XCS221 Assignment 1

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Artificial Intelligence: Principles and Techniques

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1.d

=== . . . perhaps the heaviest, most joyless movie ever made about giant dragons taking over the world.

Truth: -1, Prediction: 1 [WRONG].

- More than 50% of the words have a positive weight , which generates a wrong prediction, besides this the word "taking" has a very high positive weight value compared to the other negative values.

=== rock's stand-up magic wanes . hopkins , squarely fills the screen . action - mechanical .

Truth: -1, Prediction: 1 [WRONG].

- Although more than 50% of the words have a negative weight, the prediction is erroneous because the weight values of the negative words are very small.

=== hugh grant's act is so consuming that sometimes it's difficult to tell who the other actors in the movie are .

Truth: -1, Prediction: 1 [WRONG]

- The number of words with positive weight doubles the number of words with negative weight, this generates an erroneous prediction.

=== by its modest , straight-ahead standards , undisputed scores a direct hit .

Truth: 1, Prediction: -1 [WRONG].

- besides the fact that the majority of the words have a negative weight, their negative values are very large, especially the words "by" and "straight-ahead". This generates the incorrect prediction.

=== if this is cinema , i pledge allegiance to cagney and lacey .

Truth: -1, Prediction: 1 [WRONG]

- In this case we have words with positive weight of large sizes such as "cinema" and "if", this generates the wrong prediction.

1.f

The lowest error is obtained with n=5. The error begins to remain at the same value from iteration 6, tests were performed with smaller and lower values of n=5 to show that larger errors were presented, it should be noted that the average word size is 5 characters, which can be associated with the error reuction at n=5.

In order to report the results, we got:

n=4

```
(XCS221) C:\Users\Admin\Desktop\XCS221\XCS221-A1-master\src> python grader.py 1b-2-basic
========== START GRADING
----- START 1b-2-basic:  Test classifier on real polarity dev dataset.
Read 3554 examples from polarity.train
Read 3554 examples from polarity.dev
Iteration:0, Training error:0.09088351153629713, Test error:0.27940348902644907
Iteration:1, Training error:0.027855936972425437, Test error:0.28137310073157007
Iteration:2, Training error:0.009003939223410242, Test error:0.27940348902644907
Iteration:3, Training error:0.005627462014631401, Test error:0.27771525042205963
Iteration:4, Training error:0.0028137310073157004, Test error:0.27884074282498594
Iteration:5, Training error:0.0019696117051209903, Test error:0.27884074282498594
Iteration:6, Training error:0.0008441193021947102, Test error:0.28165447383230163
Iteration:7, Training error:0.0005627462014631402, Test error:0.27884074282498594
Iteration:8, Training error:0.0002813731007315701, Test error:0.2810917276308385
Iteration:9, Training error:0.0, Test error:0.28165447383230163
Iteration:10, Training error:0.0, Test error:0.28081035453010694
Iteration:11, Training error:0.0, Test error:0.2799662352279122
Iteration:12, Training error:0.0, Test error:0.27884074282498594
Iteration:13, Training error:0.0, Test error:0.28165447383230163
Iteration:14, Training error:0.0, Test error:0.28165447383230163
Iteration:15, Training error:0.0, Test error:0.27968486212718063
Iteration:16, Training error:0.0, Test error:0.2824985931344963
Iteration:17, Training error:0.0, Test error:0.2830613393359595
Iteration:18, Training error:0.0, Test error:0.28165447383230163
Iteration:19, Training error:0.0, Test error:0.28418683173888576
46545 weights
Official: train error = 0.0, dev error = 0.28418683173888576
----- END 1b-2-basic [took 0:00:12.727654 (max allowed 8 seconds), 2/2 points]
```

n=5

```
(XCS221) C:\Users\Admin\Desktop\XCS221\XCS221-A1-master\src> python grader.py 1b-2-basic
========== START GRADING
----- START 1b-2-basic:  Test classifier on real polarity dev dataset.
Read 3554 examples from polarity.train
Read 3554 examples from polarity.dev
Iteration:0, Training error:0.0498030388294879, Test error:0.27884074282498594
Iteration:1, Training error:0.010973550928531233, Test error:0.27968486212718063
Iteration:2, Training error:0.0022509848058525606, Test error:0.2734946539110861
Iteration:3, Training error:0.0022509848058525606, Test error:0.27124366910523356
Iteration:4, Training error:0.0008441193021947102, Test error:0.26927405740011257
Iteration:5, Training error:0.0008441193021947102, Test error:0.2723691615081598
Iteration:6, Training error:0.0002813731007315701, Test error:0.27743387732132807
Iteration:7, Training error:0.0, Test error:0.2743387732132808
Iteration:8, Training error:0.0, Test error:0.27687113111986494
Iteration:9, Training error:0.0, Test error:0.2751828925154755
Iteration:10, Training error:0.0, Test error:0.2743387732132808
Iteration:11, Training error:0.0, Test error:0.27546426561620707
Iteration:12, Training error:0.0, Test error:0.2732132808103545
Iteration:13, Training error:0.0, Test error:0.2726505346088914
Iteration:14, Training error:0.0, Test error:0.2732132808103545
Iteration:15, Training error:0.0, Test error:0.2734946539110861
Iteration:16, Training error:0.0, Test error:0.2737760270118177
Iteration:17, Training error:0.0, Test error:0.2734946539110861
Iteration:18, Training error:0.0, Test error:0.2737760270118177
Iteration:19, Training error:0.0, Test error:0.2737760270118177
107217 weights
Official: train error = 0.0, dev error = 0.2737760270118177
----- END 1b-2-basic [took 0:00:13.956340 (max allowed 8 seconds), 2/2 points]
```

N=6

```
(XCS221) C:\Users\Admin\Desktop\XCS221\XCS221-A1-master\src> python grader.py 1b-2-basic
========== START GRADING
----- START 1b-2-basic:  Test classifier on real polarity dev dataset.
Read 3554 examples from polarity.train
Read 3554 examples from polarity.dev
Iteration:0, Training error:0.029262802476083285, Test error:0.2923466516601013
Iteration:1, Training error:0.005064715813168261, Test error:0.2785593697242544
Iteration:2, Training error:0.0014068655036578502, Test error:0.2751828925154755
Iteration:3, Training error:0.0011254924029262803, Test error:0.2771525042205965
Iteration:4, Training error:0.0002813731007315701, Test error:0.27293190770962295
Iteration:5, Training error:0.0002813731007315701, Test error:0.2732132808103545
Iteration:6, Training error:0.0, Test error:0.2718064153066967
Iteration:7, Training error:0.0, Test error:0.2723691615081598
Iteration:8, Training error:0.0, Test error:0.2751828925154755
Iteration:9, Training error:0.0, Test error:0.2751828925154755
Iteration:10, Training error:0.0, Test error:0.2734946539110861
Iteration:11, Training error:0.0, Test error:0.2732132808103545
Iteration:12, Training error:0.0, Test error:0.2726505346088914
Iteration:13, Training error:0.0, Test error:0.2732132808103545
Iteration:14, Training error:0.0, Test error:0.27405740011254925
Iteration:15, Training error:0.0, Test error:0.27490151941474394
Iteration:16, Training error:0.0, Test error:0.2746201463140124
Iteration:17, Training error:0.0, Test error:0.2737760270118177
Iteration:18, Training error:0.0, Test error:0.2737760270118177
Iteration:19, Training error:0.0, Test error:0.2726505346088914
166487 weights
Official: train error = 0.0, dev error = 0.2726505346088914
----- END 1b-2-basic [took 0:00:14.103421 (max allowed 8 seconds), 2/2 points]
```