Lección: Nicole Vera

```
[ ]
import pandas as pd
import re
from nltk.corpus import stopwords
from nltk.tokenize import word_tokenize
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.decomposition import NMF, LatentDirichletAllocation
from sklearn.metrics.pairwise import pairwise_distances
import matplotlib.pyplot as plt
from sklearn.decomposition import LatentDirichletAllocation
import numpy as np
```

```
[ ] from google.colab import drive
    drive.mount('/content/drive')
```

```
Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.mount("/content/drive", force_remount=True).
```

```
[ ] ruta_archivo = '/content/drive/MyDrive/datasets/data/drugsComTest_raw.tsv'
    df = pd.read_csv(ruta_archivo, sep='\t')
```

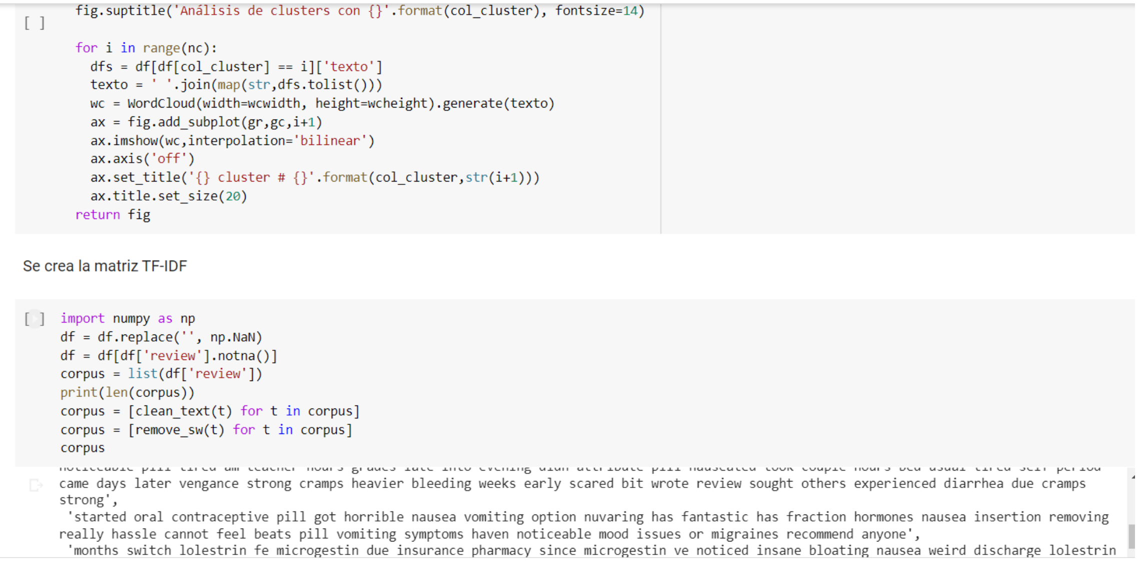
```
[ ] df
```

```
[ ] df
```

	Unnamed: 0	drugName	condition	review	rating	date	usefulCount
0	163740	Mirtazapine	Depression	"I&#039;ve tried a few antidepressants over th...	10.0	February 28, 2012	22
1	206473	Mesalamine	Crohn's Disease, Maintenance	"My son has Crohn&#039;s disease and has done ...	8.0	May 17, 2009	17
2	159672	Bactrim	Urinary Tract Infection	"Quick reduction of symptoms"	9.0	September 29, 2017	3
3	39293	Contrave	Weight Loss	"Contrave combines drugs that were used for al...	9.0	March 5, 2017	35
4	97768	Cyclafem 1 / 35	Birth Control	"I have been on this birth control for one cyc...	9.0	October 22, 2015	4
...	...	...	...	...	...	...	...
53761	159999	Tamoxifen	Breast Cancer, Prevention	"I have taken Tamoxifen for 5 years. Side effe...	10.0	September 13, 2014	43
53762	140714	Escitalopram	Anxiety	"I&#039;ve been taking Lexapro (escitaploprgra...	9.0	October 8, 2016	11
53763	130945	Levonorgestrel	Birth Control	"I&#039;m married, 34 years old and I have no ...	8.0	November 15, 2010	7
53764	47656	Tapentadol	Pain	"I was prescribed Nucynta for severe neck/shou...	1.0	November 28, 2011	20
53765	113712	Arthrotec	Sciatica	"It works!!!"	9.0	September 13, 2009	46

53766 rows × 7 columns

```
[ ] palabras_vacias = [linea.rstrip('\n') for linea in open('/content/drive/MyDrive/datasets/data/palabras_vacias.txt')]
    len(palabras_vacias)
```



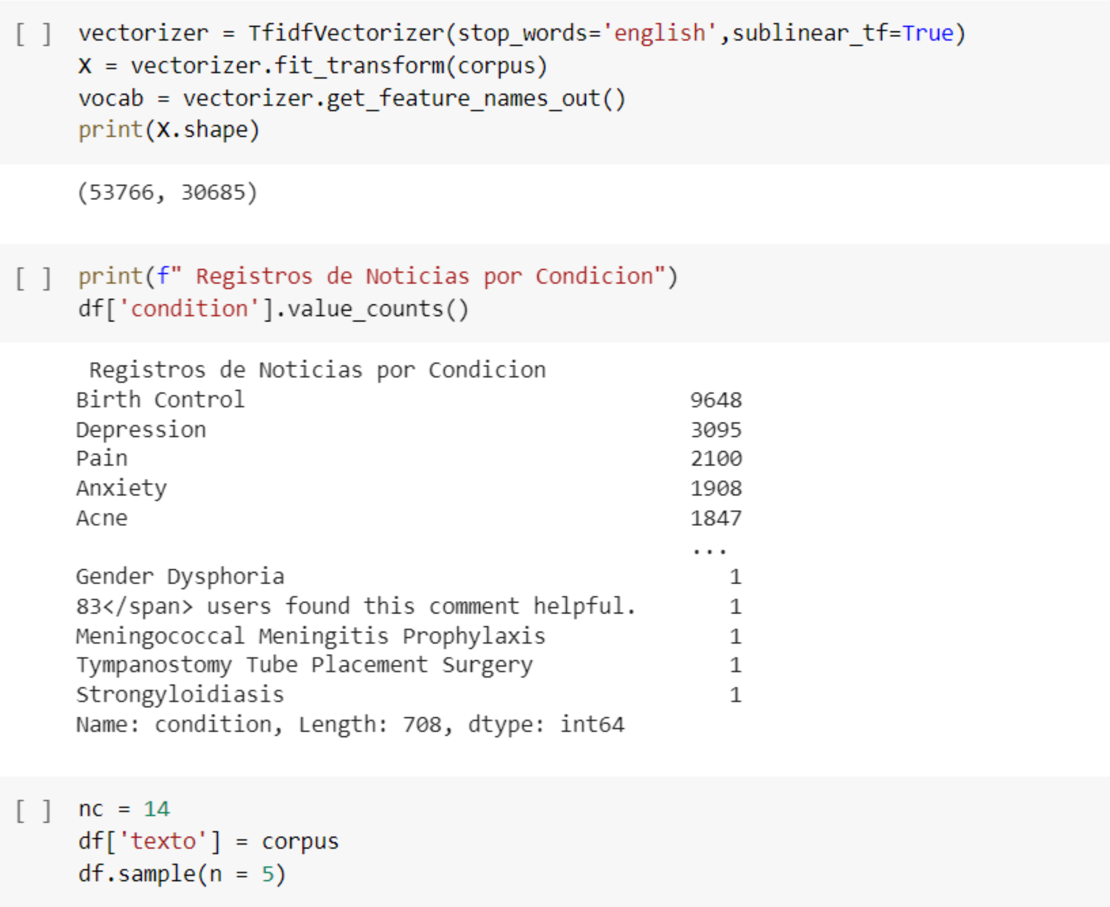
```
[ ]  fig.suptitle('Análisis de clusters con {}'.format(col_cluster), fontsize=14)

     for i in range(nc):
       dfs = df[df[col_cluster] == i]['texto']
       texto = ' '.join(map(str,dfs.tolist()))
       wc = WordCloud(width=wcwidth, height=wcheight).generate(texto)
       ax = fig.add_subplot(gr,gc,i+1)
       ax.imshow(wc,interpolation='bilinear')
       ax.axis('off')
       ax.set_title('{} cluster # {}'.format(col_cluster,str(i+1)))
       ax.title.set_size(20)
     return fig
```

Se crea la matriz TF-IDF

```
[ ] import numpy as np
    df = df.replace('', np.NaN)
    df = df[df['review'].notna()]
    corpus = list(df['review'])
    print(len(corpus))
    corpus = [clean_text(t) for t in corpus]
    corpus = [remove_sw(t) for t in corpus]
    corpus
```

```
noticeable pill tired am teacher hours grades late into evening didn attribute pill nauseated took couple hours bed usual tired self period
came days later vengance strong cramps heavier bleeding weeks early scared bit wrote review sought others experienced diarrhea due cramps
strong',
 'started oral contraceptive pill got horrible nausea vomiting option nuvaring has fantastic has fraction hormones nausea insertion removing
really hassle cannot feel beats pill vomiting symptoms haven noticeable mood issues or migraines recommend anyone',
 'months switch lolestrin fe microgestin due insurance pharmacy since microgestin ve noticed insane bloating nausea weird discharge lolestrin
```



```
[ ]  vectorizer = TfidfVectorizer(stop_words='english',sublinear_tf=True)
     X = vectorizer.fit_transform(corpus)
     vocab = vectorizer.get_feature_names_out()
     print(X.shape)
```

```
(53766, 30685)
```

```
[ ]  print(f" Registros de Noticias por Condicion")
     df['condition'].value_counts()
```

```
 Registros de Noticias por Condicion
Birth Control                              9648
Depression                                 3095
Pain                                       2100
Anxiety                                    1908
Acne                                       1847
                                           ...
Gender Dysphoria                              1
83</span> users found this comment helpful.    1
Meningococcal Meningitis Prophylaxis          1
Tympanostomy Tube Placement Surgery           1
Strongyloidiasis                              1
Name: condition, Length: 708, dtype: int64
```

```
[ ]  nc = 14
     df['texto'] = corpus
     df.sample(n = 5)
```

```
nc = 14
df['texto'] = corpus
df.sample(n = 5)
```

	Unnamed: 0	drugName	condition	review	rating	date	usefulCount	texto
21236	214812	Vicks Sinex Nasal Spray (old formulation)	Nasal Congestion	"I had severe congestion and pressure causing ...	9.0	October 19, 2016	4	severe congestion pressure causing pain headac...
6760	84849	Ethinyl estradiol / norgestimate	Abnormal Uterine Bleeding	"Do not try this, I had read the reviews b4 I ...	1.0	March 31, 2016	1	read reviews b started felt uneasy taking revi...
14780	154006	Vivitrol	Opiate Dependence	"First shot five days out of rehab, now on my ...	10.0	February 23, 2015	59	shot days rehab fourth longest clean ve years ...
45360	19144	Pregabalin	ibromyalgia	"It&#039;s sad when people write a drug of bec...	10.0	May 13, 2017	56	sad people write drug their experience negativ...
29935	108308	Bupropion / naltrexone	Obesity	"I have been on Contrave since April and have ...	10.0	June 15, 2015	51	contrave since april lost lbs absolutely medic...

```
[ ] lda_model = LatentDirichletAllocation(n_components=nc,random_state=10)
    lda = lda_model.fit_transform(X)
```

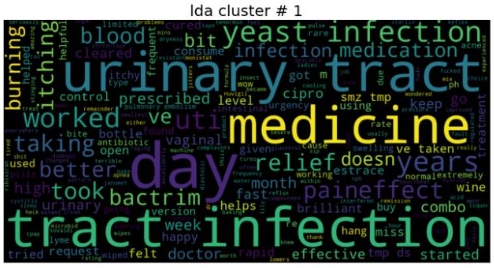
```
[ ] tp_palabra = {}
    n_top_pal = 15
    for topico, comp in enumerate(lda_model.components_):
      pal_ind = np.argsort(comp)[::-1][:n_top_pal]
      tp_palabra[topico] = [vocab[i] for i in pal_ind]
```

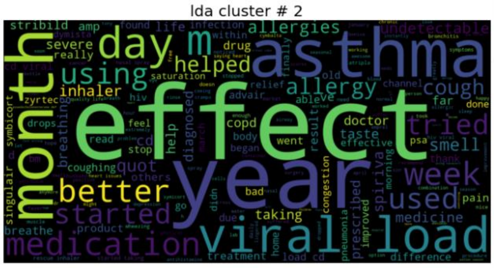
```
[ ] for topico,palabras in tp_palabra.items():
      print("Tópico {} : {}".format(topico,' ,'.join(palabras)))
```

```
Tópico 0 : infection ,yeast ,urinary ,tract ,infections ,burning ,itching ,invokana ,vaginal ,uti ,monistat ,diflucan ,bactrim ,doryx ,estrace
Tópico 1 : asthma ,load ,inhaler ,viral ,cd ,cough ,undetectable ,allergies ,advair ,singulair ,allergy ,hiv ,symbicort ,rescue ,copd
Tópico 2 : expensive ,fast ,diovan ,okay ,lasix ,vl ,makena ,herpes ,poison ,uc ,ivy ,ok ,anal ,arimidex ,hemorrhoids
Tópico 3 : mg ,anxiety ,depression ,feel ,life ,taking ,sleep ,effects ,years ,medication ,day ,like ,medicine ,started ,panic
Tópico 4 : smoking ,chantix ,quit ,smoke ,smoked ,excellent ,years ,smoker ,cigarette ,worked ,cigarettes ,pack ,dreams ,free ,day
Tópico 5 : pain ,day ,taking ,mg ,effects ,years ,medicine ,medication ,days ,doctor ,took ,severe ,hours ,prescribed ,like
Tópico 6 : lost ,lbs ,weight ,pounds ,eat ,started ,effects ,blood ,taking ,week ,day ,weeks ,pressure ,eating ,ve
Tópico 7 : silenor ,cancer ,harvoni ,previfem ,pradaxa ,hep ,blisovi ,camrese ,expensive ,prenatal ,coumadin ,pylera ,claravis ,detected ,liver
Tópico 8 : skin ,acne ,face ,using ,clear ,product ,dry ,cream ,used ,months ,red ,dermatologist ,cleared ,results ,weeks
Tópico 9 : taste ,water ,prep ,drink ,pm ,took ,bowel ,colonoscopy ,hours ,bathroom ,diarrhea ,drank ,stomach ,dose ,toilet
Tópico 10 : period ,pill ,birth ,control ,ve ,months ,periods ,bleeding ,month ,weight ,got ,sex ,cramps ,days ,mood
Tópico 11 : burning ,itching ,product ,monistat ,yeast ,sweat ,infection ,yi ,itch ,cream ,used ,vagina ,day ,sweating ,burn
Tópico 12 : fioricet ,maxalt ,ldl ,acid ,reflux ,gerd ,cholesterol ,heartburn ,crestor ,prevacid ,worked ,migraines ,zantac ,wonderful ,lipitor
Tópico 13 : dexedrine ,hyperactivity ,impotence ,adderall ,meniscus ,narcolepsy ,ritalin ,action ,bounce ,fullness ,petite ,cataplexy ,flair ,wor
```

```
[ ] topicos = []
    for n in range(lda.shape[0]):
      topicos.append(lda[n].argmax())
    df['lda'] = topicos
```

```
[ ] crear_nubes('lda')
```





Se procede a crear topicos con NMF

```
[ ] from sklearn.decomposition import NMF
```

```
[ ] nmf_model = NMF(n_components=nc,random_state=10,max_iter=400)
    nmf = nmf_model.fit_transform(X)
```

```
/usr/local/lib/python3.8/dist-packages/sklearn/decomposition/_nmf.py:289: FutureWarning: The 'init' value, when 'init=None' and n_components is l
  warnings.warn(
```

```
[ ] tp_palabras = {}
    for topico, comp in enumerate(nmf_model.components_):
      pal_ind = np.argsort(comp)[::-1][:n_top_pal]
      tp_palabras[topico] = [vocab[i] for i in pal_ind]
```

```
[ ] for topico,palabras in tp_palabra.items():
      print("Tópico {} : {}".format(topico,' ,'.join(palabras)))
```

```
Tópico 0 : infection ,yeast ,urinary ,tract ,infections ,burning ,itching ,invokana ,vaginal ,uti ,monistat ,diflucan ,bactrim ,doryx ,estrace
Tópico 1 : asthma ,load ,inhaler ,viral ,cd ,cough ,undetectable ,allergies ,advair ,singulair ,allergy ,hiv ,symbicort ,rescue ,copd
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Tópico 4 : smoking ,chantix ,quit ,smoke ,smoked ,excellent ,years ,smoker ,cigarette ,worked ,cigarettes ,pack ,dreams ,free ,day
Tópico 5 : pain ,day ,taking ,mg ,effects ,years ,medicine ,medication ,days ,doctor ,took ,severe ,hours ,prescribed ,like
Tópico 6 : lost ,lbs ,weight ,pounds ,eat ,started ,effects ,blood ,taking ,week ,day ,weeks ,pressure ,eating ,ve
Tópico 7 : silenor ,cancer ,harvoni ,previfem ,pradaxa ,hep ,blisovi ,camrese ,expensive ,prenatal ,coumadin ,pylera ,claravis ,detected ,liver
Tópico 8 : skin ,acne ,face ,using ,clear ,product ,dry ,cream ,used ,months ,red ,dermatologist ,cleared ,results ,weeks
Tópico 9 : taste ,water ,prep ,drink ,pm ,took ,bowel ,colonoscopy ,hours ,bathroom ,diarrhea ,drank ,stomach ,dose ,toilet
Tópico 10 : period ,pill ,birth ,control ,ve ,months ,periods ,bleeding ,month ,weight ,got ,sex ,cramps ,days ,mood
Tópico 11 : burning ,itching ,product ,monistat ,yeast ,sweat ,infection ,yi ,itch ,cream ,used ,vagina ,day ,sweating ,burn
Tópico 12 : fioricet ,maxalt ,ldl ,acid ,reflux ,gerd ,cholesterol ,heartburn ,crestor ,prevacid ,worked ,migraines ,zantac ,wonderful ,lipitor
Tópico 13 : dexedrine ,hyperactivity ,impotence ,adderall ,meniscus ,narcolepsy ,ritalin ,action ,bounce ,fullness ,petite ,cataplexy ,flair ,wor
```
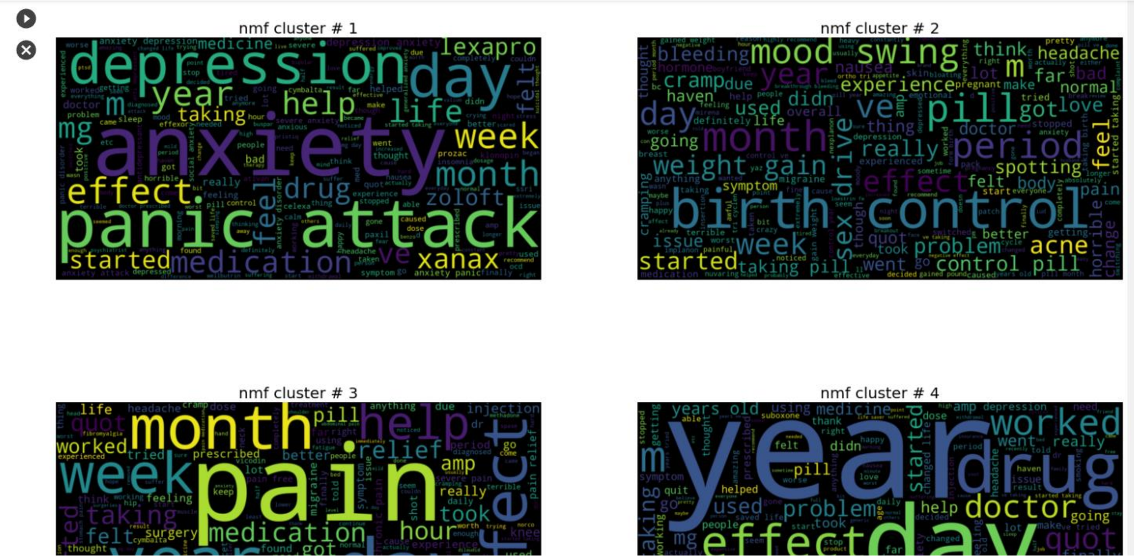

```
[ ] topicos = []
    for n in range(nmf.shape[0]):
      topicos.append(nmf[n].argmax())
    df['nmf'] = topicos
```

```
[ ] crear_nubes('nmf')
```


nmf cluster # 1
anxiety
panic attack
depression
day
effect
medication
week
month
drug
help
life
year
xanax
zoloft
lexapro
started
nmf cluster # 2
birth control
mood swing
month
pill
period
effect
weight gain
sex drive
week
acne
spotting
bleeding
cramp
control pill
started
nmf cluster # 3
pain
month
week
help
effect
medication
taking
relief
hour
took
surgery
injection
nmf cluster # 4
year
day
drug
effect
worked
doctor
problem
years old
started
used