Exploración

In [1]:

!ls clase_11b_bayes_word2vec.pdf requirements.txt tarea 3.ipynb data Reuters21578-Apte-90Cat.tar.gz tarea 3.pdf In [2]:

!ls data

test training

Training

In [3]:

!ls data/training/								
acq sun-oil	cpu	income	naphtha	rape-oil				
alum sunseed	crude	instal-debt	nat-gas	rapeseed				
barley tea	dfl	interest	nickel	reserves				
bop tin	dlr	ipi	nkr	retail				
carcass trade	dmk	iron-steel	nzdlr	rice				
castor-oil unknown	earn	jet	oat	rubber				
cocoa veg-oil	fuel	jobs	oilseed	rye				
coconut wheat	gas	l-cattle	orange	ship				
coconut-oil wpi	gnp	lead	palladium	silver				
coffee yen	gold	lei	palmkernel	sorghum				
copper zinc	grain	lin-oil	palm-oil	soybean				
copra-cake corn cotton l	groundnut groundnut-oil heat	livestock lumber meal-feed	pet-chem platinum potato	soy-meal soy-oil strategic-meta				
cotton-oil cpi	hog housing	<pre>money-fx money-supply</pre>	propane rand	sugar sun-meal				

Dataset: Acquisition

In [4]:

!ls data/training/acq

0000005 98	0001151 0008473	0002088	0003205	0004272	0005419	0006378	00075
0000007 01	0001152 0008483	0002090	0003210	0004284	0005428	0006384	00076
0000027 17	0001160 0008493	0002093	0003211	0004300	0005436	0006388	00076
0000028 18	0001166 0008497	0002095	0003237	0004306	0005441	0006393	00076
0000044 27	0001169 0008510	0002102	0003241	0004311	0005442	0006394	00076
0000065 30	0001171 0008513	0002107	0003260	0004319	0005444	0006396	00076
0000078 37	0001183 0008514	0002112	0003284	0004323	0005446	0006425	00076
0000087 38	0001204 0008527	0002117	0003294	0004329	0005448	0006428	00076
0000090 41	0001256 0008541	0002120	0003299	0004330	0005449	0006431	00076
0000095 42	0001257 0008545	0002122	0003301	0004345	0005457	0006446	00076
0000096 53	0001260 0008549	0002123	0003310	0004363	0005460	0006474	00076
0000112 56	0001262 0008550	0002124	0003312	0004364	0005461	0006489	00076
0000114 57	0001271 0008562	0002125	0003332	0004365	0005462	0006492	00076
0000117 59	0001273 0008582	0002131	0003338	0004368	0005463	0006496	00076
0000132 65	0001278 0008587	0002132	0003339	0004389	0005465	0006499	00076
0000133 69	0001281 0008588	0002139	0003344	0004398	0005466	0006502	00076
0000143 71	0001287 0008593	0002140	0003348	0004401	0005469	0006505	00076
0000185 74	0001296 0008594	0002141	0003366	0004404	0005470	0006509	00076
0000209 76	0001303 0008595	0002142	0003372	0004408	0005476	0006510	00076
0000212 77	0001308 0008600	0002143	0003385	0004422	0005483	0006514	00076
0000214 83	0001316 0008610	0002149	0003387	0004428	0005489	0006525	00076
0000224 84	0001320 0008624	0002150	0003388	0004432	0005495	0006531	00076
0000234 88	0001321 0008625	0002155	0003389	0004440	0005498	0006533	00076
0000236 96	0001326 0008626	0002157	0003391	0004452	0005501	0006535	00076
0000254 02	0001329 0008630	0002161	0003392	0004458	0005503	0006541	00077
0000255 07	0001333 0008638	0002163	0003398	0004467	0005505	0006544	00077
0000256 10	0001334 0008642	0002165	0003401	0004471	0005508	0006560	00077
0000258 11	0001343 0008645	0002168	0003402	0004472	0005524	0006566	00077
0000259 12	0001349 0008652	0002170	0003409	0004474	0005528	0006572	00077
0000260 16	0001373 0008654	0002174	0003418	0004476	0005529	0006574	00077
0000262	0001375	0002180	0003420	0004481	0005530	0006582	00077

17	0008661						
0000265	0001380	0002190	0003430	0004482	0005531	0006587	00077
21	0008667						
0000268 25	0001384 0008669	0002193	0003433	0004483	0005535	0006589	00077
0000269 26	0000009 0001392 0008670	0002202	0003436	0004487	0005537	0006600	00077
0000271 27	0001393	0002210	0003439	0004500	0005548	0006601	00077
0000275	0008673 0001396	0002215	0003440	0004507	0005549	0006608	00077
28 0000279	0008674	0002218	0003445	0004511	0005550	0006611	00077
30 0000281	0008683	0002220	0003449	0004519	0005552	0006619	00077
31 0000282 34	0008696 0001410 0008717	0002222	0003451	0004527	0005556	0006620	00077
0000289	0008717 0001412 0008722	0002225	0003462	0004528	0005571	0006626	00077
45 0000298 55	0001415	0002226	0003474	0004529	0005574	0006634	00077
0000304 59	0008739 0001417 0008746	0002228	0003491	0004531	0005575	0006635	00077
0000309	0008740 0001420 0008749	0002231	0003517	0004538	0005577	0006637	00077
0000313 64	0008749 0001428 0008760	0002234	0003519	0004549	0005578	0006638	00077
0000314 69	0008768 0008768	0002238	0003520	0004557	0005579	0006644	00077
0000315 72	0008708 0001441 0008776	0002239	0003521	0004558	0005580	0006653	00077
0000318 76	0008770 0001446 0008781	0002240	0003528	0004573	0005587	0006662	00077
0000319 78	0003761 0001450 0008782	0002242	0003530	0004577	0005592	0006665	00077
0000333 82	0008782 0001452 0008787	0002243	0003532	0004604	0005593	0006678	00077
0000336 84	0001462 0008793	0002246	0003535	0004612	0005598	0006684	00077
0000337 90	0001463 0008805	0002247	0003539	0004624	0005599	0006686	00077
0000339 94	0008803 0001464 0008811	0002249	0003540	0004631	0005602	0006690	00077
0000352 95	0000011 0001478 0008814	0002250	0003543	0004632	0005606	0006691	00077
0000353 05	0000014 0001492 0008821	0002251	0003544	0004643	0005613	0006699	00078
0000354 13	0000021 0001499 0008825	0002252	0003548	0004644	0005620	0006709	00078
0000357 19	0000025 0001500 0008830	0002253	0003562	0004648	0005621	0006710	00078
0000358 20	000050 0001501 0008844	0002257	0003575	0004653	0005623	0006713	00078
0000378 22	0000044 0001526 0008870	0002258	0003586	0004654	0005636	0006722	00078
0000388 24	0008872	0002283	0003604	0004661	0005660	0006726	00078
0000390 26	0000072 0001542 0008878	0002299	0003612	0004668	0005665	0006730	00078
0000392 27	0001549 0008881	0002312	0003622	0004675	0005670	0006733	00078

0000393 37	0001558 0008886	0002361	0003627	0004677	0005682	0006742	00078
0000395 48	0001564 0008894	0002371	0003653	0004678	0005688	0006752	00078
0000399 57	0001566 0008906	0002375	0003664	0004680	0005690	0006761	00078
0000400 65	0001567 0008913	0002378	0003666	0004684	0005693	0006762	00078
0000406 66	0000313 0001568 0008921	0002388	0003667	0004686	0005720	0006772	00078
0000408 72	0001580 0008929	0002389	0003670	0004689	0005754	0006776	00078
0000428 75	0001585 0008941	0002392	0003672	0004695	0005755	0006782	00078
0000430 93	0001588 0008942	0002397	0003677	0004701	0005764	0006784	00078
0000433 94	0001592 0008944	0002400	0003679	0004705	0005767	0006785	00078
0000434 96	0001596 0008949	0002408	0003680	0004734	0005769	0006787	00078
0000436 99	0001602 0008950	0002422	0003683	0004751	0005771	0006789	00078
0000441 05	0001606 0008953	0002431	0003692	0004752	0005772	0006790	00079
0000442 06	0001608 0008961	0002443	0003698	0004766	0005788	0006801	00079
0000444 08	0001612 0009000	0002449	0003700	0004767	0005792	0006804	00079
0000446 10	0001613 0009007	0002468	0003701	0004770	0005795	0006810	00079
0000447 16	0001616 0009012	0002479	0003704	0004771	0005805	0006842	00079
0000449 22	0001618 0009033	0002501	0003709	0004774	0005808	0006843	00079
0000450 26	0001621 0009050	0002505	0003716	0004776	0005809	0006847	00079
0000453 31	0001624 0009053	0002533	0003717	0004777	0005813	0006851	00079
0000456 34	0001629 0009058	0002536	0003719	0004778	0005817	0006864	00079
0000457 36	0001630 0009062	0002539	0003723	0004788	0005842	0006883	00079
0000460 37	0001640 0009073	0002551	0003727	0004790	0005859	0006906	00079
0000463 40	0001646 0009074	0002558	0003735	0004794	0005860	0006909	00079
0000464 55	0001648 0009076	0002567	0003741	0004797	0005861	0006915	00079
0000466 66	0001650 0009080	0002571	0003753	0004798	0005863	0006923	00079
0000467 69	0001651 0009089	0002582	0003754	0004799	0005864	0006931	00079
0000476 70	0001654 0009094	0002587	0003760	0004811	0005868	0006935	00079
0000480 78	0001655 0009095	0002589	0003762	0004814	0005869	0006942	00079
0000488 82	0001665 0009096	0002609	0003778	0004815	0005870	0006950	00079
0000498 86	0001670 0009102	0002616	0003783	0004823	0005872	0006954	00079
0000501	0001673	0002620	0003784	0004824	0005878	0006967	00079

87	0009105						
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91	0009120	0000040	0002001	0004026	0005000	0000000	00070
0000508 98	0001695 0009122	0002640	0003801	0004826	0005889	0006983	00079
0000509 03		0002647	0003803	0004840	0005902	0006986	08000
0000510	0001700	0002651	0003811	0004844	0005903	0006988	08000
06 0000512 11	0009138 0001703 0009144	0002655	0003829	0004851	0005904	0006990	00080
0000531	0001704	0002660	0003836	0004852	0005906	0006991	00080
13 0000548		0002684	0003837	0004853	0005907	0006993	08000
30 0000573	0009148 0001715	0002688	0003839	0004862	0005909	0006994	00080
36	0009152	0000000	0000040	0004067	0005011	0007004	00000
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0000580	0001746	0002694	0003867	0004873	0005925	0007007	08000
52 0000595	0009156 0001754	0002696	0003892	0004923	0005927	0007011	00080
53	0001734	0002030	0003032	0004923	0003327	0007011	00000
0000597 55	0001757 0009163	0002698	0003893	0004926	0005946	0007024	08000
0000606	0001778	0002704	0003900	0004933	0005947	0007029	00080
56 0000608	0009168 0001782	0002710	0003901	0004934	0005955	0007030	00080
61	0001782	0002710	0003901	0004934	0003933	0007030	00000
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67 0000620	0009178 0001793	0002716	0003917	0004937	0005959	0007034	00080
70	0009179						
0000635 73	0001794 0009182	0002725	0003923	0004944	0005961	0007048	08000
0000640	0001800	0002737	0003924	0004951	0005974	0007055	08000
83 0000643	0009183 0001803	0002738	0003929	0004954	0005978	0007057	00080
84	0009189	0000740	0000001	0004073	0005070	0007065	00000
0000648 87	0001805 0009192	0002740	0003934	0004972	0005979	0007065	08000
0000669		0002746	0003936	0004974	0005981	0007069	08000
89 0000670		0002758	0003939	0004986	0005988	0007072	08000
90 0000686	0009200 0001814	0002759	0003940	0004987	0005990	0007077	00080
93	0001014	0002739	0003940	0004907	0003990	0007077	00000
0000690 94	0001815 0009205	0002764	0003941	0004988	0005996	0007082	08000
0000691	0001817	0002765	0003944	0005002	0005998	0007083	00080
95	0009206	0002766	0002045	0005007	0005000	0007006	00000
0000700 96	0001819 0009210	0002766	0003945	0005007	0005999	0007086	08000
0000704		0002771	0003946	0005016	0006035	0007088	00081
02 0000722	0009215 0001831	0002796	0003947	0005028	0006037	0007092	00081
12	0009227						
0000727 14	0001839 0009235	0002797	0003955	0005045	0006038	0007098	00081
0000730 19		0002804	0003959	0005059	0006047	0007099	00081

0000757 32	0001864 0009249	0002811	0003961	0005060	0006075	0007108	00081
0000761 35	0001870 0009252	0002813	0003969	0005063	0006093	0007111	00081
0000765 41		0002816	0003970	0005067	0006097	0007115	00081
0000768	0001872	0002821	0003973	0005070	0006098	0007130	00081
42 0000770	0009263 0001874	0002826	0003982	0005076	0006099	0007131	00081
43 0000774	0009269 0001878	0002860	0003988	0005078	0006107	0007137	00081
44 0000778	0009270 0001880	0002875	0003993	0005083	0006112	0007141	00081
55 0000780	0009274 0001885	0002881	0003994	0005099	0006114	0007150	00081
59	0009275						
0000806 82	0001891 0009276	0002890	0004002	0005103	0006118	0007154	00081
0000808 85	0001893 0009277	0002891	0004003	0005111	0006125	0007155	00081
0000814 96		0002893	0004005	0005115	0006129	0007169	00081
0000815	0001900	0002897	0004006	0005126	0006140	0007181	00082
18 0000822	0009283 0001904	0002901	0004007	0005130	0006145	0007186	00082
28 0000832	0009284 0001905	0002902	0004008	0005131	0006147	0007187	00082
42 0000844	0009286 0001908	0002904	0004013	0005135	0006156	0007189	00082
46 0000857	0009287 0001909	0002906	0004024	0005136	0006159	0007198	00082
47	0001303	0002900	0004024	0003130	0000133	0007130	00002
0000896 49	0001911 0009319	0002908	0004031	0005137	0006160	0007244	00082
0000897	0001912	0002920	0004046	0005143	0006161	0007245	00082
51 0000904		0002929	0004084	0005147	0006170	0007247	00082
55 0000907	0009365 0001915	0002931	0004095	0005159	0006188	0007264	00082
60 0000936	0009388 0001918	0002934	0004096	0005164	0006189	0007275	00082
61	0009392						
0000938 81	0001954 0009393	0002936	0004097	0005173	0006195	0007286	00082
0000947 82	0001963 0009403	0002946	0004104	0005191	0006198	0007293	00082
0000950 84		0002948	0004109	0005204	0006205	0007314	00082
0000953	0001972	0002951	0004110	0005211	0006208	0007318	00082
96 0000956	0009407 0001974	0002952	0004112	0005215	0006209	0007327	00083
00 0000990	0009408 0001979	0002953	0004117	0005216	0006210	0007331	00083
04	0001979	0002933	0004117	0003210	0000210	0007551	00003
0001002 09	0001982 0009422	0002961	0004122	0005221	0006224	0007334	00083
0001005	0001983	0002979	0004124	0005225	0006227	0007338	00083
10 0001007	0009444 0001985	0002983	0004134	0005227	0006242	0007343	00083
13 0001016	0009452 0001986	0002984	0004137	0005232	0006244	0007344	00083
		-	_			•	

17	0000456						
17 0001020	0009456 0001995	0002986	0004143	0005235	0006249	0007349	00083
21	0009460	000_000		0000			
0001028	0001997	0002999	0004144	0005238	0006250	0007352	00083
25 0001031	0009461 0002000	0003001	0004145	0005244	0006251	0007358	00083
28	0002000	0003001	0004143	0003244	0000231	0007336	00003
0001032	0002002	0003007	0004149	0005265	0006257	0007359	00083
33	0009470						
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45	0009484	0005010	0001201	0005200	0000207	0007501	00005
0001053	0002010	0003025	0004166	0005289	0006269	0007368	00083
48 0001056	0009489 0002012	0003028	0004173	0005309	0006283	0007374	00083
51	0002012	0003020	0004173	0003309	0000203	0007374	00003
0001057	0002019	0003041	0004182	0005311	0006293	0007391	00083
54	0009502						
0001058 55	0002021 0009508	0003047	0004193	0005317	0006294	0007395	00083
0001060	0002022	0003048	0004196	0005318	0006296	0007403	00083
56	0009512			00000	0000_00		
0001063	0002025	0003050	0004197	0005319	0006306	0007414	00083
59 0001065	0009515 0002029	0003067	0004199	0005331	0006313	0007422	00083
69	0002029	0003007	0004133	0003331	0000313	0007422	00003
0001066	0002030	0003071	0004201	0005338	0006315	0007425	00083
71	0009519	0000074	0004215	0005240	0000000	0007420	00000
0001070 72	0002031 0009530	0003074	0004215	0005340	0006322	0007430	00083
0001075	0002032	0003086	0004217	0005344	0006327	0007438	00083
75	0009541						
0001076 85	0002035 0009547	0003094	0004222	0005347	0006331	0007442	00083
0001088	0002039	0003108	0004225	0005352	0006332	0007444	00083
89	0009549						
0001095	0002043	0003119	0004226	0005357	0006337	0007446	00083
90 0001099	0009551 0002049	0003128	0004227	0005362	0006339	0007452	00083
94	0002049	0003120	0004227	0003302	0000339	0007432	00003
0001101	0002052	0003130	0004234	0005364	0006342	0007506	00083
95	0009556	0002140	0004227	0005360	0006244	0007500	00002
0001102 98	0002054 0009557	0003140	0004237	0005368	0006344	0007508	00083
0001103	0002063	0003147	0004240	0005369	0006345	0007521	00084
00	0009565						
0001112 28	0002065 0009576	0003158	0004242	0005377	0006354	0007523	00084
0001120	0002072	0003159	0004243	0005381	0006358	0007538	00084
33	0009584			-			
0001127	0002073	0003181	0004245	0005384	0006361	0007545	00084
38 0001128	0002074	0003186	0004247	0005391	0006362	0007562	00084
50	0002074	0003100	0004247	0003391	0000302	0007302	00004
0001129	0002076	0003188	0004249	0005401	0006367	0007584	00084
51	0000000	0002100	0004252	0005405	0000077	0007505	00004
0001134 63	0002083	0003189	0004262	0005405	0006372	0007595	00084
0001137	0002084	0003197	0004263	0005409	0006376	0007596	00084
64							

Algún archivo

In [1]:

!cat data/training/acq/0000005

Dataset: CPU

In [6]:

!ls data/training/cpu

0003746 0003797 0003816

Buscar más Frecuentes

```
In [7]:
```

```
import os
trainingFiles = []
for root, dirs, files in os.walk("data/training"):
    for file in files:
         trainingFiles.append([root, file])
trainingFiles[0:10]
Out[7]:
[['data/training/naphtha', '0004556'],
 ['data/training/naphtha',
                                '0005167'],
 ['data/training/soybean', '0004358'],
 ['data/training/soybean', '0008468'], ['data/training/soybean', '0000885'],
 ['data/training/soybean', '0002152'],
 ['data/training/soybean', '0001505'],
 ['data/training/soybean', '0001131'], ['data/training/soybean', '0005250'],
 ['data/training/soybean', '0006770']]
```

Agrupar

In [8]:

```
import pandas as pd
```

```
In [9]:
```

```
labels = ['root', 'file']
df = pd.DataFrame.from_records(trainingFiles, columns=labels)
```

In [10]:

df[0:10]

Out[10]:

	root	file
0	data/training/naphtha	0004556
1	data/training/naphtha	0005167
2	data/training/soybean	0004358
3	data/training/soybean	0008468
4	data/training/soybean	0000885
5	data/training/soybean	0002152
6	data/training/soybean	0001505
7	data/training/soybean	0001131
8	data/training/soybean	0005250
9	data/training/soybean	0006770

In [11]:

df.describe()

Out[11]:

	root	file
count	11413	11413
unique	91	9598
top	data/training/earn	0000167
freq	2877	15

GroupBy

In [12]:

df.groupby('root').describe()

	file			
	count	unique	top	freq
root				
data/training/acq	1650	1650	0008228	1
data/training/alum	35	35	0006562	1
data/training/barley	37	37	0005296	1
data/training/bop	75	75	0007232	1
data/training/carcass	50	50	0003480	1
data/training/castor-oil	1	1	0007237	1
data/training/cocoa	55	55	0006724	1
data/training/coconut	4	4	0007537	1
data/training/coconut-oil	4	4	0006017	1
data/training/coffee	111	111	0007110	1
data/training/copper	47	47	0004030	1
data/training/copra-cake	2	2	0000167	1
data/training/corn	181	181	0002996	1
data/training/cotton	39	39	0001012	1
data/training/cotton-oil	1	1	0004459	1
data/training/cpi	69	69	0008538	1
data/training/cpu	3	3	0003797	1
data/training/crude	389	389	0008210	1
data/training/dfl	2	2	0007273	1
data/training/dlr	131	131	0007511	1
data/training/dmk	10	10	0002014	1
data/training/earn	2877	2877	0002387	1
data/training/fuel	13	13	0001919	1
data/training/gas	37	37	0008210	1
data/training/gnp	101	101	0007956	1
data/training/gold	94	94	0001527	1
data/training/grain	433	433	0003501	1
data/training/groundnut	5	5	0001490	1
data/training/groundnut-oil	1	1	0000222	1
data/training/heat	14	14	0008363	1
			2224242	

data/training/potato	3	3	0001242	1
	file			
	count	unique	top	freq
root				
data/training/propane	3	3	0000493	1
data/training/rand	2	2	0006570	1
data/training/rape-oil	5	5	0005713	1
data/training/rapeseed	18	18	0003141	1
data/training/reserves	55	55	0004016	1
data/training/retail	23	23	0003643	1
data/training/rice	35	35	0008181	1
data/training/rubber	37	37	0007882	1
data/training/rye	1	1	0000066	1
data/training/ship	197	197	0007474	1
data/training/silver	21	21	0008689	1
data/training/sorghum	24	24	0003919	1
data/training/soy-meal	13	13	0000045	1
data/training/soy-oil	14	14	0009255	1
data/training/soybean	78	78	0000885	1
data/training/strategic-metal	16	16	0001906	1
data/training/sugar	126	126	0008590	1
data/training/sun-meal	1	1	0008798	1
data/training/sun-oil	5	5	0002727	1
data/training/sunseed	11	11	0008613	1
data/training/tea	9	9	0007320	1
data/training/tin	18	18	0005895	1
data/training/trade	369	369	0004004	1
data/training/unknown	1830	1830	0000345	1
data/training/veg-oil	87	87	0000226	1
data/training/wheat	212	212	0002815	1
data/training/wpi	19	19	0003218	1
data/training/yen	45	45	0007586	1

21

21

0004895 1

data/training/zinc

Ordernar y sacar los 10

Los 11 en realidad, porque hay una categoría unkwown

In [13]:

```
largest = df.groupby('root').count().nlargest(11, columns="file")
largest
```

Out[13]:

	file
root	
data/training/earn	2877
data/training/unknown	1830
data/training/acq	1650
data/training/money-fx	538
data/training/grain	433
data/training/crude	389
data/training/trade	369
data/training/interest	347
data/training/wheat	212
data/training/ship	197
data/training/corn	181

In [14]:

largest.describe()

Out[14]:

	file
count	11.000000
mean	820.272727
std	891.546195
min	181.000000
25%	279.500000
50%	389.000000
75%	1094.000000
max	2877.000000

Iterate trough values:

```
In [15]:
for row in df.iterrows():
    print(row[0], row[1]["root"], row[1]["file"])
    break
0 data/training/naphtha 0004556
In [16]:
for row in largest.iterrows():
    print(row[0], row[1]["file"])
data/training/earn 2877
data/training/unknown 1830
data/training/acq 1650
data/training/money-fx 538
data/training/grain 433
data/training/crude 389
data/training/trade 369
data/training/interest 347
data/training/wheat 212
data/training/ship 197
data/training/corn 181
Refactor
```

```
In [17]:
```

```
path = "data/training"
def getAllFiles(path):
    allFiles = []
    for root, dirs, files in os.walk(path):
        for file in files:
            allFiles.append([root, file])
    return allFiles
```

```
In [18]:
```

```
def getTop10Categories(files):
    labels = ['root', 'file']
    df = pd.DataFrame.from records(files, columns=labels)
    largest = df.groupby('root').count().nlargest(11, columns="file")
    return [[row[0], row[1]["file"]] for row in largest.iterrows() if "unknown"
not in row[0]]
```

```
In [19]:
```

```
def getFilesInFolders(folderList):
    allFiles = []
    for folder in folderList:
        for root, dirs, files in os.walk(folder):
            for file in files:
                allFiles.append([root, file])
return allFiles
```

In [20]:

```
def concatFiles(allFiles):
    return [str(r[0])+ "/" + str(r[1]) for r in allFiles]
```

Preview

All Files

In [21]:

```
trainingFiles = getAllFiles("data/training")
print(len(trainingFiles))
print(trainingFiles[0])
```

11413 ['data/training/naphtha', '0004556']

Top 10 Categories

In [22]:

```
top10 = getTop10Categories(trainingFiles)
print(len(top10))
print(top10[0])
```

10
['data/training/earn', 2877]

Top 10 Folders

```
In [23]:
top10Folders = [f[0] for f in top10]
top10Folders
Out[23]:
['data/training/earn',
 'data/training/acq',
 'data/training/money-fx',
 'data/training/grain',
 'data/training/crude',
 'data/training/trade',
 'data/training/interest',
 'data/training/wheat',
 'data/training/ship',
 'data/training/corn']
Top 10 Files
In [24]:
top10Files = getFilesInFolders(top10Folders)
print(len(top10Files))
print("\n".join(concatFiles(top10Files)[::500]))
7193
data/training/earn/0006903
data/training/earn/0001638
data/training/earn/0000416
data/training/earn/0003049
data/training/earn/0001883
data/training/earn/0006551
data/training/acq/0004263
data/training/acq/0007759
data/training/acq/0005147
data/training/acq/0004862
data/training/money-fx/0007282
data/training/crude/0005910
data/training/trade/0003619
data/training/interest/0000568
data/training/ship/0009439
Check 'earn' Length
In [25]:
earnList = [r for r in top10Files if "earn" in r[0]]
len(earnList)
Out[25]:
```

Eliminar signos de puntuación

2877

In [26]:

```
testFile = os.path.join(trainingFiles[0][0], trainingFiles[0][1])
testFile
```

Out[26]:

'data/training/naphtha/0004556'

In [27]:

```
testFileOpen = open(testFile, "r")
testText = testFileOpen.read()
testFileOpen.close()
print(testText)
```

PAKISTAN-SWEDISH GOODS EXCHANGE AGREED

ISLAMABAD, March 18 - Pakistan and Sweden have signed a commodity exchange agreement for 88 mln dlrs each way, the Pakistan government announced.

Pakistan's exports under the agreement will include raw cotton, cotton products, cotton textiles, steel products, molasses, naphtha and fresh and dried fruits.

Swedish exports to Pakistan will include medical and laboratory equipment, electrical telecommunication equipment, diesel engine spares, mining and security equipment, road-building and construction machinery, fertilisers and palm oil.

Fuerza bruta

```
In [28]:
```

```
puntuacion = [",", ".", ";", ":", "<", ">", "-"]
```

In [29]:

```
sinPuntos = testText

for punto in puntuacion:
    sinPuntos = sinPuntos.replace(punto, "")

print(sinPuntos)
```

PAKISTANSWEDISH GOODS EXCHANGE AGREED

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Pakistan's exports under the agreement will include raw cotton cotton products cotton textiles steel products molasses naphtha and fresh and dried fruits

Swedish exports to Pakistan will include medical and laboratory equipment electrical telecommunication equipment diesel engine spares mining and security equipment roadbuilding and construction machinery fertilisers and palm oil

Problemas de este método:

- Tener todos los signos de puntuación en el arreglo
- Eficiencia

Expresiones regulares

In [30]:

import re, string

In [31]:

```
sinPuntos = testText

regex = re.compile('[%s]' % re.escape(string.punctuation))
sinPuntos = regex.sub('', sinPuntos)

print(sinPuntos)
```

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String Translate

```
In [32]:
```

```
string.punctuation

Out[32]:
'!"#$%&\'()*+,-./:;<=>?@[\\]^_`{|}~'

In [33]:

sinPuntos = testText
sinPuntos = sinPuntos.translate(str.maketrans('','', string.punctuation))
print(sinPuntos)
```

PAKISTANSWEDISH GOODS EXCHANGE AGREED

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Pakistans exports under the agreement will include raw cotton cotton products cotton textiles steel products molasses naphtha and fresh and dried fruits

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Comparación

Source (https://stackoverflow.com/questions/265960/best-way-to-strip-punctuation-from-a-string-in-python)

replace : 28.4436721802 regex : 6.86155414581 translate : 2.12455511093

Eliminar números

In [341:

```
sinNumeros = re.sub('\d', '', sinPuntos)
print(sinNumeros)
```

PAKISTANSWEDISH GOODS EXCHANGE AGREED

ISLAMABAD March Pakistan and Sweden have signed a commodity exchange agreement for mln dlrs each way the Pakistan government announced

Pakistans exports under the agreement will include raw cotton cotton products cotton textiles steel products molasses naphtha and fresh and dried fruits

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Eliminar Stopwords

Al igual que en el caso anterior, podríamos crear un arreglo y eliminar los stopwords. Una vez más, tendríamos que construir (o <u>descargar (https://github.com/stopwords-iso/stopwords-en)</u>) un listado de estas.

Para este caso, ocuparemos el Natural Language Toolkit (http://www.nltk.org/) para hacer esto.

In [35]:

from nltk.corpus import stopwords

```
In [36]:
stop = set(stopwords.words('english'))
list(stop)[0:10]
Out[36]:
['have',
 'into',
 'them',
 'which',
 'through',
 'those',
 'isn',
 'until',
 'that',
 'but'l
In [37]:
sinStop = [i for i in sinNumeros.lower().split() if i not in stop]
print(" ".join(sinStop))
```

pakistanswedish goods exchange agreed islamabad march pakistan swede n signed commodity exchange agreement mln dlrs way pakistan governme nt announced pakistans exports agreement include raw cotton cotton p roducts cotton textiles steel products molasses naphtha fresh dried fruits swedish exports pakistan include medical laboratory equipment electrical telecommunication equipment diesel engine spares mining s ecurity equipment roadbuilding construction machinery fertilisers palm oil

Tokenize

```
In [38]:
    from nltk import word_tokenize
    import nltk
    nltk.download('punkt')

[nltk_data] Downloading package punkt to /home/clgadel/nltk_data...
[nltk_data] Package punkt is already up-to-date!

Out[38]:

True

In [39]:

tokenized = [i for i in word tokenize(sinNumeros.lower()) if i not in stop]
```

```
In [40]:
tokenized[0:20]
Out[40]:
['pakistanswedish',
 'goods',
 'exchange',
 'agreed',
 'islamabad',
 'march',
 'pakistan',
 'sweden',
 'signed',
 'commodity',
 'exchange',
 'agreement',
 'mln',
 'dlrs',
 'way',
 'pakistan',
 'government',
 'announced',
 'pakistans',
 'exports']
```

Stemming

```
In [41]:
```

```
from nltk.stem.porter import PorterStemmer
porter = PorterStemmer()
```

```
In [42]:
```

```
stemText = [porter.stem(i.lower()) for i in word_tokenize(sinNumeros) if i.lower
() not in stop]
```

```
In [43]:
stemText[0:20]
Out[43]:
['pakistanswedish',
 'good',
 'exchang',
 'agre',
 'islamabad',
 'march',
 'pakistan',
 'sweden',
 'sign',
 'commod',
 'exchang',
 'agreement',
 'mln',
 'dlr',
 'way',
 'pakistan',
 'govern',
 'announc'
 'pakistan',
 'export']
Refactor
In [44]:
def processDocument(document):
    sinPuntos = document.translate(str.maketrans('','', string.punctuation))
    sinNumeros = re.sub('\d', '', sinPuntos)
    stemText = [porter.stem(i.lower()) for i in word tokenize(sinNumeros) if i.l
ower() not in stop]
    return stemText
In [45]:
def readFile(filename):
    file = open(filename)
    try:
        read = file.read()
    except:
        print(filename)
    file.close()
    return read
In [46]:
def readProcessDocument(documentFilename):
    read = readFile(documentFilename)
    parsed = processDocument(read)
    return parsed
```

```
In [47]:
```

```
processDocument(testText)[0:20]
Out[47]:
['pakistanswedish',
 'good',
 'exchang',
 'agre',
 'islamabad',
 'march',
 'pakistan',
 'sweden',
 'sign',
 'commod',
 'exchang',
 'agreement',
 'mln',
 'dlr',
 'way',
 'pakistan',
 'govern',
 'announc'
 'pakistan',
 'export']
```

Refactor Extract Files

Ahora con la carpeta y una lista de las categorías. Tuve que cambiarlos porque los test podrían no tener los mismos Top 10 de frecuencia.

```
In [48]:
```

```
# Usage: getFilesInFolders("data/training", ["acq", "earn", "money-fx"])
def getFilesInFolders(path, folderList):
    allFiles = []
    for root, dirs, files in os.walk(path):
        if any(word in root for word in folderList):
            for file in files:
                allFiles.append([root, file])
return allFiles
```

```
In [49]:
```

```
categories = ["acq", "earn", "money-fx", "grain", "crude", "trade", "interest",
"ship", "wheat", "corn"]
```

Test

```
In [50]:
getFilesInFolders("data/training", categories)[::500]
Out[50]:
[['data/training/grain', '0000574'],
 ['data/training/crude', '0001269'],
 ['data/training/interest', '0001988'],
 ['data/training/acq', '0009235'],
 ['data/training/acq',
                          '0004109'],
 ['data/training/acq', '0001478'],
 ['data/training/trade', '0007488'],
['data/training/earn', '0006039'],
 ['data/training/earn',
 ['data/training/earn', '0005406'],
 ['data/training/earn', '0009218'],
['data/training/earn', '0004637'],
 ['data/training/earn', '0001089'],
 ['data/training/earn', '0006397'],
 ['data/training/corn', '0002244'],
```

Extract Files

['data/training/money-fx', '0007525']]

```
In [51]:
```

```
trainingFiles = getFilesInFolders("data/training", categories)
print(len(trainingFiles))
```

7193

Training Set

```
In [52]:
```

```
trainDocuments = [[filename.split("/")[2], readFile(filename)] for filename in c
oncatFiles(trainingFiles[::11])]
print(len(trainDocuments))
```

654

Training Data and Target

```
In [53]:
```

```
trainData = [content for file, content in trainDocuments]
trainTarget = [file for file, content in trainDocuments]
```

Preview

```
In [54]:
```

```
trainDocumentName = trainTarget[0]
trainDocumentText = trainData[0]
print(trainDocumentName, trainDocumentText)
```

grain

ZIMBABWE MAIZE HARVEST LOWER AFTER BUMPER CROPS HARARE, March 3

- Zimbabwe's maize crop in 1986/87 (April/ March) is likely to be slightly over 1.6 mln tonnes, against 1.83 mln in 1985/86, Grain Marketing Board figures show.

Maize exports for 1986/87 to January 31, 1987 totalled 315,000 tonnes, with about a further 40,000 tonnes expected to be exported in February and March, against 285,000 tonnes in 1985/86. Domestic usage is estimated at 650,000-900,000 tonnes, depending on how other crops are affected by current poor rains. Last year's consumption was around 700,000 tonnes.

Zimbabwe has around two mln stonnes of surplus maize in storage, accumulated after two years of bumper harvests.

Count Vectorizer

In [55]:

from sklearn.feature_extraction.text import CountVectorizer

In [56]:

count_vect = CountVectorizer(analyzer = processDocument)

Fit

In [57]:

count vect.fit(trainData);

Fit Vocabulary

In [58]:

print(count_vect.vocabulary_)

{'zimbabw': 5921, 'maiz': 3100, 'harvest': 2314, 'lower': 3048, 'bum per': 707, 'crop': 1226, 'harar': 2295, 'march': 3127, 'april': 285, 'like': 2975, 'slightli': 4798, 'mln': 3323, 'tonn': 5330, 'grain': 2196, 'market': 3138, 'board': 591, 'figur': 1925, 'show': 4730, 'ex port': 1827, 'januari': 2712, 'total': 5341, 'expect': 1811, 'februa ri': 1892, 'domest': 1519, 'usag': 5564, 'estim': 1760, 'depend': 13 78, 'affect': 97, 'current': 1255, 'poor': 3986, 'rain': 4190, 'las t': 2878, 'year': 5886, 'consumpt': 1118, 'around': 325, 'two': 544 2, 'stonn': 5003, 'surplu': 5108, 'storag': 5008, 'accumul': 40, 'cc c': 837, 'accept': 30, 'wheat': 5764, 'bid': 556, 'w': 5670, 'afric a': 102, 'countri': 1189, 'washington': 5706, 'commod': 1031, 'credit': 1215, 'corport': 1162, 'bonu': 605, 'cover': 1197, 'sale': 4540, 'us': 5562, 'west': 5752, 'african': 103, 'agricultur': 120, 'depar t': 1375, 'said': 4530, 'dark': 1292, 'northern': 3559, 'spring': 49 17, 'shipment': 4711, 'may': 3168, 'june': 2770, 'dlr': 1491, 'per': 3870, 'made': 3090, 'peavey': 3852, 'compani': 1040, 'paid': 3767, 'form': 2010, 'inventori': 2653, 'addit': 66, 'still': 4990, 'avai l': 402, 'enhanc': 1700, 'program': 4088, 'initi': 2589, 'announc': 247, 'octob': 3617, 'canada': 759, 'corn': 1155, 'decis': 1327, 'unj ustifi': 5512, 'yeutter': 5899, 'trade': 5355, 'repres': 4350, 'clay ton': 954, 'find': 1934, 'today': 5313, 'import': 2520, 'injur': 259 1, 'canadian': 760, 'farmer': 1869, 'small': 4809, 'inconceiv': 254 3, 'reason': 4242, 'measur': 3197, 'statement': 4958, 'follow': 198 8, 'lead': 2904, 'could': 1178, 'result': 4386, 'rash': 4213, 'prote ctionist': 4110, 'action': 57, 'throughout': 5279, 'world': 5849, 'f rench': 2053, 'grower': 2232, 'recent': 4253, 'indic': 2560, 'challe ng': 866, 'gluten': 2158, 'feed': 1896, 'europ': 1768, 'examin': 178 7, 'close': 971, 'believ': 521, 'base': 476, 'fact': 1845, 'care': 7 89, 'evalu': 1771, 'appropri': 281, 'respons': 4377, 'say': 4575, 's tep': 4975, 'take': 5156, 'pl': 3938, 'hondura': 2422, 'usda': 5569, 'unit': 5510, 'state': 4956, 'sign': 4749, 'public': 4135, 'law': 28 90, 'agreement': 118, 'provid': 4115, 'worth': 5856, 'wheatwheat': 5 767, 'flour': 1975, 'cornsorghum': 1157, 'tallow': 5162, 'suppli': 5 102, 'fiscal': 1946, 'end': 1682, 'septemb': 4657, 'privat': 4067, 'trader': 5357, 'competit': 1049, 'basi': 478, 'purchas': 4143, 'aut hor': 393, 'issu': 2681, 'acr': 52, 'idl': 2494, 'would': 5858, 'lit tl': 2998, 'impact': 2513, 'acreag': 53, 'prompt': 4099, 'cropland': 1227, 'everi': 1778, 'accord': 35, 'report': 4349, 'save': 4572, 'lo an': 3010, 'transport': 5377, 'defici': 1344, 'payment': 3833, 'asss ess': 357, 'propos': 4106, 'cotton': 1177, 'sorghum': 4858, 'barle y': 471, 'almost': 177, 'likelihood': 2976, 'provisiion': 4119, 'cau s': 822, 'larg': 2871, 'remov': 4328, 'product': 4083, 'quit': 4178, 'return': 4397, 'typic': 5456, 'farm': 1868, 'favor': 1878, 'partici p': 3804, 'usual': 5577, 'reduct': 4274, 'seed': 4630, 'permit': 388 0, 'allow': 173, 'forego': 1998, 'plant': 3944, 'receiv': 4252, 'pc t': 3844, 'use': 5571, 'produc': 4082, 'high': 2376, 'productionhig h': 4084, 'risk': 4437, 'area': 303, 'cost': 1171, 'keith': 2791, 'c ollin': 1002, 'director': 1439, 'econom': 1613, 'analysi': 226, 'sta ff': 4937, 'heart': 2338, 'belt': 527, 'get': 2136, 'much': 3409, 'o ne': 3659, 'ildl': 2500, 'equival': 1734, 'bushel': 719, 'bale': 43 9, 'determin': 1403, 'whether': 5770, 'need': 3469, 'weigh': 5735, 'cash': 809, 'rate': 4214, 'price': 4057, 'rise': 4435, 'level': 294 4, 'reduc': 4273, 'also': 186, 'must': 3422, 'consid': 1106, 'your': 5904, 'give': 2148, 'differ': 1425, 'low': 3047, 'greater': 2207, 'a ppli: 275, 'pay': 3830, 'variabl': 5600, 'cicumst': 927, 'want': 5689, 'go': 2166, 'along': 180, 'attract': 378, 'incent': 2533, 'admi t': 79, 'margin': 3131, 'first': 1941, 'toward': 5347, 'goal': 2167, 'separ': 4655, 'govern': 2186, 'speech': 4897, 'earlier': 1598, 'nat ion': 3443, 'associ': 356, 'secretari': 4625, 'richard': 4418, 'lyn g': 3079, 'late': 2882, 'implement': 2518, 'sinc': 4763, 'signup': 4 753, 'month': 3361, 'ec': 1611, 'set': 4665, 'licenc': 2959, 'pari':

```
3792, 'european': 1769, 'commun': 1035, 'commiss': 1024, 'award': 41
3, 'free': 2047, 'maximum': 3167, 'rebat': 4244, 'currenc': 1254, 'e
cu': 1617, 'sourc': 4864, 'request': 4356, 'reject': 4313, 'sharp':
4691, 'drop': 1560, 'chicago': 897, 'analyst': 227, 'modest': 3342,
'declin': 1329, 'soybean': 4880, 'intent': 2620, 'due': 1577, 'est':
1757, 'gmt': 2163, 'averag': 404, 'guess': 2251, 'rang': 4205, 'well': 5743, 'improv': 2524, 'retir': 4394, 'pik': 3926, 'introduc': 26
48, 'quesstim': 4169, 'compar': 1044, 'substanti': 5056, 'stock': 49
95, 'less': 2937, 'interest': 2628, 'express': 1830, 'among': 214,
'schedul': 4584, 'eep': 1626, 'tactic': 5149, 'tool': 5333, 'gener': 2124, 'polici': 3975, 'comment': 1018, 'question': 4171, 'expand': 1
808, 'soviet': 4875, 'union': 5508, 'directli': 1438, 'repli': 4347,
'highest': 2379, 'reagan': 4233, 'administr': 76, 'dont': 1528, 'pre
empt': 4029, 'told': 5318, 'continu': 1128, 'select': 4636, 'succes s': 5063, 'pressur': 4047, 'beghinsay': 510, 'increas': 2547, 'capi
t': 777, 'financ': 1931, 'expans': 1809, 'sugar': 5068, 'group': 222
9, 'own': 3753, 'itali': 2685, 'gruppo': 2238, 'ferruzzi': 1910, 'ra
is': 4195, 'franc': 2037, 'threeforon': 5273, 'share': 4689, 'inves
t': 2654, 'certif': 859, 'presid': 4043, 'jeanmarc': 2724, 'vern': 5
615, 'stage': 4939, 'new': 3485, 'bring': 666, 'billion': 567, 'fun
d': 2086, 'plan': 3942, 'includ': 2539, 'possibl': 4002, 'acquisit': 51, 'starch': 4953, 'haubourdin': 2318, 'sever': 4672, 'buy': 724, 'instal': 2607, 'apart': 268, 'three': 5270, 'factori': 1847, 'germa
ni': 2134, 'britain': 668, 'spain': 4884, 'netherland': 3479, 'denma
rk': 1369, 'put': 4149, 'tag': 5151, 'fail': 1852, 'acquir': 50, 'de
velop': 1409, 'either': 1640, 'sector': 4627, 'kaysersberg': 2787,
'subsidiari': 5053, 'anoth': 251, 'major': 3101, 'transform': 5370,
'divis': 1489, 'fullyfledg': 2082, 'chemic': 889, 'hold': 2415, 'tal
k': 5161, 'ad': 61, 'onto': 3672, 'bours': 624, 'near': 3456, 'futur': 2093, 'asc': 339, 'seek': 4631, 'offer': 3623, 'process': 4080,
'rough': 4481, 'rice': 4417, 'kansa': 2780, 'citi': 942, 'stabil': 4
933, 'conserv': 1105, 'servic': 4662, 'corpor': 1161, 'deliv': 1357, 'pound': 4013, 'mill': 3283, 'spokesman': 4907, 'cdt': 840, 'offero
r': 3624, 'notifi': 3570, 'mge': 3248, 'start': 4954, 'hfc': 2373,
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```
In [59]:
X_train_counts = count_vect.transform(trainData)

In [132]:
print(X_train_counts.shape)
print(X_train_counts.toarray())

(654, 5932)
[[0 0 0 ..., 0 0 0]
[0 0 0 ..., 0 0 0]
[0 0 0 ..., 0 0 0]
...,
[0 0 0 ..., 0 0 0]
[0 0 0 ..., 0 0 0]
[0 0 0 ..., 0 0 0]
```

Visualizar

In [134]:

countMatrix = pd.DataFrame.from_records(X_train_counts.toarray())
countMatrix

	^	1	2	2	А	_	c	7	0	_		E022	E022	E024	EOSE	EOOC	E027	E020	EOC
	0	1	2	3	4	5	6	7	8	9		5922	5923	5924	5925	5926	5927	5928	592
0	0	0	0	0	0	0	0	0	0	0		0		0		0	0		0
1	0	0	0	0	0	0	0	0	0	0	•••	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	•••	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	•••	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	•••	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	•••	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	•••	0	0	0	0	0	0	0	0
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12	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	•••	0	0	0	0	0	0	0	0
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18	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
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21	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	1	0	0
24	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
624	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
625	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
	_	_	_	_	_	_	_	^	_	_		_	_	_	_	_	_	_	_

626	U	U	U	U	U	U	U	U	U	U	 U	U	U	U	U	U	U	U
	0	1	2	3	4	5	6	7	8	9	 5922	5923	5924	5925	5926	5927	5928	592
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628	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
629	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
630	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
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633	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	1	0	0	0
634	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
635	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	1	0	0	0
636	0	0	0	0	0	0	0	0	1	0	 0	0	0	0	0	0	0	0
637	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
638	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
639	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
640	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
641	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
642	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
643	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
644	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
645	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
646	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
647	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
648	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
649	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
650	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
651	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
652	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0
653	0	0	0	0	0	0	0	0	0	0	 0	0	0	0	0	0	0	0

654 rows × 5932 columns

Visualize (2)

In [138]:

```
import matplotlib.pyplot as plt
from matplotlib.pyplot import figure, show
```

In [142]:

```
plt.figure(figsize=(40,40))
plt.spy(X_train_counts.toarray())
plt.show()
```



De la imagen se puede apreciar que hay palabras que al parecer están en muchos de los documentos.

Es posible que no se haya aplicado el analiyzer de forma correcta.

Se procederá a buscar cuales son las palabras que más incidencia tienen.

Más frecuentes

```
In [195]:
```

```
countMatrix.sum().nlargest(30)
Out[195]:
4530
        1637
3323
        1262
5663
         902
1491
         820
3127
         670
1243
         539
5886
         492
         474
3844
5562
         423
3477
         396
3036
         383
1040
         364
457
         325
4689
         325
4733
         318
567
         317
5355
         284
3138
         271
2531
         263
4086
         260
5858
         255
3636
         224
3485
         214
2878
         211
285
         206
4057
         204
1160
         200
3659
         197
3678
         196
4540
         196
dtype: int64
Más repetido
```

```
In [202]:
```

```
[k for k, v in count_vect.vocabulary_.items() if v == 4530]
Out[202]:
```

['said']

Todos los valores:

```
In [201]:
```

```
for index, data in countMatrix.sum().nlargest(30).iteritems():
    print([k for k, v in count_vect.vocabulary_.items() if v == index])
['said']
['mln']
['vs']
['dlr']
['march']
['ct']
['year']
['pct']
['us']
['net']
['loss']
['compani']
['bank']
['share']
['shr']
['billion']
['trade']
['market']
['inc']
['profit']
['would']
```

Algunas de las palabras encontradas son relevantes. Otras no tanto. Es dificil determinar de forma automática cuales palabras son importantes y cuales no. Se dejarán por el momento, sin embargo, se considera que su presencia debería afectar los resultados.

TF-iDF Transform

```
In [61]:
```

['oil']
['new']
['last']
['april']
['price']
['corp']
['one']
['oper']
['sale']

```
from sklearn.feature_extraction.text import TfidfTransformer
```

Fit and Transform

```
In [62]:
```

```
tfidf_transformer = TfidfTransformer()
X_train_tfidf = tfidf_transformer.fit_transform(X_train_counts)
X_train_tfidf.shape
```

Out[62]:

(654, 5932)

Visualize

```
In [203]:
```

```
plt.figure(figsize=(40,40))
plt.spy(X_train_tfidf.toarray())
plt.show()
```

Naive Bayes

In [63]:

```
from sklearn.naive_bayes import MultinomialNB
```

In [64]:

```
clf = MultinomialNB().fit(X_train_tfidf, trainTarget)
```

Test Predict

```
In [65]:
```

```
testFile = "data/test/money-fx/0009664"
```

In [66]:

```
testTarget = [testFile.split("/")[2]]
testData = [readFile(testFile)]
print(testTarget)
print(testData)
```

```
['money-fx']
```

["\n\nU.K. MONEY MARKET GIVEN 53 MLN STG ASSISTANCE\n\n LONDON, A pril 8 - The Bank of England said it provided the\nmoney market with 53 mln stg assistance in the morning session.\n This compares with the bank's estimate of a shortage in the\nsystem of around 300 mln stg which it earlier revised up from\n250 mln.\n The central bank made outright purchases of bank bills\ncomprising 46 mln stg in band three at 9-3/4 pct and seven mln\nstg in band four at 9-11/16 pct.\n\n"]

```
In [67]:
X new counts = count vect.transform(testData)
X_new_tfidf = tfidf_transformer.transform(X_new_counts)
In [68]:
predicted = clf.predict(X new tfidf)
In [69]:
for doc, category in zip(testTarget, predicted):
    print('%s => %s \n' % (doc, category))
money-fx => money-fx
Pipeline
In [70]:
from sklearn.pipeline import Pipeline
text_clf = Pipeline([('vect', CountVectorizer(analyzer = processDocument)),
                     ('tfidf', TfidfTransformer()),
                     ('clf', MultinomialNB()),
])
In [71]:
categories = ["acq", "earn", "money-fx", "grain", "crude", "trade", "interest",
"ship", "wheat", "corn"]
In [72]:
trainingFiles = getFilesInFolders("data/training", categories)
trainDocuments = [[filename.split("/")[2], readFile(filename)] for filename in c
oncatFiles(trainingFiles)]
trainData = [content for file, content in trainDocuments]
trainTarget = [file for file, content in trainDocuments]
In [73]:
testFiles = getFilesInFolders("data/test", categories)
testDocuments = [[filename.split("/")[2], readFile(filename)] for filename in co
ncatFiles(testFiles)]
testData = [content for file, content in testDocuments]
testTarget = [file for file, content in testDocuments]
```

```
In [74]:
text clf.fit(trainData, trainTarget)
Out[74]:
Pipeline(memory=None,
     steps=[('vect', CountVectorizer(analyzer=<function processDocum</pre>
ent at 0x7fee3111cd90>,
        binary=False, decode error='strict', dtype=<class 'numpy.int
64'>,
        encoding='utf-8', input='content', lowercase=True, max df=1.
0,
        max_features=None, min_df=1, ngram_range=(1, 1), preprocess
o...inear_tf=False, use_idf=True)), ('clf', MultinomialNB(alpha=1.0,
class prior=None, fit prior=True))])
In [76]:
predicted = text clf.predict(testData)
Comparar resultados
In [75]:
import numpy as np
In [95]:
np.mean(predicted == testTarget)
Out[95]:
0.79332615715823462
In [90]:
same = np.where(predicted == testTarget)
```

same: 2211 diff: 576

0.7394843962008142

different = np.where(predicted != testTarget)

print(1-int(len(different[0]))/int(len(same[0])))

print("same:", len(same[0]))
print("diff:", len(different[0]))

In [96]:

print(different)

```
(array([
            7,
                   10,
                          12,
                                 21,
                                        27,
                                               34,
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                775,
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                                     813,
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973,
         974,
                      1014, 1040, 1063, 1074, 1086, 1095, 1109, 1119, 1
143,
        1155, 1160, 1174, 1188, 1189, 1190, 1191, 1192, 1193, 1195, 1
198,
        1201, 1204, 1205, 1206, 1207, 1209, 1214, 1216, 1217, 1218, 1
225,
        1226, 1227, 1229, 1230, 1234, 1236, 1237, 1239, 1242, 1244, 1
245,
        1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1260, 1261, 1
266,
        1267, 1272, 1274, 1275, 1278, 1279, 1281, 1282, 1283, 1284, 1
287,
        1288, 1298, 1300, 1301, 1304, 1305, 1306, 1307, 1308, 1309, 1
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310,
       1311, 1312, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1
322,
       1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1
333,
       1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1
344,
       1345, 1346, 1347, 1348, 1349, 1351, 1352, 1353, 1354, 1355, 1
356,
       1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1
368,
       1369, 1370, 1371, 1372, 1373, 1374, 1376, 1377, 1378, 1379, 1
380,
       1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1
391,
       1392, 1393, 1707, 1759, 1855, 1972, 2124, 2129, 2369, 2405, 2
407,
       2445, 2446, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2
489,
       2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2
500,
       2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2
511,
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       2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2
566,
       2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2
577,
       2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2
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       2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2
599,
       2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2609, 2619, 2
620,
       2631, 2638, 2659, 2660, 2681, 2716, 2726, 2744, 2745, 2749, 2
753,
       2760, 2762, 2767, 2768]),)
```

Busqueda de diferencias

```
In [106]:
```

```
testSample = testFiles[7]
print(testSample)
```

```
['data/test/grain', '0012662']
```

```
In [107]:

testSampleTarget = [testSample[0].split("/")[2]]
testSampleData = [readFile("/".join(testSample))]
print(testSampleTarget)
print(testSampleData)

['grain']
['\n\nU.S. SENATE PANEL VOTES TO LIMIT COUNTY LOAN RATE CHANGES STA
RTING WITH 1988 CROPS\n\nBlah blah blah.\n\n\n']

In [108]:
predicted = text_clf.predict(testSampleData)

In [109]:

for doc, category in zip(testTarget, predicted):
    print('%s => %s \n' % (doc, category))

grain => earn
```

Refactor

In [126]:

```
def evaluateTestSample(testFiles, index):
    testSample = testFiles[index]
    print("Sample")
    print(testSample)
    print()
    testSampleTarget = [testSample[0].split("/")[2]]
    testSampleData = [readFile("/".join(testSample))]
    print(testSampleData)
    print()
    print("Predicted:")
    predicted = text_clf.predict(testSampleData)
    for doc, category in zip(testSampleTarget, predicted):
        print('%s => %s \n' % (doc, category))
```

evaluateTestSample(testFiles, 10)

Sample

['data/test/grain', '0011705']

['\n\nBANGLADESH NAVY UNLOADS GRAINS DURING PORT STRIKE\n\n AGONG, Bangladesh, June 19 - The navy is unloading\nfoodgrains at Ch ittagong port following a strike by nearly\n1,000 dockworkers, Bangl adesh Shipping Corp officials said.\n The navy was unloading 74,0 00 tonnes of foodgrains from two\nships today, and four vessels lade n with some 90,000 tonnes of\ngrains were waiting at the outer ancho rage, port officials\nsaid.\n A spokesman for the workers said th ey would continue their\nstrike until authorities agree to their dem ands for higher pay\nand other benefits. The strike began on June 1 "Unloading of grains and other essential commodities started \nnormally after we called in navy personnel to help," a port\noffic ial told Reuters.\n "The strike has caused no serious dislocatio n," he said.\n The government meanwhile declared the port jobs an \n"essential service" and said the strikers could be dismissed\nunle ss they end the strike soon.\n\n']

Predicted:
grain => ship