." + 0.021*"handset" + 0.016*"Super" + 0.015*"Superb" + 0.015*"sound" + 0.012*"buy"'), (6, '0.163*"battery" + 0.056*"Battery" + 0.050*"Camera" + 0.049*"camera" + 0.043*"backup" + 0.035*"quality" +

0.031*"hour" + 0.029*"performance" + 0.025*"day" + 0.024*"issue"'), (7,
'0.226*"problem" + 0.092*"Phone" + 0.052*"heating" + 0.032*"speaker" +
0.024*"issue" + 0.023*"Bluetooth" + 0.018*"work" + 0.017*"Battery" +
0.013*"connectivity" + 0.013*"display"'), (8, '0.019*"NOT" + 0.019*"phone.." +
0.019*"GB" + 0.016*"IS" + 0.014*"Atmos" + 0.014*"PHONE" + 0.013*"Dolby" +
0.012*"Cast" + 0.011*"LENOVO" + 0.011*"BATTERY"'), (9, '0.259*"phone" +
0.032*"camera" + 0.019*"issue" + 0.017*"time" + 0.017*"update" + 0.015*"feature"
+ 0.014*"Lenovo" + 0.014*"software" + 0.010*"game" + 0.010*"processor"'), (10,
'0.090*"price" + 0.083*"phone" + 0.036*"range" + 0.022*"camera" + 0.019*"hai" +
0.017*"Great" + 0.017*"quality" + 0.016*"h" + 0.014*"feature" + 0.013*"Best"'),
(11, '0.053*"product" + 0.053*"Amazon" + 0.050*"issue" + 0.044*"service" +
0.036*"phone" + 0.035*"day" + 0.030*"network" + 0.028*"time" + 0.020*"month" +
0.019*"delivery"')]
coherence score : 0.4762031740171768
model_topics : 13
[(0, '0.153*"money" + 0.062*"network" + 0.050*"waste" + 0.048*"handset" +
0.040*"Network" + 0.039*"value" + 0.028*"purchase" + 0.024*"issue" +
0.024*"Waste" + 0.023*"condition"'), (1, '0.107*"Mobile" + 0.076*"charger" +
0.042*"star" + 0.025*"Turbo" + 0.022*"item" + 0.020*"Good" + 0.017*"Thanks" +
0.015*"model" + 0.014*"Killer" + 0.014*"today"'), (2, '0.037*"box" +
0.032*"Superb" + 0.030*"speed" + 0.029*"headphone" + 0.026*"earphone" +
0.025*"music" + 0.023*"Performance" + 0.023*"gallery" + 0.022*"superb" +
0.022*"button"'), (3, '0.232*"camera" + 0.171*"quality" + 0.060*"Camera" +
0.041*"Awesome" + 0.032*"device" + 0.026*"mode" + 0.022*"sound" + 0.020*"photo"
+ 0.020*"picture" + 0.019*"video"'), (4, '0.205*"mobile" + 0.069*"call" +
0.045*"screen" + 0.043*"feature" + 0.039*"option" + 0.028*"app" +
0.024*"network" + 0.017*"sim" + 0.017*"work" + 0.015*"cast"'), (5,
'0.361*"product" + 0.029*"clarity" + 0.025*"Super" + 0.022*"Worst" +
0.014*"class" + 0.014*"jio" + 0.014*"price" + 0.012*"volta" + 0.011*"everything"
+ 0.010*"performance"'), (6, '0.177*"battery" + 0.070*"Battery" + 0.048*"issue"
+ 0.047*"backup" + 0.039*"Nice" + 0.038*"performance" + 0.037*"problem" +
0.035*"heating" + 0.033*"hour" + 0.027*"day"'), (7, '0.154*"problem" +
0.103*"Phone" + 0.051*"update" + 0.049*"time" + 0.044*".." + 0.037*"software" +
0.028*"mark" + 0.026*"issue" + 0.026*"Bluetooth" + 0.026*"system"'), (8,
'0.056*"Note" + 0.047*"K8" + 0.041*"Dolby" + 0.033*"display" + 0.031*"Lenovo" +
0.025*"Everything" + 0.021*"key" + 0.019*"phone.." + 0.018*"smartphone" +
0.018*"Atmos"'), (9, '0.269*"phone" + 0.040*"price" + 0.035*"camera" +
0.019*"feature" + 0.017*"range" + 0.016*"issue" + 0.013*"performance" +
0.013*"processor" + 0.013*"Nice" + 0.011*"time"'), (10, '0.098*"note" +
0.090*"Lenovo" + 0.040*"k8" + 0.021*"hai" + 0.019*"glass" + 0.018*"K8" +
0.018*"h" + 0.015*"screen" + 0.013*"hang" + 0.011*"hand"'), (11, '0.087*"phone"
+ 0.060*"Amazon" + 0.050*"service" + 0.040*"day" + 0.027*"product" +
0.027*"Lenovo" + 0.025*"issue" + 0.022*"time" + 0.022*"delivery" +
0.021*"customer"'), (12, '0.076*"speaker" + 0.045*"Product" + 0.034*"Bad" +
0.023*"volume" + 0.021*"side" + 0.021*"set" + 0.021*"NOT" + 0.020*"voice" +
0.019*"piece" + 0.017*"IS"')]
coherence score : 0.48339412854453506
model_topics : 14

[(0, '0.063*"handset" + 0.042*"Super" + 0.037*"headphone" + 0.034*"earphone" + 0.021*"Charger" + 0.021*"cell" + 0.019*"team" + 0.017*"LENOVO" + 0.015*"Speaker" + 0.015*"complaint"'), (1, '0.112*"Mobile" + 0.076*"performance" + 0.043*"Bad" + 0.027*"set" + 0.026*"Value" + 0.025*"star" + 0.023*"item" + 0.022*"model" + 0.021*"Good" + 0.017*"Heating"'), (2, '0.082*"money" + 0.074*"screen" + 0.050*"option" + 0.039*"call" + 0.037*"app" + 0.027*"value" + 0.024*"box" + 0.021*"speed" + 0.018*"light" + 0.018*"cast"'), (3, '0.166*"feature" + 0.037*"key" + 0.033*"condition" + 0.032*"NOT" + 0.029*"bug" + 0.020*"music" + 0.016*"someone" + 0.016*"UI" + 0.013*"reception" + 0.013*"r"'), (4, '0.297*"mobile" + 0.071*"Awesome" + 0.051*"call" + 0.036*"sim" + 0.015*"SIM" + 0.014*"recorder" + 0.012*"bill" + 0.011*"design" + 0.011*"price" + 0.010*"facility"'), (5, '0.188*"product" + 0.161*"camera" + 0.116*"quality" + 0.044*"Camera" + 0.017*"clarity" + 0.014*"buy" + 0.012*"mark" + 0.012*"picture" + 0.011*"sound" + 0.011*"photo"'), (6, '0.200*"battery" + 0.088*"Battery" + 0.059*"backup" + 0.050*"Nice" + 0.040*"hour" + 0.032*"day" + 0.030*"life" + 0.026*"problem" + 0.023*"charge" + 0.023*"issue"'), (7, '0.164*"Phone" + 0.041*"Bluetooth" + 0.024*"display" + 0.023*"phone.." + 0.020*"IS" + 0.018*"experience" + 0.017*"Thanks" + 0.015*"PHONE" + 0.013*"BATTERY" + 0.011*"THE"'), (8, '0.060*"Note" + 0.060*"K8" + 0.050*"Lenovo" + 0.043*"heat" + 0.031*"Best" + 0.031*"smartphone" + 0.030*"Dolby" + 0.020*"GB" + 0.020*"sound" + 0.019*"Atmos"'), (9, '0.237*"phone" + 0.056*"camera" + 0.040*"price" + 0.017*"range" + 0.017*"quality" + 0.017*"feature" + 0.016*"mode" + 0.016*"performance" + 0.013*"processor" + 0.013*"Nice"'), (10, '0.122*"note" + 0.113*"Lenovo" + 0.050*"k8" + 0.026*"hai" + 0.022*"h" + 0.021*"K8" + 0.015*"specification" + 0.012*"ho" + 0.011*"lenovo" + 0.011*"cost"'), (11, '0.104*"phone" + 0.089*"problem" + 0.071*"issue" + 0.042*"Amazon" + 0.035*"service" + 0.032*"product" + 0.031*"time" + 0.028*"Lenovo" + 0.027*"network" + 0.026*"month"'), (12, '0.064*"speaker" + 0.044*"update" + 0.039*"Product" + 0.035*"glass" + 0.030*"system" + 0.026*"software" + 0.023*"button" + 0.022*"work" + 0.022*"expectation" + 0.020*"volume"'), (13, '0.123*"charger" + 0.078*".." + 0.034*"Everything" + 0.030*"turbo" + 0.029*"Excellent" + 0.028*"Waste" + 0.020*"Turbo" + 0.016*"bhi" + 0.015*"today" + 0.014*"IT"')]
coherence score : 0.4627810239515892
model_topics : 15
[(0, '0.172*"Phone" + 0.169*"money" + 0.055*"waste" + 0.043*"value" + 0.026*"Turbo" + 0.018*"everything" + 0.018*"cost" + 0.017*"Charger" + 0.017*"condition" + 0.016*"complaint"'), (1, '0.118*"Mobile" + 0.111*"performance" + 0.066*"speaker" + 0.031*"earphone" + 0.028*"set" + 0.024*"item" + 0.021*"model" + 0.019*"star" + 0.019*"Screen" + 0.017*"k"'), (2, '0.240*"Nice" + 0.045*"clarity" + 0.045*"Bad" + 0.037*"speed" + 0.028*"smartphone" + 0.027*"experience" + 0.026*"superb" + 0.019*"specification" + 0.017*"Performance" + 0.014*"pls"'), (3, '0.073*"option" + 0.045*"Everything" + 0.038*"contact" + 0.033*"message" + 0.025*"volta" + 0.025*"cell" + 0.020*"look" + 0.019*"body" + 0.018*"TV" + 0.016*"ringtone"'), (4, '0.296*"mobile" + 0.079*"price" + 0.071*"Awesome" + 0.048*"feature" + 0.041*"handset" + 0.037*"range" + 0.017*"Please" + 0.015*"fast" + 0.008*"Dont" + 0.008*"defect"'), (5, '0.414*"product" + 0.025*"Super" + 0.025*"buy" +

```
0.021*"Worst" + 0.020*"cast" + 0.015*"price" + 0.012*"screen" + 0.011*"Heating"
+ 0.010*"Good" + 0.010*"delivery"'), (6, '0.204*"battery" + 0.080*"Battery" +
0.054*"backup" + 0.040*"hour" + 0.036*"charger" + 0.035*"day" + 0.033*"issue" +
0.030*"life" + 0.027*"heat" + 0.026*"performance"'), (7, '0.321*"problem" +
0.062*"heating" + 0.037*"display" + 0.035*"month" + 0.032*"Bluetooth" +
0.024*"work" + 0.018*"connectivity" + 0.014*"killer" + 0.014*"connection" +
0.012*"bill"'), (8, '0.253*"camera" + 0.149*"quality" + 0.061*"Camera" +
0.020*"Best" + 0.017*"expectation" + 0.014*"photo" + 0.012*"phone.." +
0.011*"front" + 0.011*"pic" + 0.010*"image"'), (9, '0.518*"phone" +
0.026*"price" + 0.017*"feature" + 0.014*"Great" + 0.013*"budget" + 0.011*"time"
+ 0.010*"month" + 0.010*"Worst" + 0.009*"review" + 0.009*"range"'), (10,
'0.069*"camera" + 0.029*"quality" + 0.021*"processor" + 0.019*"sound" +
0.017*"mode" + 0.014*"music" + 0.014*"Dolby" + 0.014*"feature" +
0.013*"performance" + 0.012*"Camera"'), (11, '0.101*"issue" + 0.065*"Amazon" +
0.054*"service" + 0.044*"network" + 0.042*"day" + 0.037*"time" + 0.033*"device"
+ 0.023*"customer" + 0.022*"sim" + 0.021*"call"'), (12, '0.059*"Product" +
0.027*"NOT" + 0.022*"IS" + 0.020*"purchase" + 0.020*"box" + 0.019*"PHONE" +
0.015*"LENOVO" + 0.015*"BATTERY" + 0.015*"IT" + 0.014*"AND"'), (13, '0.060*".."
+ 0.056*"call" + 0.044*"hai" + 0.036*"h" + 0.035*"system" + 0.032*"app" +
0.025*"apps" + 0.022*"Excellent" + 0.021*"Waste" + 0.020*"Value"'), (14,
'0.150*"Lenovo" + 0.093*"note" + 0.043*"K8" + 0.038*"k8" + 0.035*"update" +
0.027*"Note" + 0.021*"screen" + 0.020*"software" + 0.019*"lenovo" +
0.019*"glass"')]
coherence score : 0.49295019264805046
```

As the coherence score for model with 8 topics is high,hence i would opine that 10 topics for the model will be optimum.

```
[8]: #tuning topics 8 with more passes
     lda8=models.
      ↪LdaModel(corpus=doc_term_matrix,num_topics=8,id2word=dictionary,passes=100,iterations=100,r
     lda8.print_topics()
```

```
[8]: [(0,
       '0.119*"phone" + 0.038*"camera" + 0.032*"price" + 0.024*"feature" +
     0.014*"range" + 0.010*"processor" + 0.010*"mode" + 0.009*"quality" +
     0.009*"screen" + 0.008*"music"'),
      (1,
       '0.085*"Battery" + 0.056*"Mobile" + 0.045*"heat" + 0.028*"handset" +
     0.028*"device" + 0.020*"Best" + 0.019*"Super" + 0.014*"expectation" +
     0.013*"backup" + 0.011*"Performance"'),
      (2,
       '0.294*"product" + 0.031*"speaker" + 0.011*"price" + 0.011*"everything" +
     0.010*"earphone" + 0.009*"complaint" + 0.006*".." + 0.006*"Worth" +
     0.005*"super" + 0.005*"word"'),
      (3,
       '0.101*"camera" + 0.071*"quality" + 0.044*"problem" + 0.043*"Camera" +
     0.035*"battery" + 0.032*"phone" + 0.029*"heating" + 0.028*"performance" +
```

```
  0.020*"Battery" + 0.018*"Phone"'),
 (4,
  '0.104*"battery" + 0.066*"phone" + 0.030*"time" + 0.029*"hour" + 0.029*"day" +
0.024*"charger" + 0.020*"problem" + 0.019*"mobile" + 0.019*"Worst" +
0.018*"backup"'),
 (5,
  '0.058*"Lenovo" + 0.053*"note" + 0.048*"phone" + 0.034*"issue" + 0.024*"K8" +
0.024*"network" + 0.022*"k8" + 0.019*"Awesome" + 0.015*"Note" +
0.014*"problem"'),
 (6,
  '0.061*"mobile" + 0.059*"phone" + 0.046*"Nice" + 0.035*"Amazon" +
0.029*"service" + 0.016*"screen" + 0.016*"problem" + 0.015*"day" +
0.014*"Lenovo" + 0.012*"product"'),
 (7,
  '0.023*"Product" + 0.021*"Great" + 0.016*"Bluetooth" + 0.012*"option" +
0.012*"star" + 0.011*"Phone" + 0.010*"delivery" + 0.010*"message" +
0.010*"superb" + 0.009*"notification"')]
```

```
[42]: import re
      model_topics=["features",'battery','speaker','camera','charger',"network",'service','delivery'
      terms_list=[]
      for k,v in lda8.print_topics():
          split=re.split("[+*]",v)
          lists=''
          for x in split:
              if split.index(x)%2==1:
                  lists+=x
          terms_list.append(lists)
```

```
[43]: table=pd.DataFrame()
      table["Topics"]=model_topics
      table["Terms"]=terms_list
      table
```

```
[43]:        Topics                                                  Terms
      0     features  "phone" "camera" "price" "feature" "range" "pr…
      1      battery  "Battery" "Mobile" "heat" "handset" "device" "…
      2      speaker  "product" "speaker" "price" "everything" "earp…
      3       camera  "camera" "quality" "problem" "Camera" "battery…
      4      charger  "battery" "phone" "time" "hour" "day" "charger…
      5      network  "Lenovo" "note" "phone" "issue" "K8" "network"…
      6      service  "mobile" "phone" "Nice" "Amazon" "service" "sc…
      7     delivery  "Product" "Great" "Bluetooth" "option" "star" …
```