

# winequality-white.csv

```
the_10_rates = [0.0001, 0.0002, 0.0003, 0.0005, 0.0007, 0.0009, 0.0014, 0.0004,  
0.003, 0.0023]  
num_iters = 2000
```

Run#: 1

The seed for random thetas initializing: 5

Thetas initial vector: [0.22199317 0.87073231 0.20671916 0.91861091 0.48841119  
0.61174386

0.76590786 0.51841799 0.2968005 0.18772123 0.08074127]

COST: 12.422363661994694

Thetas [[ 1.24728315 0.6583174 0.15846882 0.68343755 0.27707844 0.41253532  
0.54842385 0.23345366 -0.00971589 0.27380173 0.0455177 ]]

Last 10 costs [12.44723652 12.44446992 12.44170405 12.43893892 12.43617453  
12.43341088

12.43064797 12.4278858 12.42512436 12.42236366]

Run#: 2

The seed for random thetas initializing: 3

Thetas initial vector: [0.5507979 0.70814782 0.29090474 0.51082761 0.89294695  
0.89629309

0.12558531 0.20724288 0.0514672 0.44080984 0.02987621]

COST: 7.130896617774537

Thetas [[ 2.30718261 0.46617876 0.13754609 0.28113005 0.59672545 0.52354046  
0.01090447 -0.06200023 -0.37438782 0.4838308 0.01427394 ]]

Last 10 costs [7.1565821 7.15372306 7.1508653 7.14800881 7.14515359 7.14229965  
7.13944699 7.13659559 7.13374547 7.13089662]

Run#: 3

The seed for random thetas initializing: 2

Thetas initial vector: [0.4359949 0.02592623 0.54966248 0.43532239 0.4203678  
0.33033482

0.20464863 0.61927097 0.29965467 0.26682728 0.62113383]

COST: 4.994176041741395

Thetas [[ 2.89159221 -0.03937246 0.23373481 0.23265958 0.13052154 0.03927797  
-0.01376376 0.1498847 -0.16360434 0.2026878 0.3245759 ]]

Last 10 costs [5.02002269 5.01714358 5.01426629 5.01139081 5.00851715 5.0056453  
5.00277527 4.99990705 4.99704064 4.99417604]

Run#: 4

The seed for random thetas initializing: 1

Thetas initial vector: [4.17022005e-01 7.20324493e-01 1.14374817e-04 3.02332573e-  
01

1.46755891e-01 9.23385948e-02 1.86260211e-01 3.45560727e-01

3.96767474e-01 5.38816734e-01 4.19194514e-01]

COST: 2.428863682233865

Thetas [[ 3.86946351 0.29513263 -0.07496098 0.05316178 -0.00603834 -0.08742403  
0.0479932 -0.04832577 -0.11449074 0.35784628 0.13283839 ]]

Last 10 costs [2.4478026 2.44568984 2.44357919 2.44147066 2.43936424 2.43725992  
2.43515771 2.4330576 2.43095959 2.42886368]

Run#: 5

The seed for random thetas initializing: 7

Thetas initial vector: [0.07630829 0.77991879 0.43840923 0.72346518 0.97798951  
0.53849587

0.50112046 0.07205113 0.26843898 0.4998825 0.67923 ]

COST: 1.3877842341895896  
Thetas [[ 4.44795332 0.27602353 0.04904899 0.14943703 0.46825353 0.0468647  
0.21935881 -0.33878587 -0.53630176 0.37723312 0.19760549]]  
Last 10 costs [1.40141538 1.39989234 1.39837143 1.39685264 1.39533596 1.3938214  
1.39230895 1.39079861 1.38929037 1.38778423]

=====  
Run#: 6  
The seed for random thetas initializing: 1  
Thetas initial vector: [4.17022005e-01 7.20324493e-01 1.14374817e-04 3.02332573e-  
01  
1.46755891e-01 9.23385948e-02 1.86260211e-01 3.45560727e-01  
3.96767474e-01 5.38816734e-01 4.19194514e-01]  
COST: 0.7512009720784621  
Thetas [[ 4.97596206 0.17040375 -0.10409846 0.02054485 0.06519858 -0.10123336  
0.07624359 -0.08982276 -0.21295549 0.24326475 0.07240189]]  
Last 10 costs [0.75820671 0.75742278 0.75664023 0.75585906 0.75507928 0.75430087  
0.75352384 0.75274818 0.75197389 0.75120097]

=====  
Run#: 7  
The seed for random thetas initializing: 2  
Thetas initial vector: [0.4359949 0.02592623 0.54966248 0.43532239 0.4203678  
0.33033482  
0.20464863 0.61927097 0.29965467 0.26682728 0.62113383]  
COST: 0.36366211349616023  
Thetas [[ 5.54763477 -0.00997776 -0.10135497 0.06563527 0.20986165 -0.09793354  
0.04378245 -0.04196566 -0.37323524 0.08441289 0.08487873]]  
Last 10 costs [0.36516498 0.36499619 0.36482784 0.36465995 0.36449252 0.36432554  
0.36415901 0.36399293 0.3638273 0.36366211]

=====  
Run#: 8  
The seed for random thetas initializing: 8  
Thetas initial vector: [0.8734294 0.96854066 0.86919454 0.53085569 0.23272833  
0.0113988  
0.43046882 0.40235136 0.52267467 0.4783918 0.55535647]  
COST: 3.131654857628139  
Thetas [[ 3.62961141 0.44098958 0.35733934 0.19330275 -0.04511012 -0.15830029  
0.19402215 -0.11227048 -0.06580703 0.41672978 0.22866541]]  
Last 10 costs [3.15187559 3.14962147 3.14736919 3.14511875 3.14287017 3.14062342  
3.13837852 3.13613546 3.13389424 3.13165486]

=====  
Run#: 9  
The seed for random thetas initializing: 4  
Thetas initial vector: [0.96702984 0.54723225 0.97268436 0.71481599 0.69772882  
0.2160895  
0.97627445 0.00623026 0.25298236 0.43479153 0.77938292]  
COST: 0.2968198608117139  
Thetas [[ 5.86584578 0.09051963 -0.1202197 0.02425364 0.40545894 -0.05141807  
0.17454981 -0.17371298 -0.5487192 0.14178931 0.08819649]]  
Last 10 costs [0.29692128 0.29690994 0.29689862 0.29688731 0.29687603 0.29686476  
0.29685351 0.29684228 0.29683106 0.29681986]

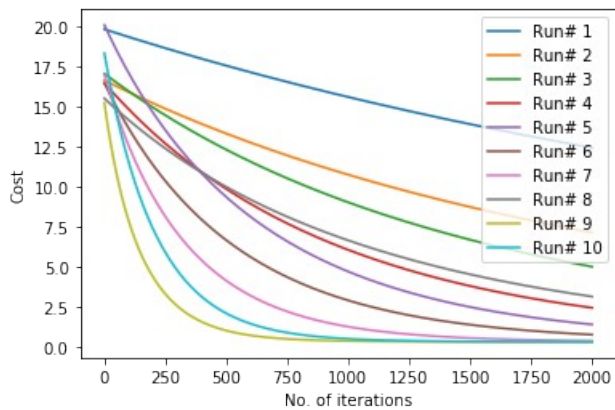
=====  
Run#: 10  
The seed for random thetas initializing: 9  
Thetas initial vector: [0.01037415 0.50187459 0.49577329 0.13382953 0.14211109  
0.21855868  
0.41850818 0.24810117 0.08405965 0.34549864 0.16677635]  
COST: 0.30294424372736034

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Thetas [[ 5.81924151  0.06013274 -0.1275185   0.02023324  0.28526546 -0.0770686
          0.1322463  -0.12396405 -0.43633067  0.1185177   0.0695632  ]]
Last 10 costs [0.30308979 0.30307344 0.30305713 0.30304087 0.30302466 0.30300849
0.30299236 0.30297628 0.30296024 0.30294424]

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the_10_rates = [0.0001, 0.0002, 0.0003, 0.0005, 0.0007, 0.0009, 0.0014, 0.0004,
0.003, 0.0023]
num_iters = 7000

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Run#: 1
The seed for random thetas initializing: 1
Thetas initial vector: [4.17022005e-01 7.20324493e-01 1.14374817e-04 3.02332573e-01
1.46755891e-01 9.23385948e-02 1.86260211e-01 3.45560727e-01
3.96767474e-01 5.38816734e-01 4.19194514e-01]
COST: 4.155244890153106
Thetas [[ 3.16620787  0.37202753 -0.05877074  0.08496594 -0.02141381 -0.06913663
          0.04451628 -0.00584966 -0.04691608  0.41475216  0.18099508]]
Last 10 costs [4.16215522 4.16138678 4.16061849 4.15985037 4.1590824  4.15831458
4.15754693 4.15677942 4.15601208 4.15524489]

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Run#: 2
The seed for random thetas initializing: 2
Thetas initial vector: [0.4359949  0.02592623 0.54966248 0.43532239 0.4203678  0.33033482
0.20464863 0.61927097 0.29965467 0.26682728 0.62113383]
COST: 1.248077141834418
Thetas [[ 4.53613766 -0.03172267  0.0279978  0.13519735  0.13097702 -0.06785127
          -0.00819377  0.00852457 -0.29789755  0.1271902  0.16367595]]
Last 10 costs [1.25145804 1.25108178 1.25070567 1.25032972 1.24995391 1.24957826
1.24920275 1.2488274  1.2484522  1.24807714]

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Run#: 3
The seed for random thetas initializing: 7
Thetas initial vector: [0.07630829 0.77991879 0.43840923 0.72346518 0.97798951 0.53849587
0.50112046 0.07205113 0.26843898 0.4998825  0.67923  ]
COST: 0.5742065793081507
Thetas [[ 5.16768981  0.21701196 -0.02680571  0.08541982  0.47583702  0.00655158
          0.21722495 -0.28941608 -0.58521723  0.30057336  0.1366641  ]]
Last 10 costs [0.57566735 0.57550466 0.57534207 0.57517957 0.57501717 0.57485486
0.57469237 0.57452987 0.57436737 0.57420658]

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0.57469265 0.57453053 0.57436851 0.57420658]
=====
Run#: 4
The seed for random thetas initializing: 10
Thetas initial vector: [0.77132064 0.02075195 0.63364823 0.74880388 0.49850701 0.22479665
0.19806286 0.76053071 0.16911084 0.08833981 0.68535982]
COST: 0.31411852735195966
Thetas [[ 5.72383865 -0.01217712 -0.12361613 0.06782667 0.29173032 -0.09837142
0.02984879 -0.01066474 -0.46767532 0.0735134 0.08087131]]
Last 10 costs [0.31425218 0.31423727 0.31422238 0.31420751 0.31419265 0.3141778
0.31416296 0.31414814 0.31413332 0.31411853]
=====
Run#: 5
The seed for random thetas initializing: 0
Thetas initial vector: [0.5488135 0.71518937 0.60276338 0.54488318 0.4236548 0.64589411
0.43758721 0.891773 0.96366276 0.38344152 0.79172504]
COST: 0.3096718441398096
Thetas [[ 5.83829383 0.01761364 -0.13094166 0.02539598 0.19099248 -0.09965435
0.1062739 -0.10557981 -0.33518591 0.08739793 0.06451366]]
Last 10 costs [0.30971111 0.30970674 0.30970237 0.309698 0.30969364 0.30968927
0.30968491 0.30968055 0.3096762 0.30967184]
=====
Run#: 6
The seed for random thetas initializing: 2
Thetas initial vector: [0.4359949 0.02592623 0.54966248 0.43532239 0.4203678 0.33033482
0.20464863 0.61927097 0.29965467 0.26682728 0.62113383]
COST: 0.29640929831727614
Thetas [[ 5.86794464 0.03366864 -0.14928454 0.02573352 0.33778012 -0.0755171
0.07680944 -0.06058658 -0.50083224 0.09528438 0.07550366]]
Last 10 costs [0.29642649 0.29642458 0.29642267 0.29642076 0.29641885 0.29641694
0.29641503 0.29641312 0.29641121 0.2964093 ]
=====
Run#: 7
The seed for random thetas initializing: 10
Thetas initial vector: [0.77132064 0.02075195 0.63364823 0.74880388 0.49850701 0.22479665
0.19806286 0.76053071 0.16911084 0.08833981 0.68535982]
COST: 0.2898015210128629
Thetas [[ 5.87762812 0.07174722 -0.15810245 0.01924729 0.4510705 -0.05025595
0.06971855 -0.04315426 -0.62763157 0.12286446 0.08281901]]
Last 10 costs [0.28981185 0.2898107 0.28980955 0.2898084 0.28980726 0.28980611
0.28980496 0.28980381 0.28980267 0.28980152]
=====
Run#: 8
The seed for random thetas initializing: 1
Thetas initial vector: [4.17022005e-01 7.20324493e-01 1.14374817e-04 3.02332573e-01
1.46755891e-01 9.23385948e-02 1.86260211e-01 3.45560727e-01
3.96767474e-01 5.38816734e-01 4.19194514e-01]
COST: 0.37374737325871504
Thetas [[ 5.54601841 0.09415103 -0.1233509 0.01405978 0.14173912 -0.0996945
0.09794741 -0.10200317 -0.28814454 0.16394707 0.05589649]]
Last 10 costs [0.37419722 0.37414708 0.37409699 0.37404693 0.37399691 0.37394693
0.37389698 0.37384708 0.37379721 0.37374737]
=====
Run#: 9
The seed for random thetas initializing: 6
Thetas initial vector: [0.89286015 0.33197981 0.82122912 0.04169663 0.10765668 0.59505206
0.52981736 0.41880743 0.33540785 0.62251943 0.43814143]
COST: 0.28635104977148457
Thetas [[ 5.87790935 0.10869958 -0.16352501 0.01484306 0.55358214 -0.027099
0.06556933 -0.03044516 -0.74188389 0.15119864 0.08927919]]
Last 10 costs [0.28635629 0.2863557 0.28635512 0.28635454 0.28635396 0.28635337
0.28635279 0.28635221 0.28635163 0.28635105]
=====
Run#: 10
The seed for random thetas initializing: 5
Thetas initial vector: [0.22199317 0.87073231 0.20671916 0.91861091 0.48841119 0.61174386

```

```
0.76590786 0.51841799 0.2968005 0.18772123 0.08074127]
COST: 0.28653566571035666
Thetas [[ 5.87790879 0.10660497 -0.16261088 0.01508135 0.5459292 -0.02860793
0.06769832 -0.03359734 -0.73285298 0.1496083 0.08894475]]
Last 10 costs [0.28654036 0.28653984 0.28653931 0.28653879 0.28653827 0.28653775
0.28653723 0.28653671 0.28653619 0.28653567]
=====
```