Massaging the data

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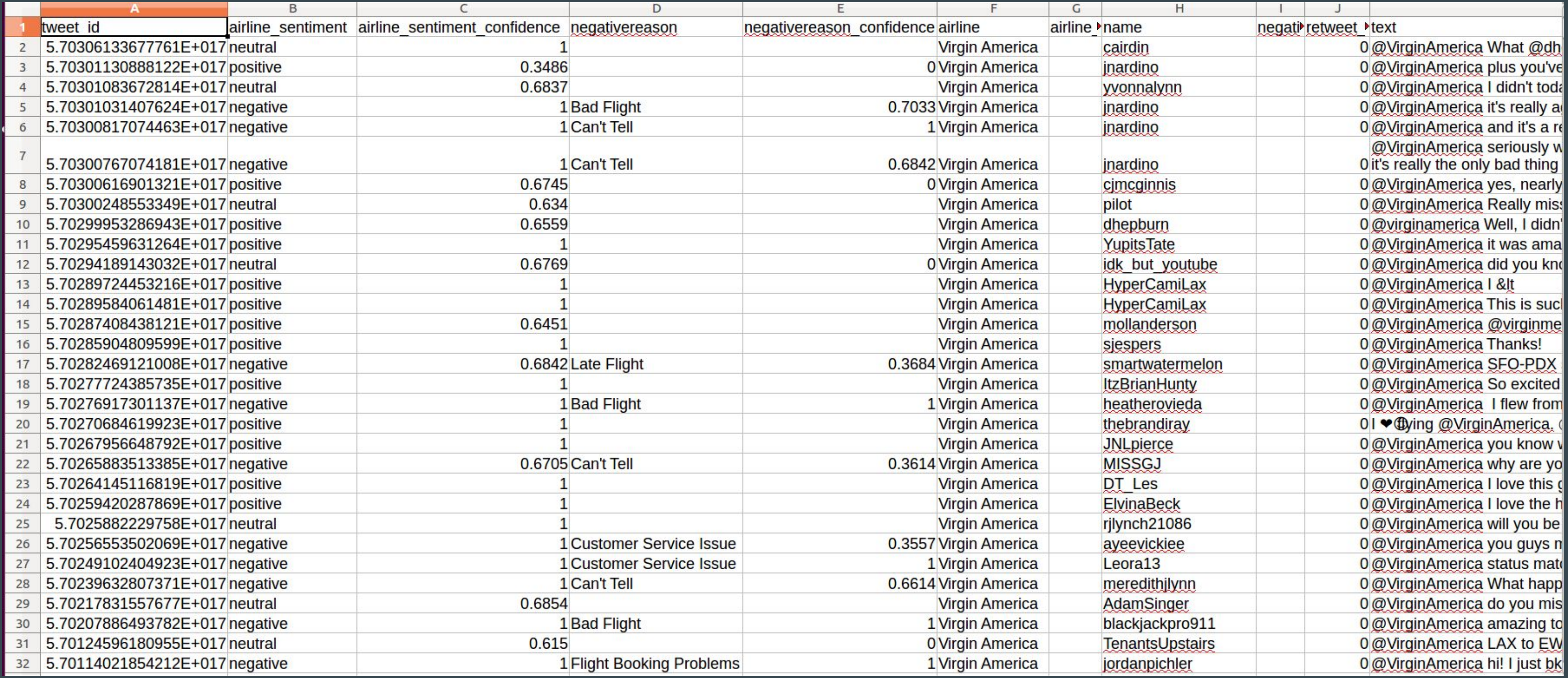
By Charlie Hill

Problem

- Flying can be traumatizing

Twitter Sentiment

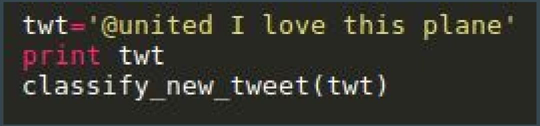


	A	B	C	D	E	F	G	H	I	J	
1	tweet_id	airline_sentiment	airline_sentiment_confidence	negativereason	negativereason_confidence	airline	airline_	name	negati	retweet_	text
2	5.70306133677761E+017	neutral	1			Virgin America		cairdin		0	@VirginAmerica What @dh
3	5.70301130888122E+017	positive	0.3486		0	Virgin America		jnardino		0	@VirginAmerica plus you've
4	5.70301083672814E+017	neutral	0.6837			Virgin America		yvonnalynn		0	@VirginAmerica I didn't toda
5	5.70301031407624E+017	negative	1	Bad Flight	0.7033	Virgin America		jnardino		0	@VirginAmerica it's really a
6	5.70300817074463E+017	negative	1	Can't Tell	1	Virgin America		jnardino		0	@VirginAmerica and it's a r
7	5.70300767074181E+017	negative	1	Can't Tell	0.6842	Virgin America		jnardino		0	@VirginAmerica seriously w it's really the only bad thing
8	5.70300616901321E+017	positive	0.6745		0	Virgin America		cjmcginnis		0	@VirginAmerica yes, nearly
9	5.70300248553349E+017	neutral	0.634			Virgin America		pilot		0	@VirginAmerica Really mis
10	5.70299953286943E+017	positive	0.6559			Virgin America		dhepburn		0	@virginamerica Well, I didn'
11	5.70295459631264E+017	positive	1			Virgin America		YupitsTate		0	@VirginAmerica it was ama
12	5.70294189143032E+017	neutral	0.6769		0	Virgin America		idk_but_youtube		0	@VirginAmerica did you kn
13	5.70289724453216E+017	positive	1			Virgin America		HyperCamiLax		0	@VirginAmerica I &lt
14	5.70289584061481E+017	positive	1			Virgin America		HyperCamiLax		0	@VirginAmerica This is suc
15	5.70287408438121E+017	positive	0.6451			Virgin America		mollanderson		0	@VirginAmerica @virginme
16	5.70285904809599E+017	positive	1			Virgin America		sjespers		0	@VirginAmerica Thanks!
17	5.70282469121008E+017	negative	0.6842	Late Flight	0.3684	Virgin America		smartwatermelon		0	@VirginAmerica SFO-PDX
18	5.70277724385735E+017	positive	1			Virgin America		ItzBrianHunty		0	@VirginAmerica So excited
19	5.70276917301137E+017	negative	1	Bad Flight	1	Virgin America		heatherovieda		0	@VirginAmerica I flew from
20	5.70270684619923E+017	positive	1			Virgin America		thebrandiray		0	I ❤flying @VirginAmerica.
21	5.70267956648792E+017	positive	1			Virgin America		JNLpierce		0	@VirginAmerica you know w
22	5.70265883513385E+017	negative	0.6705	Can't Tell	0.3614	Virgin America		MISSGJ		0	@VirginAmerica why are yo
23	5.70264145116819E+017	positive	1			Virgin America		DT_Les		0	@VirginAmerica I love this
24	5.70259420287869E+017	positive	1			Virgin America		ElvinaBeck		0	@VirginAmerica I love the h
25	5.7025882229758E+017	neutral	1			Virgin America		rjlynch21086		0	@VirginAmerica will you be
26	5.70256553502069E+017	negative	1	Customer Service Issue	0.3557	Virgin America		ayeevickiee		0	@VirginAmerica you guys m
27	5.70249102404923E+017	negative	1	Customer Service Issue	1	Virgin America		Leora13		0	@VirginAmerica status mat
28	5.70239632807371E+017	negative	1	Can't Tell	0.6614	Virgin America		meredithjlynn		0	@VirginAmerica What happ
29	5.70217831557677E+017	neutral	0.6854			Virgin America		AdamSinger		0	@VirginAmerica do you mis
30	5.70207886493782E+017	negative	1	Bad Flight	1	Virgin America		blackjackpro911		0	@VirginAmerica amazing to
31	5.70124596180955E+017	neutral	0.615		0	Virgin America		TenantsUpstairs		0	@VirginAmerica LAX to EW
32	5.70114021854212E+017	negative	1	Flight Booking Problems	1	Virgin America		jordanpichler		0	@VirginAmerica hi! I just bk

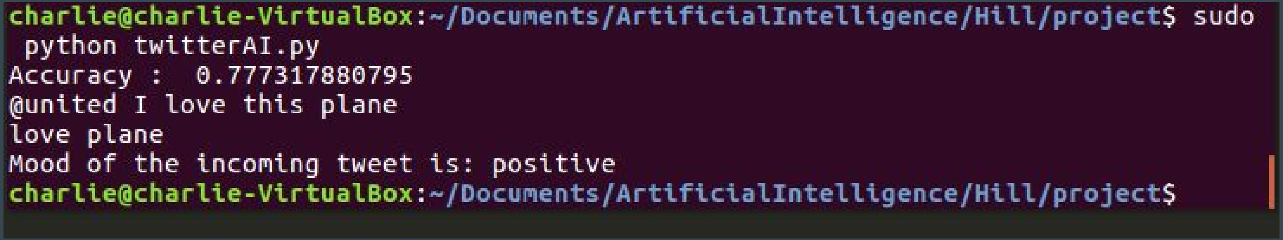
Massaging the data

- Natural Language Toolkit - nltk
- Tokenize, lemmatize and remove stopwords
- X becomes our parsed tweets
- Y becomes our sentiment
- Sklearn’s CountVectorizer and Transform methods
- Logistic Regression

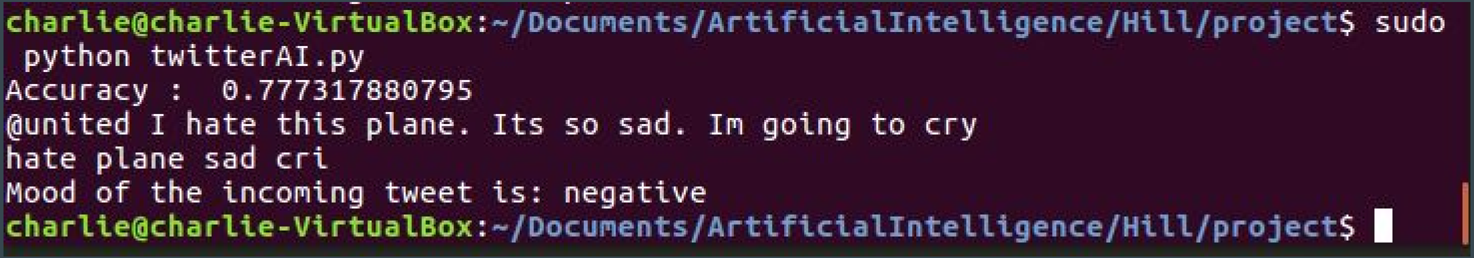
Current Output



```
twt='@united I love this plane'
print twt
classify_new_tweet(twt)
```

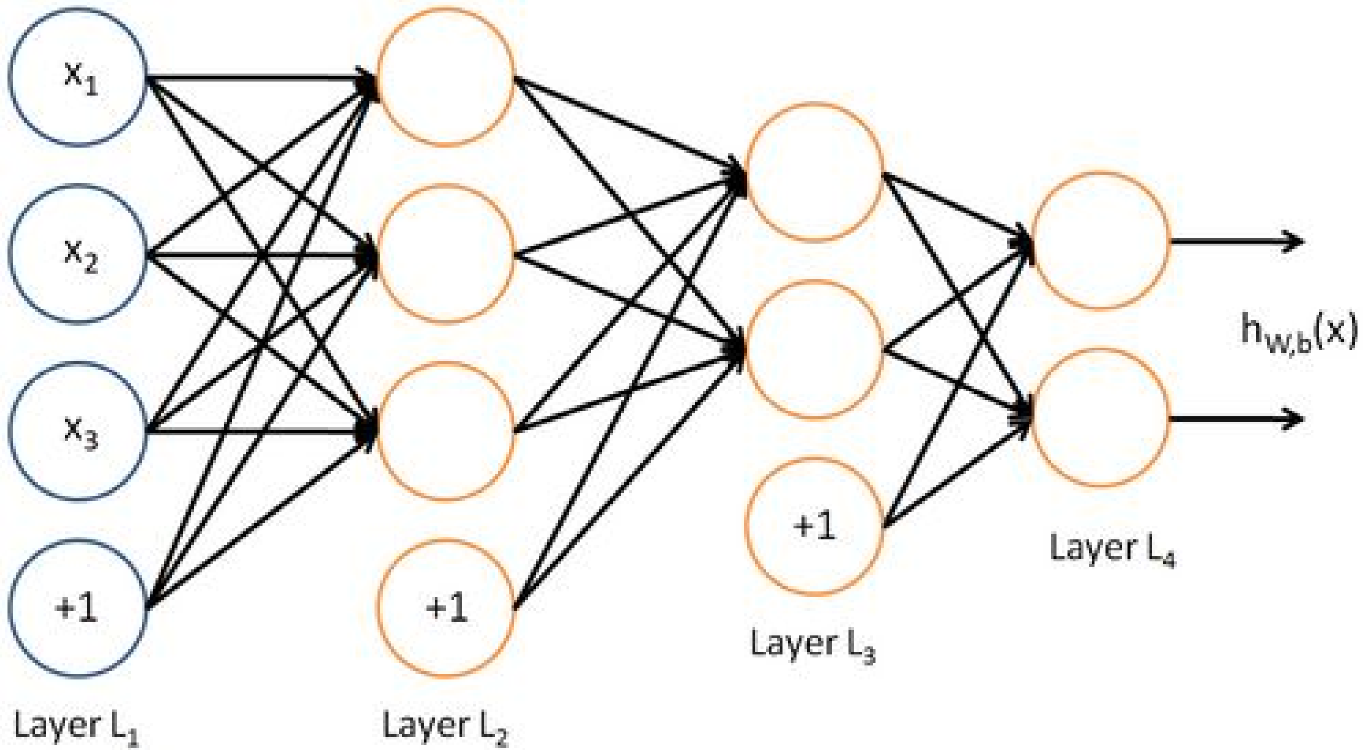


```
charlie@charlie-VirtualBox:~/Documents/ArtificialIntelligence/Hill/project$ sudo
 python twitterAI.py
Accuracy :  0.777317880795
@united I love this plane
love plane
Mood of the incoming tweet is: positive
charlie@charlie-VirtualBox:~/Documents/ArtificialIntelligence/Hill/project$
```



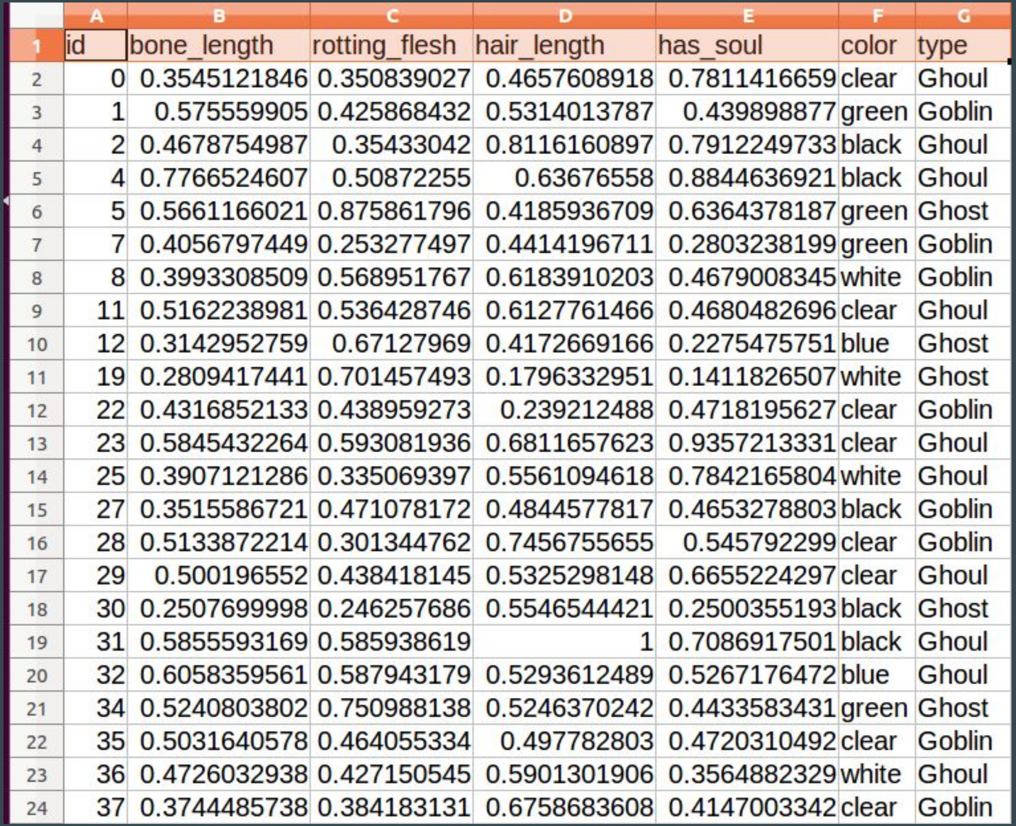
```
charlie@charlie-VirtualBox:~/Documents/ArtificialIntelligence/Hill/project$ sudo
 python twitterAI.py
Accuracy :  0.777317880795
@united I hate this plane. Its so sad. Im going to cry
hate plane sad cri
Mood of the incoming tweet is: negative
charlie@charlie-VirtualBox:~/Documents/ArtificialIntelligence/Hill/project$ 
```

Using a multi output neural network



Working with more simple data

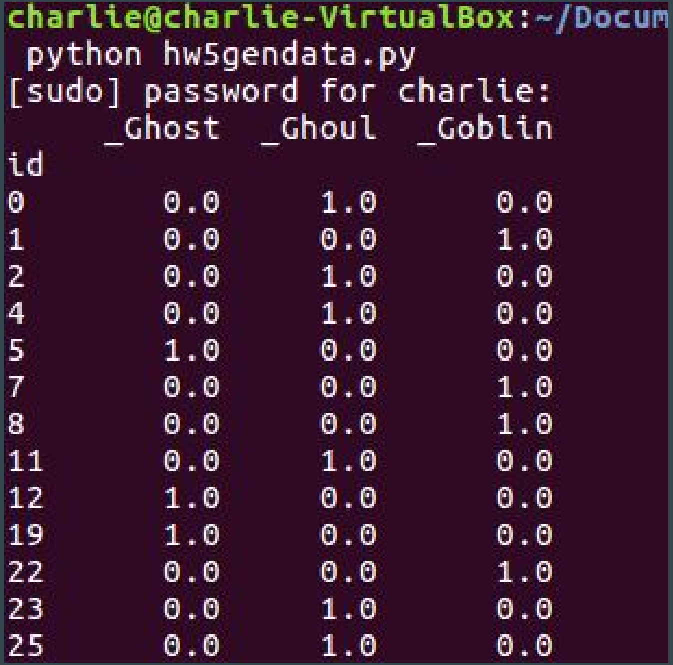
- Kaggle halloween competition



	A	B	C	D	E	F	G
1	id	bone_length	rotting_flesh	hair_length	has_soul	color	type
2	0	0.3545121846	0.350839027	0.4657608918	0.7811416659	clear	Ghoul
3	1	0.575559905	0.425868432	0.5314013787	0.439898877	green	Goblin
4	2	0.4678754987	0.35433042	0.8116160897	0.7912249733	black	Ghoul
5	4	0.7766524607	0.50872255	0.63676558	0.8844636921	black	Ghoul
6	5	0.5661166021	0.875861796	0.4185936709	0.6364378187	green	Ghost
7	7	0.4056797449	0.253277497	0.4414196711	0.2803238199	green	Goblin
8	8	0.3993308509	0.568951767	0.6183910203	0.4679008345	white	Goblin
9	11	0.5162238981	0.536428746	0.6127761466	0.4680482696	clear	Ghoul
10	12	0.3142952759	0.67127969	0.4172669166	0.2275475751	blue	Ghost
11	19	0.2809417441	0.701457493	0.1796332951	0.1411826507	white	Ghost
12	22	0.4316852133	0.438959273	0.239212488	0.4718195627	clear	Goblin
13	23	0.5845432264	0.593081936	0.6811657623	0.9357213331	clear	Ghoul
14	25	0.3907121286	0.335069397	0.5561094618	0.7842165804	white	Ghoul
15	27	0.3515586721	0.471078172	0.4844577817	0.4653278803	black	Goblin
16	28	0.5133872214	0.301344762	0.7456755655	0.545792299	clear	Goblin
17	29	0.500196552	0.438418145	0.5325298148	0.6655224297	clear	Ghoul
18	30	0.2507699998	0.246257686	0.5546544421	0.2500355193	black	Ghost
19	31	0.5855593169	0.585938619	1	0.7086917501	black	Ghoul
20	32	0.6058359561	0.587943179	0.5293612489	0.5267176472	blue	Ghoul
21	34	0.5240803802	0.750988138	0.5246370242	0.4433583431	green	Ghost
22	35	0.5031640578	0.464055334	0.497782803	0.4720310492	clear	Goblin
23	36	0.4726032938	0.427150545	0.5901301906	0.3564882329	white	Ghoul
24	37	0.3744485738	0.384183131	0.6758683608	0.4147003342	clear	Goblin

Massaging the data

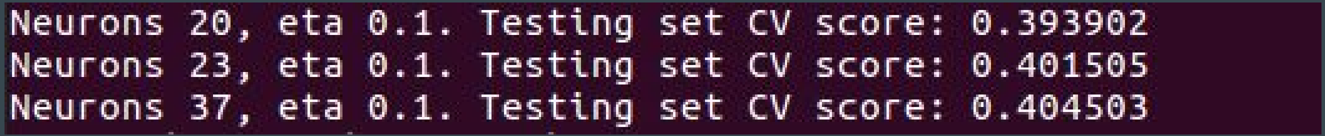
- X becomes Bone_length, rotting_flesh, hair_length and has_soul
- 4 features
- Color of the monster appears to be just noise
- pandas.get_dummies
- Y becomes the type of monster



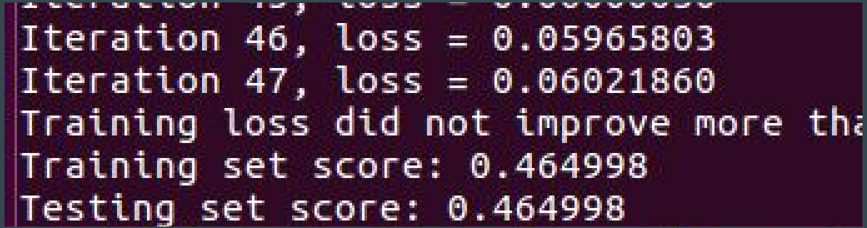
```
charlie@charlie-VirtualBox:~/Docum
 python hw5gendata.py
[sudo] password for charlie:
      _Ghost  _Ghoul  _Goblin
id
0        0.0     1.0      0.0
1        0.0     0.0      1.0
2        0.0     1.0      0.0
4        0.0     1.0      0.0
5        1.0     0.0      0.0
7        0.0     0.0      1.0
8        0.0     0.0      1.0
11       0.0     1.0      0.0
12       1.0     0.0      0.0
19       1.0     0.0      0.0
22       0.0     0.0      1.0
23       0.0     1.0      0.0
25       0.0     1.0      0.0
```

Into the neural network

- Usually around 20 to 40 neurons using MLP
- My best score has been 0.465 but on average its 0.45



```
Neurons 20, eta 0.1. Testing set CV score: 0.393902
Neurons 23, eta 0.1. Testing set CV score: 0.401505
Neurons 37, eta 0.1. Testing set CV score: 0.404503
```



```
Iteration 46, loss = 0.05965803
Iteration 47, loss = 0.06021860
Training loss did not improve more tha
Training set score: 0.464998
Testing set score: 0.464998
```