Basic NeuralNet - Iris Data

```r
library(nnet)
library(neuralnet)

head(iris)
```

```
##   Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 1          5.1         3.5          1.4         0.2  setosa
## 2          4.9         3.0          1.4         0.2  setosa
## 3          4.7         3.2          1.3         0.2  setosa
## 4          4.6         3.1          1.5         0.2  setosa
## 5          5.0         3.6          1.4         0.2  setosa
## 6          5.4         3.9          1.7         0.4  setosa
```

```r
str(iris)
```

```
## 'data.frame':    150 obs. of  5 variables:
##  $ Sepal.Length: num  5.1 4.9 4.7 4.6 5 5.4 4.6 5 4.4 4.9 ...
##  $ Sepal.Width : num  3.5 3 3.2 3.1 3.6 3.9 3.4 3.4 2.9 3.1 ...
##  $ Petal.Length: num  1.4 1.4 1.3 1.5 1.4 1.7 1.4 1.5 1.4 1.5 ...
##  $ Petal.Width : num  0.2 0.2 0.2 0.2 0.2 0.4 0.3 0.2 0.2 0.1 ...
##  $ Species     : Factor w/ 3 levels "setosa","versicolor",..: 1 1 1 1 1 1 1 1 1 1 ...
```

```r
# Start off with a Basic dataset - the good ol - IRIS

trainData <- cbind(iris[, 1:4], class.ind(iris$Species))

# Column Bind the 1 to 4 Columns Range
# Create a INDEX using the iris$Species Variable
#
```

```r
# Create a SAMPLE Creation helper

samp<-c(sample(1:50,25), sample(51:100,25), sample(101:150,25))

## Code Source -- https://rweb.stat.umn.edu/R/library/nnet/html/predict.nnet.html
```

```r
#Building ANN
library(neuralnet)

## First ANN
set.seed(123)

nn_iris<-neuralnet(setosa + versicolor + virginica ~ Sepal.Length + Sepal.Width + Petal.Length
+ Petal.Width,
trainData[samp,], hidden = c(5,5), threshold = 0.01,
stepmax = 1e+05, algorithm = "rprop+",
err.fct = "sse", act.fct = "logistic")

#Plotting the Model
#
plot(nn_iris)
nn_iris
```

```
## $call
## neuralnet(formula = setosa + versicolor + virginica ~ Sepal.Length +
##     Sepal.Width + Petal.Length + Petal.Width, data = trainData[samp,
##     ], hidden = c(5, 5), threshold = 0.01, stepmax = 100000,
##     algorithm = "rprop+", err.fct = "sse", act.fct = "logistic")
##
## $response
##     setosa versicolor virginica
## 3        1          0         0
## 43       1          0         0
## 7        1          0         0
## 13       1          0         0
## 47       1          0         0
## 6        1          0         0
## 26       1          0         0
## 49       1          0         0
## 16       1          0         0
## 4        1          0         0
## 35       1          0         0
## 15       1          0         0
## 14       1          0         0
## 11       1          0         0
## 41       1          0         0
## 23       1          0         0
## 46       1          0         0
## 2        1          0         0
## 12       1          0         0
## 19       1          0         0
## 50       1          0         0
## 22       1          0         0
## 17       1          0         0
## 37       1          0         0
## 24       1          0         0
## 79       0          1         0
## 74       0          1         0
## 52       0          1         0
## 99       0          1         0
## 75       0          1         0
## 97       0          1         0
## 95       0          1         0
## 87       0          1         0
## 83       0          1         0
## 81       0          1         0
## 90       0          1         0
## 77       0          1         0
## 89       0          1         0
## 93       0          1         0
## 57       0          1         0
## 69       0          1         0
## 96       0          1         0
## 68       0          1         0
## 91       0          1         0
## 59       0          1         0
## 56       0          1         0
```

```
## 100      0           1           0
## 78       0           1           0
## 72       0           1           0
## 61       0           1           0
## 105      0           0           1
## 111      0           0           1
## 134      0           0           1
## 149      0           0           1
## 132      0           0           1
## 107      0           0           1
## 126      0           0           1
## 123      0           0           1
## 137      0           0           1
## 127      0           0           1
## 119      0           0           1
## 124      0           0           1
## 146      0           0           1
## 121      0           0           1
## 139      0           0           1
## 128      0           0           1
## 140      0           0           1
## 138      0           0           1
## 113      0           0           1
## 112      0           0           1
## 135      0           0           1
## 145      0           0           1
## 142      0           0           1
## 115      0           0           1
## 125      0           0           1
##
## $covariate
##        [,1] [,2] [,3] [,4]
##  [1,]  4.7  3.2  1.3  0.2
##  [2,]  4.4  3.2  1.3  0.2
##  [3,]  4.6  3.4  1.4  0.3
##  [4,]  4.8  3.0  1.4  0.1
##  [5,]  5.1  3.8  1.6  0.2
##  [6,]  5.4  3.9  1.7  0.4
##  [7,]  5.0  3.0  1.6  0.2
##  [8,]  5.3  3.7  1.5  0.2
##  [9,]  5.7  4.4  1.5  0.4
## [10,]  4.6  3.1  1.5  0.2
## [11,]  4.9  3.1  1.5  0.2
## [12,]  5.8  4.0  1.2  0.2
## [13,]  4.3  3.0  1.1  0.1
## [14,]  5.4  3.7  1.5  0.2
## [15,]  5.0  3.5  1.3  0.3
## [16,]  4.6  3.6  1.0  0.2
## [17,]  4.8  3.0  1.4  0.3
## [18,]  4.9  3.0  1.4  0.2
## [19,]  4.8  3.4  1.6  0.2
## [20,]  5.7  3.8  1.7  0.3
## [21,]  5.0  3.3  1.4  0.2
## [22,]  5.1  3.7  1.5  0.4
```

```
## [23,]  5.4  3.9  1.3  0.4
## [24,]  5.5  3.5  1.3  0.2
## [25,]  5.1  3.3  1.7  0.5
## [26,]  6.0  2.9  4.5  1.5
## [27,]  6.1  2.8  4.7  1.2
## [28,]  6.4  3.2  4.5  1.5
## [29,]  5.1  2.5  3.0  1.1
## [30,]  6.4  2.9  4.3  1.3
## [31,]  5.7  2.9  4.2  1.3
## [32,]  5.6  2.7  4.2  1.3
## [33,]  6.7  3.1  4.7  1.5
## [34,]  5.8  2.7  3.9  1.2
## [35,]  5.5  2.4  3.8  1.1
## [36,]  5.5  2.5  4.0  1.3
## [37,]  6.8  2.8  4.8  1.4
## [38,]  5.6  3.0  4.1  1.3
## [39,]  5.8  2.6  4.0  1.2
## [40,]  6.3  3.3  4.7  1.6
## [41,]  6.2  2.2  4.5  1.5
## [42,]  5.7  3.0  4.2  1.2
## [43,]  5.8  2.7  4.1  1.0
## [44,]  5.5  2.6  4.4  1.2
## [45,]  6.6  2.9  4.6  1.3
## [46,]  5.7  2.8  4.5  1.3
## [47,]  5.7  2.8  4.1  1.3
## [48,]  6.7  3.0  5.0  1.7
## [49,]  6.1  2.8  4.0  1.3
## [50,]  5.0  2.0  3.5  1.0
## [51,]  6.5  3.0  5.8  2.2
## [52,]  6.5  3.2  5.1  2.0
## [53,]  6.3  2.8  5.1  1.5
## [54,]  6.2  3.4  5.4  2.3
## [55,]  7.9  3.8  6.4  2.0
## [56,]  4.9  2.5  4.5  1.7
## [57,]  7.2  3.2  6.0  1.8
## [58,]  7.7  2.8  6.7  2.0
## [59,]  6.3  3.4  5.6  2.4
## [60,]  6.2  2.8  4.8  1.8
## [61,]  7.7  2.6  6.9  2.3
## [62,]  6.3  2.7  4.9  1.8
## [63,]  6.7  3.0  5.2  2.3
## [64,]  6.9  3.2  5.7  2.3
## [65,]  6.0  3.0  4.8  1.8
## [66,]  6.1  3.0  4.9  1.8
## [67,]  6.9  3.1  5.4  2.1
## [68,]  6.4  3.1  5.5  1.8
## [69,]  6.8  3.0  5.5  2.1
## [70,]  6.4  2.7  5.3  1.9
## [71,]  6.1  2.6  5.6  1.4
## [72,]  6.7  3.3  5.7  2.5
## [73,]  6.9  3.1  5.1  2.3
## [74,]  5.8  2.8  5.1  2.4
## [75,]  6.7  3.3  5.7  2.1
##
```

```
## $model.list
## $model.list$response
## [1] "setosa"     "versicolor" "virginica"
##
## $model.list$variables
## [1] "Sepal.Length" "Sepal.Width"  "Petal.Length" "Petal.Width"
##
##
## $err.fct
## function (x, y)
## {
##     1/2 * (y - x)^2
## }
## <environment: 0x345a300>
## attr(,"type")
## [1] "sse"
##
## $act.fct
## function (x)
## {
##     1/(1 + exp(-x))
## }
## <environment: 0x345a300>
## attr(,"type")
## [1] "logistic"
##
## $linear.output
## [1] TRUE
##
## $data
##    Sepal.Length Sepal.Width Petal.Length Petal.Width setosa versicolor
## 3           4.7         3.2          1.3         0.2      1          0
## 43          4.4         3.2          1.3         0.2      1          0
## 7           4.6         3.4          1.4         0.3      1          0
## 13          4.8         3.0          1.4         0.1      1          0
## 47          5.1         3.8          1.6         0.2      1          0
## 6           5.4         3.9          1.7         0.4      1          0
## 26          5.0         3.0          1.6         0.2      1          0
## 49          5.3         3.7          1.5         0.2      1          0
## 16          5.7         4.4          1.5         0.4      1          0
## 4           4.6         3.1          1.5         0.2      1          0
## 35          4.9         3.1          1.5         0.2      1          0
## 15          5.8         4.0          1.2         0.2      1          0
## 14          4.3         3.0          1.1         0.1      1          0
## 11          5.4         3.7          1.5         0.2      1          0
## 41          5.0         3.5          1.3         0.3      1          0
## 23          4.6         3.6          1.0         0.2      1          0
## 46          4.8         3.0          1.4         0.3      1          0
## 2           4.9         3.0          1.4         0.2      1          0
## 12          4.8         3.4          1.6         0.2      1          0
## 19          5.7         3.8          1.7         0.3      1          0
## 50          5.0         3.3          1.4         0.2      1          0
## 22          5.1         3.7          1.5         0.4      1          0
## 17          5.4         3.9          1.3         0.4      1          0
```

```
## 37           5.5          3.5          1.3          0.2          1          0
## 24           5.1          3.3          1.7          0.5          1          0
## 79           6.0          2.9          4.5          1.5          0          1
## 74           6.1          2.8          4.7          1.2          0          1
## 52           6.4          3.2          4.5          1.5          0          1
## 99           5.1          2.5          3.0          1.1          0          1
## 75           6.4          2.9          4.3          1.3          0          1
## 97           5.7          2.9          4.2          1.3          0          1
## 95           5.6          2.7          4.2          1.3          0          1
## 87           6.7          3.1          4.7          1.5          0          1
## 83           5.8          2.7          3.9          1.2          0          1
## 81           5.5          2.4          3.8          1.1          0          1
## 90           5.5          2.5          4.0          1.3          0          1
## 77           6.8          2.8          4.8          1.4          0          1
## 89           5.6          3.0          4.1          1.3          0          1
## 93           5.8          2.6          4.0          1.2          0          1
## 57           6.3          3.3          4.7          1.6          0          1
## 69           6.2          2.2          4.5          1.5          0          1
## 96           5.7          3.0          4.2          1.2          0          1
## 68           5.8          2.7          4.1          1.0          0          1
## 91           5.5          2.6          4.4          1.2          0          1
## 59           6.6          2.9          4.6          1.3          0          1
## 56           5.7          2.8          4.5          1.3          0          1
## 100          5.7          2.8          4.1          1.3          0          1
## 78           6.7          3.0          5.0          1.7          0          1
## 72           6.1          2.8          4.0          1.3          0          1
## 61           5.0          2.0          3.5          1.0          0          1
## 105          6.5          3.0          5.8          2.2          0          0
## 111          6.5          3.2          5.1          2.0          0          0
## 134          6.3          2.8          5.1          1.5          0          0
## 149          6.2          3.4          5.4          2.3          0          0
## 132          7.9          3.8          6.4          2.0          0          0
## 107          4.9          2.5          4.5          1.7          0          0
## 126          7.2          3.2          6.0          1.8          0          0
## 123          7.7          2.8          6.7          2.0          0          0
## 137          6.3          3.4          5.6          2.4          0          0
## 127          6.2          2.8          4.8          1.8          0          0
## 119          7.7          2.6          6.9          2.3          0          0
## 124          6.3          2.7          4.9          1.8          0          0
## 146          6.7          3.0          5.2          2.3          0          0
## 121          6.9          3.2          5.7          2.3          0          0
## 139          6.0          3.0          4.8          1.8          0          0
## 128          6.1          3.0          4.9          1.8          0          0
## 140          6.9          3.1          5.4          2.1          0          0
## 138          6.4          3.1          5.5          1.8          0          0
## 113          6.8          3.0          5.5          2.1          0          0
## 112          6.4          2.7          5.3          1.9          0          0
## 135          6.1          2.6          5.6          1.4          0          0
## 145          6.7          3.3          5.7          2.5          0          0
## 142          6.9          3.1          5.1          2.3          0          0
## 115          5.8          2.8          5.1          2.4          0          0
## 125          6.7          3.3          5.7          2.1          0          0
##      virginica
## 3            0
```

```
## 43          0
## 7           0
## 13          0
## 47          0
## 6           0
## 26          0
## 49          0
## 16          0
## 4           0
## 35          0
## 15          0
## 14          0
## 11          0
## 41          0
## 23          0
## 46          0
## 2           0
## 12          0
## 19          0
## 50          0
## 22          0
## 17          0
## 37          0
## 24          0
## 79          0
## 74          0
## 52          0
## 99          0
## 75          0
## 97          0
## 95          0
## 87          0
## 83          0
## 81          0
## 90          0
## 77          0
## 89          0
## 93          0
## 57          0
## 69          0
## 96          0
## 68          0
## 91          0
## 59          0
## 56          0
## 100         0
## 78          0
## 72          0
## 61          0
## 105         1
## 111         1
## 134         1
## 149         1
## 132         1
```

```
## 107          1
## 126          1
## 123          1
## 137          1
## 127          1
## 119          1
## 124          1
## 146          1
## 121          1
## 139          1
## 128          1
## 140          1
## 138          1
## 113          1
## 112          1
## 135          1
## 145          1
## 142          1
## 115          1
## 125          1
##
## $net.result
## $net.result[[1]]
##                  [,1]                [,2]               [,3]
## 3     1.0143474395441 -0.006048611148247  0.00389283162945
## 43    1.0086348307121 -0.003039040101547  0.00664775388777
## 7     1.0010989665247 -0.000896765872784  0.00559631257409
## 13    1.0029486105599  0.002864029891769  0.00275562067381
## 47    1.0011368358438 -0.005597698878851  0.00294675645117
## 6     0.9856482902884  0.003801965964721 -0.00077076855192
## 26    0.9750312532941  0.023076787379160 -0.00166391735526
## 49    1.0132162619548 -0.010116344929427 -0.00018196006849
## 16    0.9539617578698  0.019113617103490 -0.00899750687679
## 4     0.9923274342610  0.010743267527857  0.00288202965660
## 35    0.9972695452026  0.007102049094707  0.00109972208479
## 15    1.0113261400632 -0.007572592126486 -0.01054382942176
## 14    1.0190142062331 -0.007706168469352  0.00653921268644
## 11    1.0154019571744 -0.010865654998491 -0.00129772676131
## 41    1.0124981369090 -0.008163322177342  0.00123938505976
## 23    1.0127057411297 -0.011573137048089  0.00364570409798
## 46    0.9810187823636  0.021518023172434 -0.00287899229125
## 2     0.9940640684479  0.010298872238892 -0.00027758582710
## 12    1.0056380007458 -0.003461474965489  0.00570494564375
## 19    1.0061504118909 -0.005345688397611 -0.00347940798918
## 50    1.0171139751722 -0.008593565518705  0.00226264812371
## 22    0.9935795745550  0.000713374787109  0.00112868942201
## 17    0.9933696264591  0.000188350902848 -0.00478832395525
## 37    1.0288406406768 -0.016061624667596 -0.00311801973998
## 24    0.9673749844562  0.029004116652519 -0.00512976723791
## 79   -0.0033318808047  1.026714025157190 -0.00565593113450
## 74   -0.0125302975899  1.016665534410152 -0.00295091505455
## 52    0.0091643458527  0.989071536206345 -0.00060509505071
## 99    0.0366099561725  0.932744991857511 -0.00538169489396
## 75   -0.0008465258591  0.986179964131173 -0.00029198974474
```

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```
## 97    0.0048295326936   0.997610682227224   0.00040207939620
## 95   -0.0033231865660   1.018655459430740  -0.00263085994678
## 87   -0.0039412645592   1.006381114714407   0.00013985836629
## 83    0.0037846103313   0.984952320249566  -0.00006646970517
## 81   -0.0045331818569   1.007781827537313  -0.00001520824394
## 90   -0.0042457573022   1.026962745187331  -0.00724002926741
## 77   -0.0133089048567   1.026413849287412  -0.00692335249759
## 89    0.0161075672917   0.979757880950839  -0.00113428325412
## 93   -0.0033368897163   1.003427762234932   0.00049123506144
## 57    0.0086159795275   1.006316491135955  -0.00003494382091
## 69   -0.0069945338764   0.996198000305101   0.00832743912556
## 96    0.0125151067036   0.970363121825294  -0.00178401408271
## 68   -0.0015908725818   0.973824660135872  -0.00080830411036
## 91   -0.0099458387019   1.009657098626372   0.00849797579433
## 59   -0.0090591052085   1.001816831893674   0.00017680618333
## 56   -0.0071437227316   1.021644952608187  -0.00381963108168
## 100   0.0028299465414   1.001905612069853   0.00053521575233
## 78   -0.0099371850313   0.988011389798432   0.03414397240471
## 72    0.0046743611034   0.984261051736240  -0.00033235169674
## 61   -0.0058605966517   1.028016246922745  -0.01010741150922
## 105  -0.0036819869912  -0.002428499349987   0.99642263531908
## 111   0.0047474908478   0.004434136262920   1.00685981316740
## 134  -0.0087886986819   0.030133871350272   0.97479994711501
## 149   0.0149121655965   0.002538820342619   0.99730726367068
## 132  -0.0098471310011   0.001487426173662   1.01197920416631
## 107   0.0009703539309  -0.004656008224491   0.99545331936153
## 126  -0.0133183999150  -0.015647340698222   1.01455987803838
## 123  -0.0031689569385   0.000008417112048   0.98971744488120
## 137   0.0126407155675   0.006194824957042   0.99030715220263
## 127  -0.0008894000442   0.013624144241638   0.99127573284374
## 119   0.0097577219474  -0.005865948104863   1.00572732595675
## 124  -0.0027014038439   0.002163004965522   0.99731950253831
## 146   0.0039834382299  -0.001026246744643   1.00121452516868
## 121  -0.0007645721497  -0.001715090212340   0.99993632214491
## 139   0.0039689638468   0.003887881738332   1.00696127856642
## 128   0.0016030218439  -0.008782005331992   1.01788620914625
## 140  -0.0021844012849  -0.006656626963797   1.00874605697378
## 138  -0.0073185108529  -0.015082541988327   1.01516192295735
## 113  -0.0036557331757  -0.004573349636527   1.00168304565072
## 112  -0.0040824654265  -0.003665076737298   0.99581301163747
## 135  -0.0120968612324  -0.007457384138283   0.99184126908098
## 145   0.0070862370149   0.003188167283885   0.99529527990778
## 142   0.0059769636941   0.014234237732481   0.99152165673954
## 115   0.0091540799844   0.000934992908007   0.99623844138904
## 125  -0.0025348033250  -0.006811908750060   1.00659380038977
##
##
## $weights
## $weights[[1]]
## $weights[[1]][[1]]
##                [,1]          [,2]         [,3]          [,4]          [,5]
## [1,] -1.4875239249 -3.263106233  1.2366521525  2.1111506653 -0.1685667893
## [2,] -0.5793384911  0.461576067  0.0786325831  0.4283611564  0.6507297915
## [3,]  0.9009771497  2.170412514  0.8488335815 -2.4484251021 -0.4540343637
```

```
## [4,]   0.3088888346 -1.294257792 -0.2835863283   0.8204316719 -0.4581867052
## [5,]   0.6699270801 -1.970971403 -1.2709400370  -0.2931672283 -0.4216944506
##
## $weights[[1]][[2]]
##                 [,1]          [,2]           [,3]           [,4]
## [1,]   0.05136148824  1.0708647657   -0.1844102524   2.2070398266
## [2,]   1.80708435854  1.2529358789   14.1447061622   0.8954656794
## [3,]  -3.62489319675 62.0584195909 -290.0582712722  -2.7858034248
## [4,]   1.17190095489 -1.1122441725   11.6078608661   1.0277703338
## [5,]   1.27626770100  1.3172947051   21.7157266223   0.1931022610
## [6,]   1.26128012178  0.4554424231  -56.7592066092   1.0094036768
##                 [,5]
## [1,] -0.066132966741
## [2,] -0.138708782908
## [3,] -1.399553957139
## [4,] -0.115692661112
## [5,] -0.223016010653
## [6,] -0.004185998282
##
## $weights[[1]][[3]]
##                 [,1]          [,2]           [,3]
## [1,]   1.483673725366 -0.2703499594  0.005716760751
## [2,]  -1.725230034525  0.8788946759  0.505616304201
## [3,]   0.083604483261 -0.7059252411  1.723302464710
## [4,]   0.007043790657 -1.0818770449  1.072131758699
## [5,]  -0.176004554662  0.5360907179 -2.370490396590
## [6,]   0.646318342787  1.6227098810  0.291546106579
##
##
##
## $startweights
## $startweights[[1]]
## $startweights[[1]][[1]]
##                 [,1]          [,2]          [,3]          [,4]
## [1,]  -0.56047564655  1.7150649869  1.2240817974  1.7869131368
## [2,]  -0.23017748948  0.4609162060  0.3598138271  0.4978504782
## [3,]   1.55870831415 -1.2650612346  0.4007714506 -1.9666171566
## [4,]   0.07050839142 -0.6868528519  0.1106827159  0.7013559016
## [5,]   0.12928773516 -0.4456619701 -0.5558411348 -0.4727914077
##                 [,5]
## [1,] -1.0678237060
## [2,] -0.2179749147
## [3,] -1.0260044483
## [4,] -0.7288912293
## [5,] -0.6250392678
##
## $startweights[[1]][[2]]
##                 [,1]          [,2]           [,3]          [,4]
## [1,]  -1.6866933107 -0.2950714830 -0.06191171058  2.1689559653
## [2,]   0.8377870445  0.8951256610 -0.30596266374  1.2079619983
## [3,]   0.1533731178  0.8781334875 -0.38047100101 -1.1231085832
## [4,]  -1.1381369370  0.8215810816 -0.69470697892 -0.4028848353
## [5,]   1.2538149211  0.6886402541 -0.20791727802 -0.4666553536
## [6,]   0.4264642215  0.5539176535 -1.26539635157  0.7799651183
```

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```
##                  [,5]
## [1,] -0.08336906647
## [2,]  0.25331851399
## [3,] -0.02854675535
## [4,] -0.04287045729
## [5,]  1.36860228401
## [6,] -0.22577098566
##
## $startweights[[1]][[3]]
##                 [,1]          [,2]          [,3]
## [1,]  1.5164706044 -0.5023234531  0.05300422673
## [2,] -1.5487528042 -0.3332073837  0.92226746788
## [3,]  0.5846137496 -1.0185753831  2.05008468563
## [4,]  0.1238542438 -1.0717912265 -0.49103116606
## [5,]  0.2159415687  0.3035286414 -2.30916887564
## [6,]  0.3796394828  0.4482097786  1.00573852446
##
##
##
## $generalized.weights
## $generalized.weights[[1]]
##                 [,1]            [,2]            [,3]            [,4]
## 3    -1.17053689140  -2.424728279917   3.7013588432   5.99640772499
## 43   -2.42124413690  -3.583230154418   6.4727903343  11.40872050357
## 7   -22.53422424971   2.901567587127  41.2203407066  86.91720242559
## 13   -2.47146149831 -40.310509098965  27.6127434432  31.24272632613
## 47  -20.96010199025  51.757624102737  17.7699134645  63.49455043653
## 6     1.92044961771  -4.370412282795  -1.6059973666  -5.46396884468
## 26    0.45480921056   7.243826649401  -4.5697760519  -4.96705181469
## 49   -1.64680758113   3.481151953459   1.7161973070   5.01383112280
## 16    0.70093199398  -2.343149033618  -0.1958889981  -1.62376401075
## 4     2.53825420456  13.184974549147 -11.2152373347 -15.60994804853
## 35    5.02739809771  38.421992344025 -29.9866503060 -37.67000560718
## 15   -2.46030407176   6.842073823678   1.2006647187   5.32439837460
## 14   -0.69896360016  -3.178024221989   3.1794399297   4.68592878176
## 11   -1.38473158427   2.854626244093   1.4837644181   4.17397051292
## 41   -1.76348769400   2.239169153078   2.4738935252   5.93070041300
## 23   -1.81243249591   4.966343295210   1.3010913487   5.32648368388
## 46    1.00909499649   7.754329564067  -5.5758714467  -6.92261050221
## 2     1.81624143244  22.364039862232 -15.3489280059 -17.54206153805
## 12   -3.66536964201  -2.212153956674   8.5431291630  16.03001922123
## 19   -3.86117888819   7.297095034777   4.1554432033  11.11312855311
## 50   -0.91065508546  -1.316985302657   2.7115865474   4.44340030011
## 22    4.14764050176  -7.272140839456  -4.4612492567 -12.73592665722
## 17    4.29953067981 -11.682332702130  -2.5127648449 -10.61267381773
## 37   -0.55935842335   0.596498549848   0.9651207083   1.93093176003
## 24    0.99535765363   3.043727113379  -3.0243180311  -4.51327016878
## 79    1.21241209077  -9.613345729919   6.6936406624  -3.15638103318
## 74    0.14407380830  -1.373086871413   1.2694424602  -0.54463674009
## 52   -0.43779818685   7.571873271807  -4.4594379953  -0.45033948365
## 99    0.07992232678   4.019212509684  -2.2664962370  -1.44348899956
## 75    3.22920248605 -58.988327572777  37.2102024890   2.99743645364
## 97   -0.83174967490  11.660223976442  -7.1076587857   0.04192899024
## 95    1.02795391096  -9.382720786403   6.6983379841  -2.39914932186
```

```
## 87     1.00753935385   -9.848485191166    6.4685587374   -1.60399583567
## 83    -0.78692710740   14.878966063524   -9.1191640586   -1.16535867514
## 81     0.64535460258   -5.330294827107    4.0385750916   -1.37513352792
## 90     0.64327281514   -5.041992081786    4.2181020804   -2.27074167571
## 77     0.09532581128   -0.531340314436    0.8459509514   -0.73103775500
## 89    -0.16479833422    5.183954670850   -3.0370036813   -0.80245534834
## 93     0.94977704441   -9.619519995854    6.6979862526   -1.44368633242
## 57    -0.66915293295    7.043270190795   -4.0805105181    0.53450979824
## 69     0.70904610812    2.061250714493   -0.4261214698   -2.94625019163
## 96    -0.12862306821    6.872169131292   -4.0326727347   -1.43323412884
## 68     0.88703371722  -33.667454518982   21.1130253976    6.21554713237
## 91     0.32948670866   -1.377499484149    1.3167561690   -1.11937517794
## 59     0.28049542842   -2.994565859108    2.2330095278   -0.54038449993
## 56     0.42914880216   -3.799745938700    2.8418098749   -1.18589117482
## 100   -1.42288683102   17.232970826736  -10.8062606004    0.99205675009
## 78     0.69435304310   -1.073037041441    0.8425462400   -1.94688373441
## 72    -0.64918353053   12.619102248565   -7.6874848669   -0.96797651461
## 61     0.35775944800   -1.177519746169    1.7005474941   -1.67633594126
## 105    0.48084068003    0.450139353934    2.0771644250   -5.79683983939
## 111   -1.52862826946    6.359237095867   -3.8660630031    4.24067529510
## 134    0.49216969610   -0.082696260270    0.5913342868   -1.81483882301
## 149   -0.66125825210    2.892379794766   -1.5036794708    1.89228001370
## 132    0.76048069289   -2.323081053167    1.2952393556   -1.90723269575
## 107   -1.61794931024    9.990033109906  -14.5981960919   19.16252181659
## 126    0.01015073569   -0.002412252481    0.6678695820   -0.97455091557
## 123   -1.02383770645   10.438969753354   -0.7999673894   -5.57003811220
## 137   -0.78781738263    3.056274317850   -1.5796562655    2.38274751406
## 127    4.65513026443  -11.533716875146   12.6857454571  -19.81315432568
## 119    0.47715892981   -3.995889906184    0.3531894898    1.51523378880
## 124    0.55431056948   -0.018203131189    3.2634856480   -6.06317144769
## 146   -0.96574805893    2.792724243389   -3.2254519878    5.45437969494
## 121    5.38918316227  -14.860265172184   15.6416941440  -28.95639345624
## 139   -1.65589306597    7.036218312708   -4.5046777929    4.66167268905
## 128   -3.09001110151   15.712145203338  -11.1949959405   10.43482516720
## 140    1.33452958992   -4.803988533087    5.8149992027   -8.39827438577
## 138    0.30335093128   -1.855065048430    1.9202159628   -2.07301942992
## 113    0.43672643593   -0.343473307249    2.5833363825   -5.12763901192
## 112   -0.14004213267    2.639959488394    1.4088003705   -4.28198564662
## 135   -0.22972162047    1.375431657075    0.3148813377   -1.00340437382
## 145   -1.06977163539    3.480646899141   -2.1667520553    3.84916437760
## 142   -1.02301303794    3.179385697784   -2.4259167379    3.72129768993
## 115   -0.50187671950    1.301013132641   -1.3735362857    2.74910943748
## 125    1.91385361755   -8.323644755646    6.1395750384   -8.04114839890
##                 [,5]             [,6]            [,7]             [,8]
## 3      1.46335595937    6.51397192879   -5.89466530864  -10.8274445823
## 43     3.67904463431   13.86735678200  -12.90473387016  -24.6814923015
## 7     13.01110733863   23.20225723351  -34.56136706046  -76.0493297011
## 13    -2.48189615668  -30.55344519019   19.02930338735   27.2191675959
## 47     1.38764354083   -3.91092370424   -1.68538671978   -7.4702704696
## 6     -2.61954817226    5.75411248256    3.13068817775   12.1370825173
## 26    -0.55620441043   -5.70758949757    3.43161159064    4.6845671450
## 49     0.73717175299   -1.63123400638   -1.08115790918   -3.8863281663
## 16    -0.53659962754    2.62948158461    0.03123442518    1.9019300791
## 4     -1.30406349306   -8.25139754336    5.74881591535    9.1807660914
```

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## 35    -1.48764250982   -11.80423478893     7.93973614280     12.0131498243
## 15     1.33212886706    -5.00625369105    -0.51343112183     -4.1018208562
## 14     1.04166955689     7.30260228496    -5.41308928350     -9.2537814406
## 11     0.67848254106    -1.48161644652    -1.00290525424     -3.5055610697
## 41     1.07075434903    -0.23100840460    -2.24545293312     -5.9415205576
## 23     0.62401089437    -2.14136636517    -0.62743443050     -3.3519977532
## 46    -0.76776627458    -5.53597150995     3.57354325741      5.2547550074
## 2     -0.99471200810    -9.71134475976     6.09974362905      8.6696940360
## 12     2.83029613573     7.74335131998    -9.17215915945    -18.8498192249
## 19     1.65678045647    -2.94185129521    -2.39535241452     -7.6496585800
## 50     0.86101439585     3.24200267447    -3.41825041620     -6.4876401998
## 22   -14.55152627890    14.70543068861    23.66533084083     72.1465876639
## 17   -53.18206937350   177.40680022717    35.90772758354    204.9357055691
## 37     0.36779433538    -0.17888326893    -0.89018717700     -2.1981228591
## 24    -0.76996942342    -3.35899212198     2.54054699242      4.1380817040
## 79     0.45241893937     2.35253664455    -1.25943387965     -2.6868034840
## 74     1.02921356959     4.89065289031    -2.81874677858     -5.1100731839
## 52    -2.71111514172   -12.24826339689     7.38317043088     12.4145950742
## 99    -0.76465774378    -3.82698949569     2.27540898192      3.5259514417
## 75    -2.08000001547    -9.65514798680     5.74872521530      9.6631114015
## 97   -10.60812461186   -46.90637781909    28.30218760982     48.8476450046
## 95     0.98213164627     4.30432991480    -2.55303556005     -4.6833777862
## 87     3.45863806849    15.23300926617    -9.10873831427    -16.1583079232
## 83    -1.93100301940    -9.02845628435     5.37722262441      8.9931701391
## 81     2.51376382909    12.21611824308    -7.09825589547    -12.3327530213
## 90     0.56000954244     2.74414569062    -1.55186776794     -2.9131871168
## 77     0.59508379422     2.98543901596    -1.69225358520     -3.0121775970
## 89    -1.63622903794    -7.52180544038     4.53793179588      7.4632308720
## 93     6.27554827888    29.43735223657   -17.32464002608    -30.0864476532
## 57     3.79553977700    16.31612507772    -9.91432223367    -17.3262213401
## 69   217.98230631146   -28.80544759032  -220.79300604018   -192.1818187662
## 96    -1.22470155959    -5.68354942349     3.41835413629      5.5839281053
## 68    -1.23139890348    -5.87891976940     3.48093837917      5.7463172007
## 91   -27.20365759740   -36.01946099789    43.88819888135     44.9227317057
## 59    12.09697122702    56.63128023619   -33.27126999823    -57.8088306616
## 56    -0.20806834925     1.56317548150    -0.20150969543     -1.7828728143
## 100   12.31509644519    54.65851713971   -32.83754574166    -57.2651158748
## 78    59.38907216648    66.42403017818   -91.87960433247    -87.5690371585
## 72    -1.89922504286    -8.84043085586     5.27656665993      8.8001161339
## 61     0.54739950478     2.97714899808    -1.66202552120     -2.8648046351
## 105    0.32174123623    -2.71980633321     1.86682992657     -1.2844025171
## 111   54.39090149290    61.07722231606   -88.60202402566    -61.7010923136
## 134   22.90062980178    13.51459807118   -30.41009222074    -27.8195626300
## 149   -5.64022332527    -4.25692472771     5.35502609993     17.0081795551
## 132  244.10271664074   319.46697152361  -406.17979044669   -341.2477029285
## 107    1.75483598700     3.48218444165    -2.33070907757     -6.6190429950
## 126    0.22126598074     2.64873620951    -1.02942682909     -2.5764085374
## 123 1034.88426136374 -1004.05140172383  -643.12688920237  -1483.1293007563
## 137   -1.73641752026     1.55782922269     0.31845134767      4.1339734570
## 127   24.80661633175    13.00017902944   -33.31998190653    -24.8648080944
## 119   -1.60321436897    -0.02383918745     1.49208676076      3.1027123606
## 124   67.87767660823    -1.13955782051   -76.44559441670    -48.4607073562
## 146    0.82961610926     5.08748992591     1.37579728976    -17.9917030149
## 121    3.01273628320     0.63685886196    -1.06810683900    -10.7902130976
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## 139   77.10877199782    91.68982259299 -126.24843287636   -96.8941701888
## 128  -16.12659075147   -14.80323063498   24.99291757370    16.3955122613
## 140   -1.86054234517     2.72817529764    1.78234698338    -2.9671945356
## 138    0.75024409525     2.46833128959   -1.45410386640    -3.3284678460
## 113    0.69149799974     3.33845501043   -1.28370932858    -4.8356281515
## 112    0.09543224705     4.97146126997   -1.43487717643    -4.1227454047
## 135    0.36575967314     5.03793670796   -2.12058493764    -3.5129711084
## 145   -1.81994441014     5.08724686568   -1.53031926017     3.7646754816
## 142   13.37164843616     6.34734492016  -18.38399786389   -10.0608567591
## 115   -1.74692025219    22.68323272654  -10.64050734073    -0.8442976199
## 125    1.58362782664     2.71016560625   -1.99294755578    -5.8481281818
##                  [,9]            [,10]            [,11]            [,12]
## 3        -2.3005790933     2.5598937873     0.59136132112    -4.23609289186
## 43       -1.4209638670     2.1665107568     0.11814504012    -2.92677671826
## 7        -1.8963134097     1.8319515691     0.58669569165    -2.64131486536
## 13       -2.1604682092     5.1390664199    -0.41395392067    -8.54839842216
## 47       -4.4289375288    -0.9030986456     3.61332033087    -1.16960051169
## 6        16.0130595514     1.8123497197   -12.35623321143     4.83357241066
## 26        1.5943419671   -12.8500558370     3.93199595998    19.58405979597
## 49       62.5707275001    21.5259141836   -53.33992417400    21.57106555236
## 16        1.4733179516     0.5516940385    -1.34366815508    -0.20513376733
## 4        -2.1075798076     7.7347861472    -1.65771555642    -9.97741916238
## 35       -5.2464777363    14.8180959829    -2.21007574798   -22.51832215324
## 15        0.8704057535     0.8290923319    -0.91177910997     0.09706813882
## 14       -1.3327444365     2.2044339627     0.07345968800    -3.09631477869
## 11        8.4078456231     3.4976597861    -7.36525781061     2.92148980003
## 41       -8.7133846332     0.6796109471     5.82081846950    -6.06310825844
## 23       -3.6283554159    -0.9041308750     2.99127334311    -0.72379959263
## 46        1.1125610681    -8.8381688278     2.86186797435    11.47874466282
## 2        16.2032310073   -62.6830274690    13.44308224015    96.38908228115
## 12       -1.7943140625     1.5294911707     0.66463928891    -2.62562188426
## 19        2.9544076769     1.2206126773    -2.55426982558     1.22703044670
## 50       -4.0270811931     2.1977193371     1.97444884488    -5.61267585014
## 22      -10.4670559233     1.2552646910     6.94803296082    -5.72870908964
## 17        2.4263149206     1.0741368465    -2.14927116743     0.28460267708
## 37        2.8604838153     1.5298024895    -2.58799217131     1.52051957892
## 24        0.8221265460    -5.1600846271     1.61713277688     6.07318495506
## 79       -1.0680184248    -6.9929663911     3.64177436663     6.26562136763
## 74       -2.3722540768   -11.7086164990     7.06245520978    10.22718421188
## 52        3.8387169901    22.1680386190   -11.98527184593   -17.19066401735
## 99        0.8200567257     5.1979222672    -2.96193784607    -3.63060093856
## 75        8.4056048033    38.0117407627   -21.14645005366   -33.76291398022
## 97       -1.2521167103   -10.1711238762     4.23128694573     6.30359117246
## 95       -2.9226563692   -13.1390104436     8.08619677304    12.02099239419
## 87        7.5767116164    32.8406779921   -24.74069843544   -28.85939630038
## 83       37.0670219136   174.3947252016   -97.58167567376  -148.72962988102
## 81     -197.5123091259 -1039.5316726605   640.88494270108   868.24645517896
## 90       -1.5624370204    -7.7149869411     4.52132496952     6.84974725009
## 77       -1.6520156922    -7.8564862759     4.75337485341     6.77858332651
## 89        2.5038149984    15.1588155204    -8.35790289577   -11.17244841873
## 93        2.1967976490    12.5135045362    -8.34564665511   -10.06342736061
## 57      -23.3055353684   -11.1571933668    34.26200787216    56.68890355627
## 69      -97.7777898358    17.8469634825    97.11889843772    84.85322401582
## 96        1.8454074709    10.4337244683    -5.85766984619    -7.85505862178
```

```
## 68      3.8793687856    16.3843803534    -9.57890190199   -14.42286575244
## 91    -31.3334315085   -41.9947456729    50.51616226406    53.64665641504
## 59      1.6334066993    16.5234838974   -12.38431221882    -9.74716085962
## 56      3.0532826662    -1.4070277266    -3.06770960532    -0.50842156129
## 100     0.9532204489     2.2544542219    -2.66752720600    -3.33377179718
## 78    -20.9776319724   -22.9527222393    32.22145554477    30.96942438728
## 72      7.9719178237    38.9273208079   -21.70841044606   -33.00050848818
## 61     -1.4664895494    -7.1163837811     4.23813311298     6.12233849687
## 105     0.9095185917    -1.9427170246     0.37669842745     3.38713419127
## 111    32.9756415529    32.9359227743   -52.30990950640   -35.67732199255
## 134   -26.6022808031   -14.3384394418    34.78631268182    31.88041513179
## 149     9.8881415781    12.6986040072   -12.53035395056   -23.68222104746
## 132    29.1353038848    36.2965435740   -47.65353810002   -40.54465878766
## 107     3.5204691670     8.9915376957    -6.18881671931    -8.81827338010
## 126    -0.8690778525    -5.2289326275     2.75372478486     3.93916252958
## 123    -0.9299414624     0.5640397995     0.57237059120     3.77522146421
## 137     2.1008471389    -0.2851357939    -1.34692010143    -3.31473252283
## 127   -37.0016394094   -15.4117337057    48.24027474332    35.67046732823
## 119     2.0998996753     1.0759780336    -2.24008852359    -8.01559485858
## 124   -50.7398509155    14.0422122862    52.25032986380    32.32728798413
## 146    -6.2472678495   -16.6134754581     9.25418937536    16.43853822512
## 121   174.8659234466   192.2228363594  -197.68698204154  -259.44903659090
## 139    40.8794935943    44.6252841619   -65.49883478322   -49.88549627332
## 128     7.2372277406     4.9219327057   -10.60400644389    -6.62992052739
## 140     0.3864020326    -5.4278127499     1.05836028085     3.76273254752
## 138    -1.3852475024    -4.9060475042     3.10061248489     4.63048703514
## 113    -5.7297955663   -20.1571590460    12.06965606749    14.36871180026
## 112     1.3133813916     8.2723687019    -4.19471619376    -2.94392348195
## 135     1.1938009169     8.2311680729    -4.32249590226    -4.16563636329
## 145     2.4655079312    -3.5254093096    -0.09215429084    -1.21006701698
## 142   -20.9944686594    -7.1845135690    27.99284396910    14.96079932607
## 115     1.0701524053    -7.8248454062     2.93598205184     4.68040940882
## 125    -3.0260381333    -7.0265460971     5.17353066068     8.13398486117
##
##
##
## $result.matrix
##                                      1
## error                   0.016606521857
## reached.threshold       0.009807598173
## steps                5370.000000000000
## Intercept.to.1layhid1   -1.487523924940
## Sepal.Length.to.1layhid1  -0.579338491079
## Sepal.Width.to.1layhid1    0.900977149739
## Petal.Length.to.1layhid1   0.308888834641
## Petal.Width.to.1layhid1    0.669927080073
## Intercept.to.1layhid2     -3.263106233472
## Sepal.Length.to.1layhid2   0.461576067033
## Sepal.Width.to.1layhid2    2.170412513525
## Petal.Length.to.1layhid2  -1.294257792298
## Petal.Width.to.1layhid2   -1.970971403100
## Intercept.to.1layhid3      1.236652152520
## Sepal.Length.to.1layhid3   0.078632583098
## Sepal.Width.to.1layhid3    0.848833581520
## Petal.Length.to.1layhid3  -0.283586328276
```

```
## Petal.Width.to.1layhid3    -1.270940036957
## Intercept.to.1layhid4       2.111150665265
## Sepal.Length.to.1layhid4    0.428361156435
## Sepal.Width.to.1layhid4    -2.448425102116
## Petal.Length.to.1layhid4    0.820431671869
## Petal.Width.to.1layhid4    -0.293167228300
## Intercept.to.1layhid5      -0.168566789340
## Sepal.Length.to.1layhid5    0.650729791502
## Sepal.Width.to.1layhid5    -0.454034363698
## Petal.Length.to.1layhid5   -0.458186705239
## Petal.Width.to.1layhid5    -0.421694450581
## Intercept.to.2layhid1       0.051361488240
## 1layhid.1.to.2layhid1       1.807084358539
## 1layhid.2.to.2layhid1      -3.624893196748
## 1layhid.3.to.2layhid1       1.171900954895
## 1layhid.4.to.2layhid1       1.276267701000
## 1layhid.5.to.2layhid1       1.261280121784
## Intercept.to.2layhid2       1.070864765692
## 1layhid.1.to.2layhid2       1.252935878945
## 1layhid.2.to.2layhid2      62.058419590893
## 1layhid.3.to.2layhid2      -1.112244172494
## 1layhid.4.to.2layhid2       1.317294705134
## 1layhid.5.to.2layhid2       0.455442423089
## Intercept.to.2layhid3      -0.184410252424
## 1layhid.1.to.2layhid3      14.144706162224
## 1layhid.2.to.2layhid3    -290.058271272166
## 1layhid.3.to.2layhid3      11.607860866064
## 1layhid.4.to.2layhid3      21.715726622342
## 1layhid.5.to.2layhid3     -56.759206609226
## Intercept.to.2layhid4       2.207039826631
## 1layhid.1.to.2layhid4       0.895465679442
## 1layhid.2.to.2layhid4      -2.785803424820
## 1layhid.3.to.2layhid4       1.027770333810
## 1layhid.4.to.2layhid4       0.193102260957
## 1layhid.5.to.2layhid4       1.009403676791
## Intercept.to.2layhid5      -0.066132966741
## 1layhid.1.to.2layhid5      -0.138708782908
## 1layhid.2.to.2layhid5      -1.399553957139
## 1layhid.3.to.2layhid5      -0.115692661112
## 1layhid.4.to.2layhid5      -0.223016010653
## 1layhid.5.to.2layhid5      -0.004185998282
## Intercept.to.setosa         1.483673725366
## 2layhid.1.to.setosa        -1.725230034525
## 2layhid.2.to.setosa         0.083604483261
## 2layhid.3.to.setosa         0.007043790657
## 2layhid.4.to.setosa        -0.176004554662
## 2layhid.5.to.setosa         0.646318342787
## Intercept.to.versicolor    -0.270349959374
## 2layhid.1.to.versicolor     0.878894675948
## 2layhid.2.to.versicolor    -0.705925241134
## 2layhid.3.to.versicolor    -1.081877044882
## 2layhid.4.to.versicolor     0.536090717946
## 2layhid.5.to.versicolor     1.622709881029
## Intercept.to.virginica      0.005716760751
```

```
## 2layhid.1.to.virginica        0.505616304201
## 2layhid.2.to.virginica        1.723302464710
## 2layhid.3.to.virginica        1.072131758699
## 2layhid.4.to.virginica       -2.370490396590
## 2layhid.5.to.virginica        0.291546106579
##
## attr(,"class")
## [1] "nn"
# STEPS == 11032
# ERROR == 0.010194

set.seed(123)

## ANN - 2


nn_iris_1<-neuralnet(setosa + versicolor + virginica ~ Sepal.Length + Sepal.Width + Petal.Length + Petal
trainData[samp,], hidden = c(5,3), threshold = 0.01, stepmax = 1e+05, algorithm = "rprop+",
err.fct = "sse", act.fct = "logistic",rep=5 , linear.output = FALSE) ## Added -- rep=="5" , hidden == c


#Plotting the Model
#
plot(nn_iris_1,col.out = "red")
nn_iris_1

## $call
## neuralnet(formula = setosa + versicolor + virginica ~ Sepal.Length +
##     Sepal.Width + Petal.Length + Petal.Width, data = trainData[samp,
##     ], hidden = c(5, 3), threshold = 0.01, stepmax = 100000,
##     rep = 5, algorithm = "rprop+", err.fct = "sse", act.fct = "logistic",
##     linear.output = FALSE)
##
## $response
##    setosa versicolor virginica
## 3       1          0         0
## 43      1          0         0
## 7       1          0         0
## 13      1          0         0
## 47      1          0         0
## 6       1          0         0
## 26      1          0         0
## 49      1          0         0
## 16      1          0         0
## 4       1          0         0
## 35      1          0         0
## 15      1          0         0
## 14      1          0         0
## 11      1          0         0
## 41      1          0         0
## 23      1          0         0
## 46      1          0         0
## 2       1          0         0
## 12      1          0         0
```

```
## 19           1               0               0
## 50           1               0               0
## 22           1               0               0
## 17           1               0               0
## 37           1               0               0
## 24           1               0               0
## 79           0               1               0
## 74           0               1               0
## 52           0               1               0
## 99           0               1               0
## 75           0               1               0
## 97           0               1               0
## 95           0               1               0
## 87           0               1               0
## 83           0               1               0
## 81           0               1               0
## 90           0               1               0
## 77           0               1               0
## 89           0               1               0
## 93           0               1               0
## 57           0               1               0
## 69           0               1               0
## 96           0               1               0
## 68           0               1               0
## 91           0               1               0
## 59           0               1               0
## 56           0               1               0
## 100          0               1               0
## 78           0               1               0
## 72           0               1               0
## 61           0               1               0
## 105          0               0               1
## 111          0               0               1
## 134          0               0               1
## 149          0               0               1
## 132          0               0               1
## 107          0               0               1
## 126          0               0               1
## 123          0               0               1
## 137          0               0               1
## 127          0               0               1
## 119          0               0               1
## 124          0               0               1
## 146          0               0               1
## 121          0               0               1
## 139          0               0               1
## 128          0               0               1
## 140          0               0               1
## 138          0               0               1
## 113          0               0               1
## 112          0               0               1
## 135          0               0               1
## 145          0               0               1
## 142          0               0               1
```

```
## 115         0            0            1
## 125         0            0            1
##
## $covariate
##        [,1] [,2] [,3] [,4]
##  [1,]   4.7  3.2  1.3  0.2
##  [2,]   4.4  3.2  1.3  0.2
##  [3,]   4.6  3.4  1.4  0.3
##  [4,]   4.8  3.0  1.4  0.1
##  [5,]   5.1  3.8  1.6  0.2
##  [6,]   5.4  3.9  1.7  0.4
##  [7,]   5.0  3.0  1.6  0.2
##  [8,]   5.3  3.7  1.5  0.2
##  [9,]   5.7  4.4  1.5  0.4
## [10,]   4.6  3.1  1.5  0.2
## [11,]   4.9  3.1  1.5  0.2
## [12,]   5.8  4.0  1.2  0.2
## [13,]   4.3  3.0  1.1  0.1
## [14,]   5.4  3.7  1.5  0.2
## [15,]   5.0  3.5  1.3  0.3
## [16,]   4.6  3.6  1.0  0.2
## [17,]   4.8  3.0  1.4  0.3
## [18,]   4.9  3.0  1.4  0.2
## [19,]   4.8  3.4  1.6  0.2
## [20,]   5.7  3.8  1.7  0.3
## [21,]   5.0  3.3  1.4  0.2
## [22,]   5.1  3.7  1.5  0.4
## [23,]   5.4  3.9  1.3  0.4
## [24,]   5.5  3.5  1.3  0.2
## [25,]   5.1  3.3  1.7  0.5
## [26,]   6.0  2.9  4.5  1.5
## [27,]   6.1  2.8  4.7  1.2
## [28,]   6.4  3.2  4.5  1.5
## [29,]   5.1  2.5  3.0  1.1
## [30,]   6.4  2.9  4.3  1.3
## [31,]   5.7  2.9  4.2  1.3
## [32,]   5.6  2.7  4.2  1.3
## [33,]   6.7  3.1  4.7  1.5
## [34,]   5.8  2.7  3.9  1.2
## [35,]   5.5  2.4  3.8  1.1
## [36,]   5.5  2.5  4.0  1.3
## [37,]   6.8  2.8  4.8  1.4
## [38,]   5.6  3.0  4.1  1.3
## [39,]   5.8  2.6  4.0  1.2
## [40,]   6.3  3.3  4.7  1.6
## [41,]   6.2  2.2  4.5  1.5
## [42,]   5.7  3.0  4.2  1.2
## [43,]   5.8  2.7  4.1  1.0
## [44,]   5.5  2.6  4.4  1.2
## [45,]   6.6  2.9  4.6  1.3
## [46,]   5.7  2.8  4.5  1.3
## [47,]   5.7  2.8  4.1  1.3
## [48,]   6.7  3.0  5.0  1.7
## [49,]   6.1  2.8  4.0  1.3
```

```
## [50,]  5.0  2.0  3.5  1.0
## [51,]  6.5  3.0  5.8  2.2
## [52,]  6.5  3.2  5.1  2.0
## [53,]  6.3  2.8  5.1  1.5
## [54,]  6.2  3.4  5.4  2.3
## [55,]  7.9  3.8  6.4  2.0
## [56,]  4.9  2.5  4.5  1.7
## [57,]  7.2  3.2  6.0  1.8
## [58,]  7.7  2.8  6.7  2.0
## [59,]  6.3  3.4  5.6  2.4
## [60,]  6.2  2.8  4.8  1.8
## [61,]  7.7  2.6  6.9  2.3
## [62,]  6.3  2.7  4.9  1.8
## [63,]  6.7  3.0  5.2  2.3
## [64,]  6.9  3.2  5.7  2.3
## [65,]  6.0  3.0  4.8  1.8
## [66,]  6.1  3.0  4.9  1.8
## [67,]  6.9  3.1  5.4  2.1
## [68,]  6.4  3.1  5.5  1.8
## [69,]  6.8  3.0  5.5  2.1
## [70,]  6.4  2.7  5.3  1.9
## [71,]  6.1  2.6  5.6  1.4
## [72,]  6.7  3.3  5.7  2.5
## [73,]  6.9  3.1  5.1  2.3
## [74,]  5.8  2.8  5.1  2.4
## [75,]  6.7  3.3  5.7  2.1
##
## $model.list
## $model.list$response
## [1] "setosa"     "versicolor" "virginica"
##
## $model.list$variables
## [1] "Sepal.Length" "Sepal.Width"  "Petal.Length" "Petal.Width"
##
##
## $err.fct
## function (x, y)
## {
##     1/2 * (y - x)^2
## }
## <bytecode: 0x2964878>
## <environment: 0x424f558>
## attr(,"type")
## [1] "sse"
##
## $act.fct
## function (x)
## {
##     1/(1 + exp(-x))
## }
## <bytecode: 0x392d3f8>
## <environment: 0x424f558>
## attr(,"type")
## [1] "logistic"
```

```
## 
## $linear.output
## [1] FALSE
## 
## $data
##     Sepal.Length Sepal.Width Petal.Length Petal.Width setosa versicolor
## 3            4.7         3.2          1.3         0.2      1          0
## 43           4.4         3.2          1.3         0.2      1          0
## 7            4.6         3.4          1.4         0.3      1          0
## 13           4.8         3.0          1.4         0.1      1          0
## 47           5.1         3.8          1.6         0.2      1          0
## 6            5.4         3.9          1.7         0.4      1          0
## 26           5.0         3.0          1.6         0.2      1          0
## 49           5.3         3.7          1.5         0.2      1          0
## 16           5.7         4.4          1.5         0.4      1          0
## 4            4.6         3.1          1.5         0.2      1          0
## 35           4.9         3.1          1.5         0.2      1          0
## 15           5.8         4.0          1.2         0.2      1          0
## 14           4.3         3.0          1.1         0.1      1          0
## 11           5.4         3.7          1.5         0.2      1          0
## 41           5.0         3.5          1.3         0.3      1          0
## 23           4.6         3.6          1.0         0.2      1          0
## 46           4.8         3.0          1.4         0.3      1          0
## 2            4.9         3.0          1.4         0.2      1          0
## 12           4.8         3.4          1.6         0.2      1          0
## 19           5.7         3.8          1.7         0.3      1          0
## 50           5.0         3.3          1.4         0.2      1          0
## 22           5.1         3.7          1.5         0.4      1          0
## 17           5.4         3.9          1.3         0.4      1          0
## 37           5.5         3.5          1.3         0.2      1          0
## 24           5.1         3.3          1.7         0.5      1          0
## 79           6.0         2.9          4.5         1.5      0          1
## 74           6.1         2.8          4.7         1.2      0          1
## 52           6.4         3.2          4.5         1.5      0          1
## 99           5.1         2.5          3.0         1.1      0          1
## 75           6.4         2.9          4.3         1.3      0          1
## 97           5.7         2.9          4.2         1.3      0          1
## 95           5.6         2.7          4.2         1.3      0          1
## 87           6.7         3.1          4.7         1.5      0          1
## 83           5.8         2.7          3.9         1.2      0          1
## 81           5.5         2.4          3.8         1.1      0          1
## 90           5.5         2.5          4.0         1.3      0          1
## 77           6.8         2.8          4.8         1.4      0          1
## 89           5.6         3.0          4.1         1.3      0          1
## 93           5.8         2.6          4.0         1.2      0          1
## 57           6.3         3.3          4.7         1.6      0          1
## 69           6.2         2.2          4.5         1.5      0          1
## 96           5.7         3.0          4.2         1.2      0          1
## 68           5.8         2.7          4.1         1.0      0          1
## 91           5.5         2.6          4.4         1.2      0          1
## 59           6.6         2.9          4.6         1.3      0          1
## 56           5.7         2.8          4.5         1.3      0          1
## 100          5.7         2.8          4.1         1.3      0          1
## 78           6.7         3.0          5.0         1.7      0          1
```

```
## 72            6.1        2.8        4.0        1.3        0        1
## 61            5.0        2.0        3.5        1.0        0        1
## 105           6.5        3.0        5.8        2.2        0        0
## 111           6.5        3.2        5.1        2.0        0        0
## 134           6.3        2.8        5.1        1.5        0        0
## 149           6.2        3.4        5.4        2.3        0        0
## 132           7.9        3.8        6.4        2.0        0        0
## 107           4.9        2.5        4.5        1.7        0        0
## 126           7.2        3.2        6.0        1.8        0        0
## 123           7.7        2.8        6.7        2.0        0        0
## 137           6.3        3.4        5.6        2.4        0        0
## 127           6.2        2.8        4.8        1.8        0        0
## 119           7.7        2.6        6.9        2.3        0        0
## 124           6.3        2.7        4.9        1.8        0        0
## 146           6.7        3.0        5.2        2.3        0        0
## 121           6.9        3.2        5.7        2.3        0        0
## 139           6.0        3.0        4.8        1.8        0        0
## 128           6.1        3.0        4.9        1.8        0        0
## 140           6.9        3.1        5.4        2.1        0        0
## 138           6.4        3.1        5.5        1.8        0        0
## 113           6.8        3.0        5.5        2.1        0        0
## 112           6.4        2.7        5.3        1.9        0        0
## 135           6.1        2.6        5.6        1.4        0        0
## 145           6.7        3.3        5.7        2.5        0        0
## 142           6.9        3.1        5.1        2.3        0        0
## 115           5.8        2.8        5.1        2.4        0        0
## 125           6.7        3.3        5.7        2.1        0        0
##      virginica
## 3            0
## 43           0
## 7            0
## 13           0
## 47           0
## 6            0
## 26           0
## 49           0
## 16           0
## 4            0
## 35           0
## 15           0
## 14           0
## 11           0
## 41           0
## 23           0
## 46           0
## 2            0
## 12           0
## 19           0
## 50           0
## 22           0
## 17           0
## 37           0
## 24           0
## 79           0
```

```
## 74          0
## 52          0
## 99          0
## 75          0
## 97          0
## 95          0
## 87          0
## 83          0
## 81          0
## 90          0
## 77          0
## 89          0
## 93          0
## 57          0
## 69          0
## 96          0
## 68          0
## 91          0
## 59          0
## 56          0
## 100         0
## 78          0
## 72          0
## 61          0
## 105         1
## 111         1
## 134         1
## 149         1
## 132         1
## 107         1
## 126         1
## 123         1
## 137         1
## 127         1
## 119         1
## 124         1
## 146         1
## 121         1
## 139         1
## 128         1
## 140         1
## 138         1
## 113         1
## 112         1
## 135         1
## 145         1
## 142         1
## 115         1
## 125         1
##
## $net.result
## $net.result[[1]]
##                                                                                    [,1]
## 3    1.0000000000000000000000000000000000000000000000000000000000000000000000000000000
```

```
## 43   1.0000000000000000000000000000000000000000000000000000000000000000000
## 7    1.0000000000000000000000000000000000000000000000000000000000000000000
## 13   1.0000000000000000000000000000000000000000000000000000000000000000000
## 47   1.0000000000000000000000000000000000000000000000000000000000000000000
## 6    1.0000000000000000000000000000000000000000000000000000000000000000000
## 26   1.0000000000000000000000000000000000000000000000000000000000000000000
## 49   1.0000000000000000000000000000000000000000000000000000000000000000000
## 16   1.0000000000000000000000000000000000000000000000000000000000000000000
## 4    1.0000000000000000000000000000000000000000000000000000000000000000000
## 35   1.0000000000000000000000000000000000000000000000000000000000000000000
## 15   1.0000000000000000000000000000000000000000000000000000000000000000000
## 14   1.0000000000000000000000000000000000000000000000000000000000000000000
## 11   1.0000000000000000000000000000000000000000000000000000000000000000000
## 41   1.0000000000000000000000000000000000000000000000000000000000000000000
## 23   1.0000000000000000000000000000000000000000000000000000000000000000000
## 46   1.0000000000000000000000000000000000000000000000000000000000000000000
## 2    1.0000000000000000000000000000000000000000000000000000000000000000000
## 12   1.0000000000000000000000000000000000000000000000000000000000000000000
## 19   1.0000000000000000000000000000000000000000000000000000000000000000000
## 50   1.0000000000000000000000000000000000000000000000000000000000000000000
## 22   1.0000000000000000000000000000000000000000000000000000000000000000000
## 17   1.0000000000000000000000000000000000000000000000000000000000000000000
## 37   1.0000000000000000000000000000000000000000000000000000000000000000000
## 24   1.0000000000000000000000000000000000000000000000000000000000000000000
## 79   0.0000000000000000000000262236288591356553928327931221347340648501101190766250
## 74   0.0000000000000000000000837018763760443072188008166810672953064460678164369638 1
## 52   0.0000000000000000000011222106419760810517471855058134407505086275617574760610
## 99   0.0000000000000000000007949082017191751479543568405163887219057080707312427914 33
## 75   0.0000000000000000000003728187600470669819309225662974235524868545972209147916 7
## 97   0.0000000000000000000009332794169708623918315528863435816536766841595659397809
## 95   0.0000000000000000000003418864681643742342198868260156472267866354053058849516
## 87   0.0000000000000000000012159472067146619281341687414103045197111634194713957916
## 83   0.0000000000000000000037287594592108881510786486070519049624842130235356824 01
## 81   0.0000000000000000000033176605732616561428498819984175913404471336567896433250
## 90   0.0000000000000000000006071738760458991975481565774156915318462760807778109455
## 77   0.0000000000000000000019890331262526350511244120192565610297569768262095150694
## 89   0.0000000000000000000011852348239970473884176411900474466475034461502082801052
## 93   0.0000000000000000000030241787799541400894999400601455479402610734156109479534
## 57   0.0000000000000000000003745610344436067147430516562633495228541423056601021 10
## 69   0.0000000000000000000000527218968316169300090796630870696362061190784161
## 96   0.0000000000000000000021218877876473730678195911577717968288933565382234594655
## 68   0.0000000000000000000005258534878640861950501195031815950956011862061235585129 6
## 91   0.0000000000000000000009052311357590686281840354815250807965613006341177831 15
## 59   0.0000000000000000000030048480942165175058509816312354187932549695223593518184
## 56   0.0000000000000000000005826457805439250711053862873332742399095609187891341 31
## 100  0.0000000000000000000012785439594116801531497171094491832572380862633365092211
## 78   0.0000000000000000000000000661127995694483614470657065888315646166403
## 72   0.0000000000000000000037786622789293085110846713227354407286702332712834829563
## 61   0.0000000000000000000033137858348749568909003095192857358895572768122244330193
## 105  0.0000000000000000000000000000000000000000000000000000000000002381465466
## 111  0.0000000000000000000000000000000000000000000000000000000032126807052040
## 134  0.0000000000000000000000000000000000000000000000080703653912257091621897893679 0176
## 149  0.0000000000000000000000000000000000000000000000000000000000000002815583829
## 132  0.0000000000000000000000000000000000000000000000001088598271804970866462806111659532
```

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```
## 107 0.000000000000000000000000000000000000000000000000000000007746463294
## 126 0.000000000000000000000000000000000000000000000000000000000853193677034834
## 123 0.000000000000000000000000000000000000000000000000000000004651209530
## 137 0.000000000000000000000000000000000000000000000000000000002262681558
## 127 0.0000000000000000000000000000000000000000000000000000008444658742396864204
## 119 0.000000000000000000000000000000000000000000000000000000002076606019
## 124 0.000000000000000000000000000000000000000000000000000000000568104698907642292
## 146 0.000000000000000000000000000000000000000000000000000000000008199066982
## 121 0.000000000000000000000000000000000000000000000000000000003692246963
## 139 0.0000000000000000000000000000000000000000000000000000000007927746206717143
## 128 0.000000000000000000000000000000000000000000000000000000004402872027522259
## 140 0.000000000000000000000000000000000000000000000000000000000472184654461
## 138 0.000000000000000000000000000000000000000000000000000000000378092955691
## 113 0.000000000000000000000000000000000000000000000000000000021437107041
## 112 0.000000000000000000000000000000000000000000000000000000053316547278
## 135 0.000000000000000000000000000000000000000000000000000000016433015786961
## 145 0.000000000000000000000000000000000000000000000000000000002243000543
## 142 0.000000000000000000000000000000000000000000000000000000000177927911835
## 115 0.000000000000000000000000000000000000000000000000000000002079910903
## 125 0.000000000000000000000000000000000000000000000000000000008059199855
##                        [,2]                    [,3]
## 3   0.003018867947316927758 0.000000000000004791018489
## 43  0.003018596747285006137 0.000000000000004791984003
## 7   0.003018408113683918818 0.000000000000004792655733
## 13  0.003018998462927855071 0.000000000000004790553933
## 47  0.003018678143791182853 0.000000000000004791694187
## 6   0.003018505793858631062 0.000000000000004792307872
## 26  0.003018900720918553729 0.000000000000004790901829
## 49  0.003018960450819418041 0.000000000000004790689226
## 16  0.003018644384201117550 0.000000000000004791814386
## 4   0.003018632400360019268 0.000000000000004791857057
## 35  0.003018887206217239511 0.000000000000004790949935
## 15  0.003019186168705555260 0.000000000000004789885930
## 14  0.003018891309555647717 0.000000000000004790935329
## 11  0.003019013625659687332 0.000000000000004790499967
## 41  0.003018875269028066174 0.000000000000004790992426
## 23  0.003018865869502410960 0.000000000000004791025884
## 46  0.003018788314338226569 0.000000000000004791301967
## 2   0.003018964693423384534 0.000000000000004790674126
## 12  0.003018604800024557704 0.000000000000004791955329
## 19  0.003018958496321780521 0.000000000000004790696183
## 50  0.003018966133990109470 0.000000000000004790668998
## 22  0.003018533426217565475 0.000000000000004792209474
## 17  0.003018885344564763672 0.000000000000004790956561
## 37  0.003019164195768911027 0.000000000000004789964120
## 24  0.003018285104608955938 0.000000000000004793093852
## 79  0.999997806475269146453 0.000000006393802259179
## 74  0.999999734476035517794 0.000000000056897510900
## 52  0.999999777877691009564 0.000000000038165986506
## 99  0.999999812943166532797 0.000000000000005200771357
## 75  0.999999891091235659779 0.000000000000007654944742
## 97  0.999999751514523138596 0.000000000000049053418939
## 95  0.999999541655070434132 0.000000000000192872390413
## 87  0.999999788528448951830 0.000000000000034199559514
```

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```
## 83  0.999999891885625991073  0.000000000000007566831848
## 81  0.999999885281926848002  0.000000000000008708251923
## 90  0.999999677111058971057  0.000000000000088110150933
## 77  0.999999843464337234700  0.000000000000017447773324
## 89  0.999999785134580321255  0.000000000000035431438211
## 93  0.999999878589594382028  0.000000000000009883937256
## 57  0.999998234992982570901  0.000000000003932561885624
## 69  0.999850288044516921637  0.000000080405974255549657
## 96  0.999999848740189989371  0.000000000000016118538784
## 68  0.999999895718019393698  0.000000000000006221318258
## 91  0.999998969434449325178  0.000000000001180712611109
## 59  0.999999877932391312285  0.000000000000009994109308
## 56  0.999998651811591532379  0.000000000002153037424068
## 100 0.999999794908158157192  0.000000000000031935812336
## 78  0.976811776315324453712  0.000933364274273155323883
## 72  0.999999892405092571934  0.000000000000007469457558
## 61  0.999999886040282004451  0.000000000000008546874353
## 105 0.000000000009203512238  1.000000000000000000000
## 111 0.000000000661627496554  1.000000000000000000000
## 134 0.021317246216591638486  0.999015572442991550069456
## 149 0.000000000010113126003  1.000000000000000000000
## 132 0.003668042213437255981  0.999994418331938361071034
## 107 0.000000000017133038183  1.000000000000000000000
## 126 0.000000022199532582182  1.000000000000000000000
## 123 0.000000000012495922099  1.000000000000000000000
## 137 0.000000000008976839462  1.000000000000000000000
## 127 0.000000097245154489710  0.999999999999990674126593
## 119 0.000000000008532889761  1.000000000000000000000
## 124 0.000000030988278031576  0.999999999999999023003738
## 146 0.000000000016689510958  1.000000000000000000000
## 121 0.000000000011467057514  1.000000000000000000000
## 139 0.000000006986730407036  0.999999999999999933386619
## 128 0.000000005366989668853  0.999999999999999955591079
## 140 0.000000000099769033438  1.000000000000000000000
## 138 0.000000000100024068916  1.000000000000000000000
## 113 0.000000000025888399062  1.000000000000000000000
## 112 0.000000000039146416231  1.000000000000000000000
## 135 0.000000000492309675891  1.000000000000000000000
## 145 0.000000000008917742248  1.000000000000000000000
## 142 0.000000000064667671130  1.000000000000000000000
## 115 0.000000000008560618213  1.000000000000000000000
## 125 0.000000000016965694263  1.000000000000000000000
##
## $net.result[[2]]
##                                  [,1]                    [,2]
## 3   1.000000000000000000000000000000  0.000000449050697949567928
## 43  1.000000000000000000000000000000  0.000000247403261401342450
## 7   0.999999999999999777955395074968 7 0.000000165451589794152002
## 13  1.000000000000000000000000000000  0.000000682694967266456659
## 47  1.000000000000000000000000000000  0.000001044469108463030007
## 6   1.000000000000000000000000000000  0.000000359144780480453287
## 26  1.000000000000000000000000000000  0.000001948451366427771582
## 49  1.000000000000000000000000000000  0.000001530102977623172167
## 16  1.000000000000000000000000000000  0.000002050494999970288379
```

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```
## 4    1.000000000000000000000000000000 0.0000000209585514689942633
## 35   1.000000000000000000000000000000 0.00000004354707555520046949
## 15   1.000000000000000000000000000000 0.00000006235062375995381683
## 14   1.000000000000000000000000000000 0.00000005790073291238849128
## 11   1.000000000000000000000000000000 0.00000017487444402236844184
## 41   1.000000000000000000000000000000 0.00000006096153330100028327
## 23   1.000000000000000000000000000000 0.00000163471332599524848409
## 46   1.000000000000000000000000000000 0.00000021089495667663400756
## 2    1.000000000000000000000000000000 0.00000046551536072869904274
## 12   1.000000000000000000000000000000 0.00000033341988572547454544
## 19   1.000000000000000000000000000000 0.00000107476397438567002022
## 50   1.000000000000000000000000000000 0.00000069164618987707704369
## 22   1.000000000000000000000000000000 0.00000025537694263656672626
## 17   1.000000000000000000000000000000 0.00000109817383614650000156
## 37   1.000000000000000000000000000000 0.00000233934373938959459450
## 24   1.000000000000000000000000000000 0.00000118956463068278100109
## 79   0.0000000000000000004126377294 0.99999442717490760745846556
## 74   0.0000000000000000004373077777 0.99999991984967628866343131
## 52   0.0000000000000000004507305657 0.99999999911939082553047345
## 99   0.0000000000000000004666241279 0.99999999929954519473085454
## 75   0.0000000000000000004599354333 0.99999999979889542256472626
## 97   0.0000000000000000004525405027 0.99999999934287897573881316
## 95   0.0000000000000000004380798792 0.99999992954013483537067969
## 87   0.0000000000000000004428248576 0.99999996792494216801827676
## 83   0.0000000000000000004619161248 0.99999999853075705047444949
## 81   0.0000000000000000004583673887 0.99999999741913403461524016
## 90   0.0000000000000000004365202635 0.99999990857026588297884545
## 77   0.0000000000000000004319318478 0.99999980215590855703311516
## 89   0.0000000000000000004577218788 0.99999999713928655609152020
## 93   0.0000000000000000004574063873 0.99999996991508544041949491
## 57   0.0000000000000000004275028517 0.99999957994536903260751616
## 69   0.0000000000000000003731784755 0.99147442379743411233761212
## 96   0.0000000000000000004608285364 0.99999999982546667887106651
## 68   0.0000000000000000004640407531 0.99999999989492325269679900
## 91   0.0000000000000000004189487848 0.99999816118490691962961111
## 59   0.0000000000000000004536667088 0.99999999945198552175895661
## 56   0.0000000000000000004219645868 0.99999891110764260737653333
## 100  0.0000000000000000004527473798 0.99999999936445576054211411
## 78   0.0000000000000000003684385785 0.97857490018384618579716565
## 72   0.0000000000000000004612210295 0.99999999983599034969472541
## 61   0.0000000000000000004532671181 0.99999999941554948978961191
## 105  0.0000000000000000002256696050 0.00000000000002128768363333
## 111  0.0000000000000000003060862918 0.000060414679468309851341
## 134  0.0000000000000000003312256568 0.018773085164983448897003
## 149  0.0000000000000000002432912404 0.0000000000045415175654361
## 132  0.0000000000000000002709697918 0.00000008166999833574099
## 107  0.0000000000000000002635697358 0.0000000109261561588501211
## 126  0.0000000000000000002658070915 0.00000000201131568426037411
## 123  0.0000000000000000002240832047 0.0000000000000097417406191
## 137  0.0000000000000000002299019007 0.00000000000013448945457511
## 127  0.0000000000000000003265755079 0.006793387214986615872669
## 119  0.0000000000000000002183131581 0.00000000000000358305750811
## 124  0.0000000000000000003065717605 0.0000679465975672047467831
## 146  0.0000000000000000002436032090 0.00000000000478994831000511
```

```
## 121 0.0000000000000000000002339392176 0.000000000000289025874763
## 139 0.0000000000000000000003210076169 0.0019369125925664761191275
## 128 0.0000000000000000000003147783510 0.0004636582663012213476741
## 140 0.0000000000000000000002685966562 0.0000000046899656433325523
## 138 0.0000000000000000000002661530120 0.0000000022089374280399937
## 113 0.0000000000000000000002467674195 0.0000000000101325552299452
## 112 0.0000000000000000000002482190143 0.00000000014265326873619
## 135 0.0000000000000000000002590850275 0.0000000003084010505509788
## 145 0.0000000000000000000002244179291 0.0000000000000033867681013
## 142 0.0000000000000000000002698950339 0.0000000076737877949446879
## 115 0.0000000000000000000002225946820 0.00000000000000012720558511
## 125 0.0000000000000000000002491686073 0.000000000019703860668405
##                                 [,3]
## 3     0.0000012436573017667
## 43    0.0000023049537750849
## 7     0.0000034955795232532
## 13    0.0000008061100278795
## 47    0.0000005191039084561
## 6     0.0000015672070539386
## 26    0.0000002722519396514
## 49    0.0000003496377546738
## 16    0.0000002582408584265
## 4     0.0000027367224018786
## 35    0.0000012838208404267
## 15    0.0000000816801661636
## 14    0.0000009559692263011
## 11    0.0000003044948535519
## 41    0.0000009063337559679
## 23    0.0000003265058116851
## 46    0.0000027191366809715
## 2     0.0000011981580045926
## 12    0.0000016925264707755
## 19    0.0000005039664922683
## 50    0.0000007953143097654
## 22    0.0000022305052211623
## 17    0.0000004928511176402
## 37    0.0000002253117801688
## 24    0.0000004537140569628
## 79    0.0000033311068736146
## 74    0.0000000412918967344
## 52    0.0000000041988813507
## 99    0.0000000003056367986
## 75    0.0000000009105379576
## 97    0.0000000031012775405
## 95    0.0000000361360195407
## 87    0.0000000160025662865
## 83    0.0000000006579495079
## 81    0.0000000011787943915
## 90    0.0000000473206572173
## 77    0.0000001052043282836
## 89    0.0000000013113349116
## 93    0.0000000013815117106
## 57    0.0000002293371161781
## 69    0.0066040273475070355
```

```
## 96   0.0000000007863173216
## 68   0.0000000004650546286
## 91   0.0000010572475206265
## 59   0.0000000025699469848
## 56   0.0000006146807377817
## 100  0.0000000029959391175
## 78   0.0171893652937931442
## 72   0.0000000007372970170
## 61   0.0000000027470052294
## 105  0.9999999999999922284
## 111  0.9999529416774693980
## 134  0.9820902407313309990
## 149  0.9999999999980213605
## 132  0.9999999953438882816
## 107  0.9999999994195898356
## 126  0.9999999989083407925
## 123  0.9999999999999966693
## 137  0.9999999999999487077
## 127  0.9937509765357007696
## 119  0.9999999999999988898
## 124  0.9999468580033227250
## 146  0.9999999999979076737
## 121  0.9999999999998858691
## 139  0.9982956696133686858
## 128  0.9996120363009990406
## 140  0.9999999973815105747
## 138  0.9999999987971102122
## 113  0.9999999999954416463
## 112  0.9999999999934956474
## 135  0.9999999998432471671
## 145  0.9999999999999877875
## 142  0.9999999956512286570
## 115  0.9999999999999955591
## 125  0.9999999999909203741
##
## $net.result[[3]]
##                                     [,1]                   [,2]
## 3    0.9999967016889657056566420578747  0.00021242003682164
## 43   0.9999990461547673126219137884618  0.00009439536970808
## 7    0.9999996895747957914579728821991  0.00004544131397260
## 13   0.9999986463924651070023230658989  0.00053198909525623
## 47   0.9999990789908232979854574296041  0.00009330036257006
## 6    0.9999975991885114989798921669717  0.00003874098172140
## 26   0.9999949641160629232317091918957  0.00027896601809426
## 49   0.9999959687539972108538677275646  0.00024406177169200
## 16   0.9999995196691227050678207888267  0.00006135773913025
## 4    0.9999988546213731677170244438457  0.00010617219328313
## 35   0.9999959859580783705368389746581  0.00024103521988506
## 15   0.9999962781517360399519134261936  0.00103840141493914
## 14   0.9999932609167127006699615776597  0.00033749429189261
## 11   0.9999940680938012027567651784920  0.00031388507991280
## 41   0.9999980123586839075855436931306  0.00015331207947421
## 23   0.9999972085855168835166750795906  0.00019177479626165
## 46   0.9999980406443528258009223463886  0.00015046218526009
```

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```
## 2    0.99999200679276045722332355580875 0.00037714163661507
## 12   0.99999920633455929852573262905935 0.00008405785245099
## 19   0.99999735478985030123766364340554 0.00018555504095178
## 50   0.99999446962313476294781366959796 0.00029815448454211
## 22   0.99999971909900897681922060655779 0.00004278495396995
## 17   0.99999864081217526567968434392242 0.00012022312128195
## 37   0.99996694942057207100560844992287 0.00095707649289214
## 24   0.99999989775073827580342822329840 0.00002186426329393
## 79   0.00000000170500786986006762593625 0.99994928289105955
## 74   0.00000000504200654179988415017084 0.99998097780883211
## 52   0.00000002041015118553426611960448 0.99998603300981270
## 99   0.00007562439422996427228988031155 0.99686412157946780
## 75   0.00000001372468382344028910883546 0.99998936107744374
## 97   0.00000001870037037891463114438445 0.99998671620868895
## 95   0.00000008902349147479640759114457 0.99998493585097403
## 87   0.00000001210879969565757486429826 0.99998868118355388
## 83   0.00000001587953068948269782763392 0.99998828338466428
## 81   0.00000001235580106716062632727788 0.99998983057687552
## 90   0.00000000588423928626996332163391 0.99998175388157617
## 77   0.00000000496851411803427805533253 0.99998190709394608
## 89   0.00000006004720438157367232764866 0.99997117716212380
## 93   0.00000001283764113958397080210217 0.99998964099872600
## 57   0.00000001994278982091687095569520 0.99998364390920214
## 69   0.00000000000002527449480939386136 0.98213493929781326
## 96   0.00000004377690863619753229353954 0.99997676934029434
## 68   0.00000001468552355596045945369285 0.99998889130501689
## 91   0.00000000027484350723839039537687 0.99984695666253465
## 59   0.00000001182753737735454756049852 0.99998971769388978
## 56   0.00000000159317787696439825669836 0.99994989362806475
## 100  0.00000001593827964548085504596363 0.99998799731155419
## 78   0.00000000000033259622346383039221 0.98263412174760945
## 72   0.00000001557923746422315274814474 0.99998843430822770
## 61   0.00000000094774629889871966947610 0.99998851912021225
## 105  0.00000000000000000000005891057033 0.00000009596129914
## 111  0.00000000000000000000272406350370 0.00005202368020061
## 134  0.00000000000000000439219543520660 0.02315856901500062
## 149  0.00000000000000000000006184083976 0.00000011104747873
## 132  0.00000000000000000001399417441767 0.00025296059351645
## 107  0.00000000000000000000001283482963 0.00000043704706814
## 126  0.00000000000000000000029021060850 0.00001685846996126
## 123  0.00000000000000000000002556685099 0.00000037119432800
## 137  0.00000000000000000000011505860385 0.00000005626876699
## 127  0.00000000000000000003548006454438 0.00055188824666769
## 119  0.00000000000000000000017852342501 0.00000004054023653
## 124  0.00000000000000000000664621725580 0.00017062594798557
## 146  0.00000000000000000000006500942532 0.00000088845351136
## 121  0.00000000000000000000004348592210 0.00000026300132999
## 139  0.00000000000000000001430056261538 0.00021587895341258
## 128  0.00000000000000000000503755602178 0.00010879987515209
## 140  0.00000000000000000000024056546240 0.00000764707631434
## 138  0.00000000000000000000003273120920 0.00000211046773735
## 113  0.00000000000000000000004558910795 0.00000129767930144
## 112  0.00000000000000000000003175095736 0.00000151609839632
## 135  0.00000000000000000000001472840342 0.00000236363488528
```

```
## 145 0.00000000000000000000012670794484 0.00000005939724052
## 142 0.00000000000000000000079372867117 0.00001397234321093
## 115 0.00000000000000000000017060532090 0.00000004013691224
## 125 0.00000000000000000000002723385626 0.00000048448711106
##                      [,3]
## 3    0.00008216026595
## 43   0.00009530686941
## 7    0.00010543780603
## 13   0.00007340089443
## 47   0.00008393705102
## 6    0.00009847351742
## 26   0.00008193453365
## 49   0.00007332535883
## 16   0.00008409348999
## 4    0.00009551683143
## 35   0.00008214895083
## 15   0.00005924295537
## 14   0.00007909919330
## 11   0.00007073951418
## 41   0.00008234626811
## 23   0.00007738496739
## 46   0.00009205427056
## 2    0.00007793418694
## 12   0.00009275849243
## 19   0.00007591007710
## 50   0.00007616005125
## 22   0.00010052763433
## 17   0.00008096775997
## 37   0.00006294964880
## 24   0.00012839062427
## 79   0.00007528920231
## 74   0.00003041549547
## 52   0.00002005891566
## 99   0.00009508044486
## 75   0.00001698940103
## 97   0.00001966136632
## 95   0.00002377953920
## 87   0.00001821969144
## 83   0.00001791278423
## 81   0.00001669117319
## 90   0.00002897291236
## 77   0.00002924112096
## 89   0.00003006383547
## 93   0.00001685178287
## 57   0.00002328456582
## 69   0.02108409247241
## 96   0.00002607979960
## 68   0.00001733939654
## 91   0.00022145046402
## 59   0.00001691332923
## 56   0.00007506112354
## 100  0.00001849190574
## 78   0.02007867142421
## 72   0.00001776235592
```

```
## 61  0.00001895886905
## 105 0.99999965731266
## 111 0.99990674042703
## 134 0.97209250256530
## 149 0.99999960929928
## 132 0.99959849693759
## 107 0.99999891695409
## 126 0.99996988491053
## 123 0.99999899738077
## 137 0.99999976882318
## 127 0.99917013501291
## 119 0.99999981882808
## 124 0.99972953577599
## 146 0.99999773661916
## 121 0.99999921342631
## 139 0.99964861429939
## 128 0.99981838147022
## 140 0.99998468117727
## 138 0.99999559184749
## 113 0.99999698341881
## 112 0.99999667102407
## 135 0.99999547134705
## 145 0.99999975523668
## 142 0.99997194278695
## 115 0.99999982113348
## 125 0.99999873605211
##
## $net.result[[4]]
##                       [,1]                 [,2]                         [,3]
## 3   0.9998387206164147666695 0.0017876911964007 0.000000000000003440317141
## 43  0.9998387193673567985529 0.0017875242866687 0.000000000000003440693362
## 7   0.9998387083096716976627 0.0017869176356953 0.000000000000003442037185
## 13  0.9998387196178937233068 0.0017879222550180 0.000000000000003439785167
## 47  0.9998387257566390129430 0.0017879685412074 0.000000000000003439704105
## 6   0.9998386984687687162320 0.0017865703921665 0.000000000000003442795985
## 26  0.9998386943598095433220 0.0017868209373051 0.000000000000003442203118
## 49  0.9998387255873610879320 0.0017880531089438 0.000000000000003439510350
## 16  0.9998387240096519024140 0.0017876549019491 0.000000000000003440414465
## 4   0.9998387029027731021100 0.0017869853101946 0.000000000000003441860246
## 35  0.9998387048424897116660 0.0017871724932729 0.000000000000003441440220
## 15  0.9998387401602004675990 0.0017887758057202 0.000000000000003437918986
## 14  0.9998387357785269990980 0.0017883460671463 0.000000000000003438881943
## 11  0.9998387246423044993900 0.0017880550767884 0.000000000000003439502101
## 41  0.9998387189732110824640 0.0017874930821730 0.000000000000003440763873
## 23  0.9998387487255003813760 0.0017887000945293 0.000000000000003438125856
## 46  0.9998386923047082319730 0.0017864358555669 0.000000000000003443077796
## 2   0.9998387068438041591630 0.0017872615634435 0.000000000000003441244538
## 12  0.9998387106187875961180 0.0017873188485580 0.000000000000003441128294
## 19  0.9998387049758974409740 0.0017871813389031 0.000000000000003441421569
## 50  0.9998387182639643100400 0.0017877035258425 0.000000000000003440279706
## 22  0.9998387025790593796160 0.0017866301118986 0.000000000000003442674881
## 17  0.9998387189258527429910 0.0017873904123366 0.000000000000003440999138
## 37  0.9998387252554618020990 0.0017881450759711 0.000000000000003439299044
## 24  0.9998386540626064133970 0.0017846301189434 0.000000000000003447095215
```

```
## 79   0.00001583372609334607 0.9991045114056036 0.0006326525538122616072
## 74   0.0000529038195001206412 0.9998346321953676 0.0001071671913460453849
## 52   0.0001876603098873124555 0.9999802685654979 0.00001094593219767845253
## 99   0.0002451765383536070026 0.9999894882626565 0.00000545257734369506907
## 75   0.0002279222276488718925 0.9999870519974942 0.00000689174279041085843
## 97   0.0001350299187929255825 0.9999635208220464 0.00002131299697834276264
## 95   0.00005304158882303265932 0.9998373462353922 0.0001051379528717606958
## 87   0.0001716064530564091855 0.9999763955191397 0.00001331021851188127592
## 83   0.0002271055694747050011 0.9999869237077283 0.00000696800658545944644
## 81   0.0002003035804236571995 0.9999825020695082 0.00000961062781247421270
## 90   0.00006580256645985915415 0.9998819547203142 0.00007487955032595579850
## 77   0.0001379482143448085195 0.9999643944460185 0.00002079276145044800666
## 89   0.0001691660038585597125 0.9999757810548482 0.00001368489306589888469
## 93   0.0002031438904763333434 0.9999830764046698 0.00000926247723071939485
## 57   0.00005340393818458364704 0.9998442272719367 0.0001000171071630591895
## 69   0.00001105060015388672 0.9696905522849518 0.0251882084661339579467
## 96   0.0001895454157023082185 0.9999805393428246 0.00001078838407085416998
## 68   0.0002252002642934394824 0.9999866166794600 0.00000715096183048380028
## 91   0.000003219150427168444 0.9922406074233524 0.006077247868442885343764
## 59   0.0002022548195139393944 0.9999829230795859 0.00000935428456980500379
## 56   0.000006274509592464461 0.9968224844274488 0.002387186462133338449999
## 100  0.0001555655314819590344 0.9999716005649320 0.00001626848190746797202
## 78   0.00001413218241897899 0.9786603597655311 0.0173531949384290555549217
## 72   0.0002323941283379850134 0.9999876913568855 0.00000651409719413300430
## 61   0.0001530488941905314337 0.9999700663134407 0.00001726193046161793353
## 105  0.000000000002539625692 0.0000008015989620 0.9999995644613935974476
## 111  0.00000000140998489621 0.0003929743697573 0.9996840799597294104696
## 134  0.00000004676971630925 0.0330760107999929 0.9684674896543615796318
## 149  0.000000000003227190336 0.0000013019933856 0.9999992602539778951964
## 132  0.00000000276036892820 0.0009331900331418 0.9992237821146435772234
## 107  0.00000000003915849652 0.0000018131717577 0.9999989438204934799614
## 126  0.0000000000040515269706 0.0000682400196798 0.9999498546306081481205
## 123  0.0000000000386291950 0.0000017980302188 0.9999989515936060779921
## 137  0.00000000002576481348 0.0000008296767839 0.9999995475538423376794
## 127  0.00000000639540376743 0.0027893412589323 0.9975721097505003687189
## 119  0.000000000002330772130 0.0000006680032188 0.9999996433765987458031
## 124  0.00000000224368244011 0.0007030901451442 0.9994230431881367948676
## 146  0.0000000000007628738937 0.0000057776764436 0.9999963208949578241657
## 121  0.00000000003786177005 0.0000017450520213 0.9999998942782012194888
## 139  0.00000000279327252279 0.0009632222054058 0.9991958831962853837538
## 128  0.00000000178730012120 0.0005305872768360 0.9995686962205657666302
## 140  0.00000000027437183476 0.0000399175018505 0.9999714208233598800035
## 138  0.0000000000098004860 52 0.0000084730531057 0.9999944746596545197547
## 113  0.00000000007685956963 0.0000057925334893 0.9999963148422448266927
## 112  0.00000000007361174423 0.0000053611192813 0.9999966104002162570196
## 135  0.00000000008250079269 0.0000063550430450 0.9999959413822875342603
## 145  0.00000000002625913361 0.0000008630558302 0.9999995275957869189653
## 142  0.0000000006367132753 8 0.0001334723466254 0.9998979941849498453976
## 115  0.000000000002366004741 0.0000006891931487 0.9999996309749089595797
## 125  0.0000000000469884861 0 0.0000025598163864 0.9999984642032450077309
##
## $net.result[[5]]
##                                                                          [,1]
## 3   1.00000000000000000000000000000000000000000000000000000000000000000000000
```

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```
## 43   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 7    1.00000000000000000000000000000000000000000000000000000000000000000000000
## 13   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 47   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 6    1.00000000000000000000000000000000000000000000000000000000000000000000000
## 26   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 49   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 16   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 4    1.00000000000000000000000000000000000000000000000000000000000000000000000
## 35   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 15   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 14   0.99999999999999977795539507496869191527366638183593750000000000000000000
## 11   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 41   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 23   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 46   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 2    1.00000000000000000000000000000000000000000000000000000000000000000000000
## 12   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 19   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 50   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 22   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 17   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 37   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 24   1.00000000000000000000000000000000000000000000000000000000000000000000000
## 79   0.00000000000000000000000000657049392308596120088456522078147698349956568290
## 74   0.00000000000000000000000001805226362746385982015151964476293649965288159825815
## 52   0.00000000000000000000000001186161224835442398318637661519291235352513816254100981
## 99   0.00000000000000000000000011242834203402756621874264449148193270963490366195212900
## 75   0.00000000000000000000000011250274320543893427291486554000998850118126485158884133
## 97   0.00000000000000000000000021665864412225880226906029383626612263896887148054345290
## 95   0.00000000000000000000000002284228583139487228637893997909678068236198852416444000
## 87   0.00000000000000000000000002161036024329608630610136804946790460023460824565549800
## 83   0.00000000000000000000000002497845470868557178569713225902084684164343592393070318100
## 81   0.00000000000000000000000004544799295155226602502317669397166521351603111201221724000
## 90   0.00000000000000000000000000982724923067074842534448193245452613828695930401239300
## 77   0.00000000000000000000000000304290938691810743694665648371875776690651004165670000
## 89   0.00000000000000000000000013137914319046458916937600314506107602049413132569800158
## 93   0.00000000000000000000000046538486711251334121402373925076075658216254360825936020
## 57   0.00000000000000000000000000010267806398005115405388794309567538719061639788442920
## 69   0.00000000000000000000000000000013201822026740389049895791874121956497
## 96   0.00000000000000000000000023367296545478819460651876810301154899837034802377809954
## 68   0.00000000000000000000000003865192618840242190096445968938513560861027801207175512500
## 91   0.00000000000000000000000000024483741421883787814706511190473366162071983706614
## 59   0.00000000000000000000000006445900578203855588717020921041695407326039588724578410
## 56   0.00000000000000000000000000094071885690741089812416208397546602836631019659253
## 100  0.00000000000000000000000002100289008337608200865779873138581804349616852992321013
## 78   0.00000000000000000000000000011797666524136176712586306421154431950
## 72   0.00000000000000000000000021685423315983133119090001670393523523064559844908296063
## 61   0.00000000000000000000000000127250512604372530495016031738644113390469347235054218
## 105  0.00000000000000000000000000000000000000000000000000000042487928896
## 111  0.00000000000000000000000000000000000000000000009981040716833132498282400
## 134  0.00000000000000000000000000000000000000000000001602429994578101450613247561373300
## 149  0.00000000000000000000000000000000000000000000000000006704230288560
## 132  0.00000000000000000000000000000000000000000000000000000000473535723263193
```

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```
## 107 0.0000000000000000000000000000000000000000000000000009658515768524830175
## 126 0.0000000000000000000000000000000000000000000000000000000004880345923029
## 123 0.0000000000000000000000000000000000000000000000000000000000005948741390
## 137 0.0000000000000000000000000000000000000000000000000000000000000141283446798
## 127 0.0000000000000000000000000000000000000000000001274230342299146737510034414
## 119 0.0000000000000000000000000000000000000000000000000000000000000001748334186
## 124 0.0000000000000000000000000000000000000000000000000019441781974697882833689419
## 146 0.0000000000000000000000000000000000000000000000000000000002892049105211257
## 121 0.0000000000000000000000000000000000000000000000000000000000000992566653299
## 139 0.0000000000000000000000000000000000000000000005600070503505830489825244352847
## 128 0.0000000000000000000000000000000000000000000034460780660608107883510337588
## 140 0.0000000000000000000000000000000000000000000000000000000000095129716682849135
## 138 0.0000000000000000000000000000000000000000000000000000000078780782055356921
## 113 0.0000000000000000000000000000000000000000000000000000000000169534499961265
## 112 0.0000000000000000000000000000000000000000000000000000000000015397421599733404
## 135 0.0000000000000000000000000000000000000000000000000000000000012694912682180564
## 145 0.0000000000000000000000000000000000000000000000000000000000000080204612956
## 142 0.0000000000000000000000000000000000000000000000000000000002759724463151140899
## 115 0.0000000000000000000000000000000000000000000000000000000000000285806269564
## 125 0.0000000000000000000000000000000000000000000000000000000000000001348649721914
##                               [,2]                              [,3]
## 3     0.0032420501357849902494 0.0000000000000000000000001465915885
## 43    0.0032420222202458313411 0.0000000000000000000000001479335897
## 7     0.0032419216423597006261 0.0000000000000000000000001453511968
## 13    0.0032421250992097352602 0.0000000000000000000000001486209914
## 47    0.0032419986876772279374 0.0000000000000000000000001435422823
## 6     0.0032420303205172771275 0.0000000000000000000000001428520292
## 26    0.0032419172861832983891 0.0000000000000000000000001470091242
## 49    0.0032420664043546036647 0.0000000000000000000000001434400889
## 16    0.0032421887354238056351 0.0000000000000000000000001422213500
## 4     0.0032419130069710221965 0.0000000000000000000000001479804921
## 35    0.0032419641362964168179 0.0000000000000000000000001466162158
## 15    0.0032422211012513683925 0.0000000000000000000000001425490570
## 14    0.0032424587403479276405 0.0000000000000000000000001521702252
## 11    0.0032420838743395428115 0.0000000000000000000000001433215316
## 41    0.0032420568605750032902 0.0000000000000000000000001440527474
## 23    0.0032421294653047915031 0.0000000000000000000000001447606651
## 46    0.0032419635187381210840 0.0000000000000000000000001470520311
## 2     0.0032420453195870502227 0.0000000000000000000000001472826478
## 12    0.0032418773789347154167 0.0000000000000000000000001453651973
## 19    0.0032420818272221735290 0.0000000000000000000000001428247230
## 50    0.0032420293897690733581 0.0000000000000000000000001451372633
## 22    0.0032420113389580451634 0.0000000000000000000000001433407388
## 17    0.0032421482747579445128 0.0000000000000000000000001427179685
## 37    0.0032421400119905970094 0.0000000000000000000000001435559311
## 24    0.0032417965765249982280 0.0000000000000000000000001442648635
## 79    0.9999999720272217951233 0.0000000000000106746683194901242793
## 74    0.9999999977635853909419 0.0000000000000074375722621468629
## 52    0.9999999997687814001778 0.0000000000000007071369604260
## 99    0.9999999999466435696149 0.0000000000000000009118455263
## 75    0.9999999998986239813092 0.0000000000000000299651054555
## 97    0.9999999998379178745011 0.0000000000000000003626478995872
## 95    0.9999999992884640587220 0.0000000000000000002797439437392013
## 87    0.9999999989156107549348 0.0000000000000000001774567868802162
```

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```
## 83   0.999999999992424393191470  0.000000000000000000000000097559743892
## 81   0.999999999989438670411346  0.000000000000000000000001577243448083
## 90   0.999999999918167348234022  0.000000000000000000001146093161506872
## 77   0.999999998449387916821252  0.000000000000000012859440158542530624
## 89   0.999999999990566323937458  0.000000000000000000000000245858326414
## 93   0.999999999882761336778000  0.000000000000000000000001312591014274
## 57   0.999999995919264472732380  0.000000000000000000097271654424855880
## 69   0.990901349013337817694950  0.006769827799385288178216080190452430500000000000305
## 96   0.999999999991983212765945  0.000000000000000000000000102657810808
## 68   0.999999999993249488738911  0.000000000000000000000000000049778281940
## 91   0.999999999088132873747981  0.000000000000000003929713389979302432800000000000500000500
## 59   0.999999999973228592686780  0.000000000000000000000018454807827748
## 56   0.999999999297403219244984  0.000000000000000004351387422537921301
## 100  0.999999999984129939178956  0.000000000000000000000003955462089295
## 78   0.969551179963977771691930  0.000163435543285809348592121925669573560000000000500
## 72   0.999999999991868748772106  0.000000000000000000000000116037000753
## 61   0.999999999982070297832593  0.000000000000000000000677514965773315
## 105  0.000000000000013040573347  1.000000000000000000000000000000000000
## 111  0.000001762637946934388902  0.999999999995051069854543090220540761948
## 134  0.028384045577996716556948  0.999473630337360474662489195907255634670000000000500
## 149  0.000000000000153059859907  1.000000000000000000000000000000000000
## 132  0.000000000011988100657600  1.000000000000000000000000000000000000
## 107  0.000000028823424826315060  1.000000000000000000000000000000000000
## 126  0.000000000001415272552611  1.000000000000000000000000000000000000
## 123  0.000000000000005234219900  1.000000000000000000000000000000000000
## 137  0.000000000000224051004480  1.000000000000000000000000000000000000
## 127  0.001812459641392310779120  0.999997749905777832957198825170053169130000000000500
## 119  0.000000000000031163996840  1.000000000000000000000000000000000000
## 124  0.000013928365965782475080  0.999999999991259902465401410154299810529
## 146  0.000000000037287554104120  1.000000000000000000000000000000000000
## 121  0.000000000000580649318530  1.000000000000000000000000000000000000
## 139  0.013209627341187314339410  0.999768104199878025539760528772603720400000000000500
## 128  0.000769407747615355312210  0.999999407467150769335262339154724031690000000000500
## 140  0.000000000238620916555030  1.000000000000000000000000000000000000
## 138  0.000000000239775343783610  1.000000000000000000000000000000000000
## 113  0.000000000008479125244230  1.000000000000000000000000000000000000
## 112  0.000000000032100650505180  1.000000000000000000000000000000000000
## 135  0.000000000036025354403530  1.000000000000000000000000000000000000
## 145  0.000000000000169480614110  1.000000000000000000000000000000000000
## 142  0.000000005020764913133210  1.000000000000000000000000000000000000
## 115  0.000000000000342694224220  1.000000000000000000000000000000000000
## 125  0.000000000002185885989250  1.000000000000000000000000000000000000
##
##
## $weights
## $weights[[1]]
## $weights[[1]][[1]]
##               [,1]          [,2]          [,3]          [,4]          [,5]
## [1,] 2.814934231   2.0629438824  -0.1443406321   0.9428164435   0.2480356011
## [2,] 3.257206789   0.7019152969  -0.2515157066   0.2108354600   0.4489698492
## [3,] 4.934118192  -0.9247935005  -0.8184305692 -35.0933292850   0.1347821321
## [4,] 4.607308391  -0.6369430829   0.4785367375   9.9058171995  -0.4184702513
## [5,] 5.197687735  -0.7752154839   1.0735646356  34.5027685288  -0.7095907954
##
```

```
## $weights[[1]][[2]]
##                 [,1]            [,2]            [,3]
## [1,]  -1.5471547680   -1.2296023119    4.522703985
## [2,]   0.9773255872   -0.4953280479    4.278653032
## [3,]   6.8279343160   -7.5756260975  -11.028771568
## [4,] -12.6671902066   10.4701990764   84.213170141
## [5,]   0.4920808490   12.1125267535   86.092082722
## [6,]   7.5984631896  -22.7270743759  -33.620619436
##
## $weights[[1]][[3]]
##              [,1]          [,2]           [,3]
## [1,]  14.64915220  -19.26757100   -0.5530993203
## [2,]  22.08828067   13.46791293  -30.1167779982
## [3,] -84.86383426  -28.33947932   49.0659034210
## [4,] -85.70808484   22.07784366   -0.0667583728
##
##
## $weights[[2]]
## $weights[[2]][[1]]
##                 [,1]           [,2]          [,3]          [,4]           [,5]
## [1,]  -0.5042759168   1.4898645554  3.816005761   3.2855368125   0.1800002857
## [2,]  -0.6509581474   0.2932466486  3.960686899  -0.1517217758  -0.3501270854
## [3,]   7.1323330228   0.2853556537  3.565481347   6.2051581102  -1.8262778687
## [4,]  -8.1569478874  -0.4963126723  4.434744588  -1.5880497186   1.1685009009
## [5,]  -6.1794229309  -1.2965505619  5.562561806  -7.3909290550   0.8588273632
##
## $weights[[2]][[2]]
##              [,1]           [,2]          [,3]
## [1,]   0.2078055862    0.3768459922   24.309045143
## [2,]  49.8705447893    8.5323756817  -76.581724547
## [3,]  23.8631422107  -13.8771703015  -21.291715709
## [4,]   0.8464179488    0.9833075664   23.470053821
## [5,]   7.1397207124    1.8212323108   -9.587198317
## [6,]   3.2550687942    5.9015423752   86.374200626
##
## $weights[[2]][[3]]
##               [,1]           [,2]          [,3]
## [1,]  16.3534495476   -1.990420629   -1.537013346
## [2,]  20.5447310746   -1.829847091  -23.234605342
## [3,]  -0.7515042495  -54.896775577   56.820444918
## [4,] -86.0115162908   25.132037752    2.622369969
##
##
## $weights[[3]]
## $weights[[3]][[1]]
##                 [,1]           [,2]           [,3]           [,4]
## [1,]   0.04767506233   0.7292457051   0.12723040201  -0.2969500334
## [2,]   0.92571084699   0.4894392505  -0.99626221274   0.3356475517
## [3,]   0.38807050083  -0.4381030434  -0.08120691129   3.9278217224
## [4,]  -1.01401119664  -0.5223428996   0.98894126609  -2.5476687735
## [5,]  -1.27355597137  -0.8745427151   0.42718616343  -2.8185465734
##                 [,5]
## [1,]   1.5174146089
## [2,]   0.4545979264
```

```
## [3,]   0.1284877295
## [4,] -0.4415356247
## [5,] -2.0930626621
##
## $weights[[3]][[2]]
##                [,1]          [,2]         [,3]
## [1,]  -1.730045139    5.100451188 -3.200755507
## [2,]   7.887891024   -9.020166410 -4.634292788
## [3,]   2.174867626   -4.492852368 -3.658356092
## [4,]   2.203725704    4.056986866 -3.034467108
## [5,] -10.751719449  -33.203537882 13.472740076
## [6,]   3.279062534   -1.511579730 -2.273014964
##
## $weights[[3]][[3]]
##                 [,1]          [,2]         [,3]
## [1,]   0.05155445056  -1.019962082 -1.773274904
## [2,] -18.33564311888  12.595277607 -9.281363866
## [3,] -36.88039533517 -25.358941852 24.267322793
## [4,]  29.95864894186 -18.915510754 -4.270714949
##
##
## $weights[[4]]
## $weights[[4]][[1]]
##                 [,1]           [,2]            [,3]           [,4]
## [1,] -0.5297016252  -1.2620016387   -1.172828620924 -0.2828118577
## [2,]  0.1868873173  -0.5112522279    0.009602561267  1.2510893738
## [3,] -0.6160282140  -2.0050287275  -10.084712707462  0.2383168717
## [4,]  0.7589005238   2.1557744975    8.909588471609 -1.2081217770
## [5,]  3.0899050588   0.6705403478   11.759005832925 -1.7564612214
##                 [,5]
## [1,] -0.8239487302
## [2,]  0.4881641570
## [3,] -0.5303395586
## [4,]  0.4908869862
## [5,]  0.5167885515
##
## $weights[[4]][[2]]
##                 [,1]          [,2]         [,3]
## [1,]  -0.4894146642    8.020073312  1.3659909377
## [2,]   0.5715668154  -13.716535396 -1.3349760644
## [3,]   4.7212392920  -18.047043037 -3.4118143183
## [4,]  -1.1210043174  -17.022034325 -0.1971926248
## [5,] -10.9016998213   15.760940726  7.4247120171
## [6,]   1.3143314659    3.048009738  0.2812238291
##
## $weights[[4]][[3]]
##                 [,1]          [,2]          [,3]
## [1,]  -8.9043488107   0.5924964327   0.6476463353
## [2,] -18.2224281251 -15.7793322139  15.2814330984
## [3,]  17.0317223564 -17.8556634284 -18.8046731189
## [4,]   0.6057104662  10.9416969324 -12.8476678411
##
##
## $weights[[5]]
```

```
## $weights[[5]][[1]]
##               [,1]          [,2]         [,3]          [,4]
## [1,] -1.41302156270  0.3911430324  2.4977241436  0.15920524871
## [2,] -0.44420485881  9.5013591835  0.2296401329  0.09517618193
## [3,]  0.05822811791 -2.8344897676  0.3981165014  1.94292105372
## [4,]  0.86745255948  3.6852790238 -0.7291702202 -0.83481421132
## [5,] -0.06632632924  3.3178485900 -1.0201474476 -2.55786175456
##               [,5]
## [1,]  2.0398059586
## [2,] -0.2577052211
## [3,] -0.5893741921
## [4,] -0.2011637848
## [5,] -0.7177044390
##
## $weights[[5]][[2]]
##               [,1]          [,2]        [,3]
## [1,]  2.4789548931 -1.0558583409  11.82087996
## [2,]  5.4474197919 -4.1895719329  82.92836010
## [3,] -0.7832476324 -0.4034853302  46.98981375
## [4,] -9.4406342777  7.2121142144 -20.94055700
## [5,] -5.9087539072  4.7393411270 -90.23272341
## [6,]  6.6944171044 -12.6147395041 -49.61245604
##
## $weights[[5]][[3]]
##               [,1]          [,2]         [,3]
## [1,]   1.842672701 -5.0968542529   0.5147017256
## [2,] -74.581504738 -55.8653460818  66.8772024216
## [3,]  34.933077386 -0.6312797032 -66.9447387504
## [4,] -96.033150964  29.4340613419   0.9914811587
##
##
##
## $startweights
## $startweights[[1]]
## $startweights[[1]][[1]]
##               [,1]          [,2]         [,3]          [,4]
## [1,] -0.56047564655  1.7150649869  1.2240817974  1.7869131368
## [2,] -0.23017748948  0.4609162060  0.3598138271  0.4978504782
## [3,]  1.55870831415 -1.2650612346  0.4007714506 -1.9666171566
## [4,]  0.07050839142 -0.6868528519  0.1106827159  0.7013559016
## [5,]  0.12928773516 -0.4456619701 -0.5558411348 -0.4727914077
##               [,5]
## [1,] -1.0678237060
## [2,] -0.2179749147
## [3,] -1.0260044483
## [4,] -0.7288912293
## [5,] -0.6250392678
##
## $startweights[[1]][[2]]
##               [,1]          [,2]        [,3]
## [1,] -1.6866933107 -0.2950714830 -0.06191171058
## [2,]  0.8377870445  0.8951256610 -0.30596266374
## [3,]  0.1533731178  0.8781334875 -0.38047100101
## [4,] -1.1381369370  0.8215810816 -0.69470697892
```

```
## [5,]   1.2538149211   0.6886402541 -0.20791727802
## [6,]   0.4264642215   0.5539176535 -1.26539635157
##
## $startweights[[1]][[3]]
##                [,1]           [,2]          [,3]
## [1,]   2.1689559653 -0.46665535362 -0.02854675535
## [2,]   1.2079619983  0.77996511834 -0.04287045729
## [3,]  -1.1231085832 -0.08336906647  1.36860228401
## [4,]  -0.4028848353  0.25331851399 -0.22577098566
##
##
## $startweights[[2]]
## $startweights[[2]][[1]]
##                [,1]          [,2]         [,3]          [,4]          [,5]
## [1,]   1.5164706044  0.3796394828 0.30352864140 -0.4910311661  1.0255713697
## [2,]  -1.5487528042 -0.5023234531 0.44820977863 -2.3091688756 -0.2847730071
## [3,]   0.5846137496 -0.3332073837 0.05300422673  1.0057385245 -1.2207177123
## [4,]   0.1238542438 -1.0185753831 0.92226746788 -0.7092007626  0.1813034797
## [5,]   0.2159415687 -1.0717912265 2.05008468563 -0.6880086165 -0.1388913624
##
## $startweights[[2]][[2]]
##                [,1]          [,2]         [,3]
## [1,]   0.0057641859  1.0968390131  0.2387317351
## [2,]   0.3852804011  0.4351814908 -0.6279060760
## [3,]  -0.3706600318 -0.3259315855  1.3606524485
## [4,]   0.6443765485  1.1488076185 -0.6002595871
## [5,]  -0.2204865618  0.9935038560  2.1873329930
## [6,]   0.3317819639  0.5483969595  1.5326106262
##
## $startweights[[2]][[3]]
##                [,1]           [,2]          [,3]
## [1,]  -0.2357003591 -0.24669187846 -0.7849044695
## [2,]  -1.0264209003 -0.34754259940 -1.6679419366
## [3,]  -0.7104065637 -0.95161856727 -0.3802265203
## [4,]   0.2568837092 -0.04502772481  0.9189966091
##
##
## $startweights[[3]]
## $startweights[[3]][[1]]
##                 [,1]          [,2]          [,3]           [,4]
## [1,]  -0.57534696261  0.3011533622  0.1176465971 -0.65194990170
## [2,]   0.60796432223  0.1056761941 -0.9474746142  0.23538657228
## [3,]  -1.61788270829 -0.6407060083 -0.4905574437  0.07796084956
## [4,]  -0.05556196552 -0.8497043460 -0.2560921922 -0.96185663413
## [5,]   0.51940720394 -1.0241287906  1.8438620052 -0.07130808612
##                 [,5]
## [1,]   1.44455085842
## [2,]   0.45150405308
## [3,]   0.04123292199
## [4,]  -0.42249683234
## [5,]  -2.05324722154
##
## $startweights[[3]][[2]]
##                 [,1]          [,2]          [,3]
```

```
## [1,]   1.1313372134 -0.2621974894   0.6879167730
## [2,]  -1.4606400709 -1.5721441591   2.1001089405
## [3,]   0.7399475109 -1.5146676538  -1.2870304760
## [4,]   1.9091035692 -1.6015361736   0.7877388475
## [5,]  -1.4438931610 -0.5309065222   0.7690422410
## [6,]   0.7017843354 -1.4617555850   0.3322025790
##
## $startweights[[3]][[3]]
##                [,1]          [,2]          [,3]
## [1,] -1.0083766083 -0.3724387561 -1.0491770067
## [2,] -0.1194526066  0.9769733867 -1.2601552448
## [3,] -0.2803953352 -0.3745808578  3.2410399349
## [4,]  0.5629895332  1.0527114656 -0.4168575882
##
##
## $startweights[[4]]
## $startweights[[4]][[1]]
##                [,1]             [,2]            [,3]            [,4]
## [1,]  0.2982275915 -0.21538050764 -1.09599626707 -1.0633261340
## [2,]  0.6365696740  0.06529303353  0.03778839917  1.2631851761
## [3,] -0.4837806257 -0.03406725374  0.31048074944 -0.3496503880
## [4,]  0.5168620443  2.12845189902  0.43652347891 -0.8655128627
## [5,]  0.3689645274 -0.74133609627 -0.45836533271 -0.2362795689
##                [,5]
## [1,] -0.1971758943
## [2,]  1.1099202897
## [3,]  0.0847372922
## [4,]  0.7540537852
## [5,] -0.4992920172
##
## $startweights[[4]][[2]]
##                 [,1]          [,2]          [,3]
## [1,]  0.21444530958  0.6007088237 -0.2651450567
## [2,] -0.32468591149 -1.2512713616  0.5431940592
## [3,]  0.09458352817 -0.6111659167 -0.4143399479
## [4,] -0.89536335798 -1.1854800846 -0.4762468946
## [5,] -1.31080153333  2.1988103489 -0.7886028379
## [6,]  1.99721338475  1.3124129764 -0.5946172675
##
## $startweights[[4]][[3]]
##                 [,1]          [,2]          [,3]
## [1,]  1.65090746734  1.2324758785 -0.4411632169
## [2,] -0.05402812509 -0.5160638309 -0.7230659699
## [3,]  0.11924523643 -0.9925071504 -1.2362731189
## [4,]  0.24368742960  1.6756969324 -1.2847157223
##
##
## $startweights[[5]]
## $startweights[[5]][[1]]
##                [,1]          [,2]           [,3]            [,4]
## [1,] -0.5739734793  0.05974993738  1.95529396549 -1.3170161323
## [2,]  0.6179858172 -0.70459646368 -0.09031959397 -0.1829253884
## [3,]  1.1098481389 -0.71721816157  0.21453882663  0.4189824049
## [4,]  0.7075883538  0.88465049898 -0.73852770474  0.3243043442
```

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```
## [5,] -0.3636572971 -1.01559257860 -0.57438868976 -0.7815364871
##               [,5]
## [1,] -0.7886219709
## [2,] -0.5021987183
## [3,]  1.4960606698
## [4,] -1.1373036207
## [5,] -0.1790515944
##
## $startweights[[5]][[2]]
##              [,1]            [,2]            [,3]
## [1,]  1.9023618217 -0.56187636355  0.63075411565
## [2,] -0.1009748853 -0.34391723413 -0.11363989551
## [3,] -1.3598407038  0.09049664714 -1.53290200289
## [4,] -0.6647694353  1.59850877115 -0.52111731755
## [5,]  0.4854599789 -0.08856511214 -0.48987045314
## [6,] -0.3756028717  1.08079949615  0.04715443276
##
## $startweights[[5]][[3]]
##              [,1]            [,2]           [,3]
## [1,]  1.3001986777 -1.75652739556  0.9625279685
## [2,]  2.2930789738 -0.38877986407  0.6843094294
## [3,]  1.5475810590  0.08920722307 -1.3952743498
## [4,] -0.1331509643  0.84501300407  0.8496430456
##
##
##
## $generalized.weights
## $generalized.weights[[1]]
##              [,1]            [,2]           [,3]           [,4]
## 3           NaN             NaN            NaN            NaN
## 43          NaN             NaN            NaN            NaN
## 7           NaN             NaN            NaN            NaN
## 13          NaN             NaN            NaN            NaN
## 47          NaN             NaN            NaN            NaN
## 6           NaN             NaN            NaN            NaN
## 26          NaN             NaN            NaN            NaN
## 49          NaN             NaN            NaN            NaN
## 16          NaN             NaN            NaN            NaN
## 4           NaN             NaN            NaN            NaN
## 35          NaN             NaN            NaN            NaN
## 15          NaN             NaN            NaN            NaN
## 14          NaN             NaN            NaN            NaN
## 11          NaN             NaN            NaN            NaN
## 41          NaN             NaN            NaN            NaN
## 23          NaN             NaN            NaN            NaN
## 46          NaN             NaN            NaN            NaN
## 2           NaN             NaN            NaN            NaN
## 12          NaN             NaN            NaN            NaN
## 19          NaN             NaN            NaN            NaN
## 50          NaN             NaN            NaN            NaN
## 22          NaN             NaN            NaN            NaN
## 17          NaN             NaN            NaN            NaN
## 37          NaN             NaN            NaN            NaN
## 24          NaN             NaN            NaN            NaN
```

```
## 79   11.1232584203    2.66182545528   -12.5921806562    -21.3590492657
## 74    4.6809877988    1.94460280484    -5.5699340693     -9.9108627421
## 52    3.8711979177    1.59975294286    -4.5984765604     -8.1798320513
## 99   25.7029558881   35.32940339896   -35.5423195138    -70.6873628854
## 75    1.2425657633    0.68672467555    -1.5168271307     -2.7516081090
## 97    4.3790235209    1.78511440456    -5.1957409817     -9.2346648838
## 95    6.6925435376    2.78586338882    -7.9507085038    -14.1342610119
## 87    3.7496233397    1.53844923790    -4.4614293623     -7.9333614719
## 83    1.1430777087    0.57616770053    -1.3824808042     -2.4912254764
## 81    1.2730547514    0.55292540503    -1.5201271395     -2.7110404638
## 90    5.5308600195   -3.77117215025    -4.8198738826     -5.6478254912
## 77    2.6305190529   -2.73731341556    -2.0298542934     -1.7710830079
## 89    3.7699405888    1.50086900563    -4.4601249215     -7.9152926033
## 93    1.5257225059    0.62772504734    -1.8165979978     -3.2310700766
## 57   10.0030916435    5.20991896206   -12.0500747501    -21.7504742027
## 69   60.8104192033   17.88548594537   -66.2585046286   -114.8343459121
## 96    2.4312977701    0.93841923340    -2.8723158793     -5.0888588387
## 68    2.6965177424    3.06583436456    -3.6036385679     -7.0006419166
## 91    9.3046192510    3.23539331382   -10.8546374690    -18.9680536457
## 59    1.5558883418    0.62674413524    -1.8525723414     -3.2918660687
## 56    9.9050233818    4.44543250125   -11.8207198767    -21.1176528092
## 100   3.6779760624    1.47726682256    -4.3644374981     -7.7513236455
## 78   90.3102035976   66.83687179127  -109.5232102919   -209.2837325918
## 72    1.1533162710    0.61678112135    -1.4030957960     -2.5391407974
## 61    1.2880030798    1.20116370065    -1.7032357832     -3.3269146498
## 105   0.5373215579    0.31255465226    -0.6272912800     -1.1377187753
## 111  30.2833334481   14.07186442154   -33.9517523109    -60.4546222569
## 134 108.3115808095   50.55235714732  -122.6350604803   -221.2463180649
## 149   0.9034354690    0.73775224835    -1.0975037977     -2.0531208993
## 132  85.3264692921 1224.37599704993  -434.5293582665  -1340.2045569262
## 107   4.0458455331    1.87404495352    -4.6543025658     -8.3043537601
## 126  41.2014807885   17.53023346018   -45.6933787187    -80.8129366589
## 123   2.8385416000    0.90777273974    -3.1144873713     -5.4220874854
## 137   0.3576633357    0.30671135297    -0.4383247454     -0.8242133428
## 127  67.6455744126   22.60573049119   -74.0485050712   -129.1321614978
## 119   0.1983659785    0.04480684805    -0.2160360288     -0.3708156704
## 124  61.7488020195   19.36822787634   -67.4004921294   -117.1602819876
## 146   4.5063398201    1.95641601319    -5.0723946134     -8.9955389155
## 121   1.8246345426    1.02425069492    -2.1044730385     -3.8031881596
## 139  46.4630559728   23.84452286192   -52.9453080689    -95.7547071736
## 128  45.0496214103   20.11533697263   -50.4845790856    -89.9048344986
## 140  18.0359833966    7.58615168002   -20.0966544411    -35.5362505944
## 138  16.2756001081    8.11357497632   -18.4434275213    -33.0156325169
## 113   7.7056444674    3.31122462317    -8.6421599732    -15.3112233341
## 112  11.0094828168    3.91979208797   -12.2087496032    -21.3888652946
## 135  29.7306210480   10.61297516647   -32.8707285427    -57.5736815091
## 145   0.3588943952    0.25534259654    -0.4277326662     -0.7894144732
## 142  14.9628967751    6.07265021055   -16.6411377136    -29.3614120638
## 115   0.1790666961    0.09930262273    -0.2097764918     -0.3792972692
## 125   4.0526398799    2.50031127568    -4.7098261459     -8.5767722843
##                 [,5]             [,6]              [,7]
## 3     0.00023264244301  -0.00008952868656   -0.00023756543200
## 43    0.00038202799506  -0.00015601649273   -0.00038840418009
## 7     0.00049290445440  -0.00023697050884   -0.00049578967193
```

```
## 13    0.00016181095467   -0.00004152609011    -0.00016870544752
## 47    0.00034284889793   -0.00022908628431    -0.00033477764282
## 6     0.00043843247928   -0.00028787390242    -0.00042967771977
## 26    0.00020906705128   -0.00004427282025    -0.00022016720359
## 49    0.00019069011875   -0.00011862197737    -0.00018767690745
## 16    0.00035875602658   -0.00030231729522    -0.00034158427089
## 4     0.00035800822408   -0.00011708450369    -0.00036943565720
## 35    0.00021928824094   -0.00006504054253    -0.00022752481206
## 15    0.00008205389265   -0.00006083770966    -0.00007929964969
## 14    0.00021796280786   -0.00006861141535    -0.00022460767774
## 11    0.00016344008129   -0.00010085544438    -0.00016102535384
## 41    0.00023290912261   -0.00012085750740    -0.00023295252939
## 23    0.00024054509147   -0.00014857641981    -0.00023619000936
## 46    0.00026751650935   -0.00005722354992    -0.00028158182496
## 2     0.00017732903102   -0.00003939820731    -0.00018618394284
## 12    0.00038029702810   -0.00018558423479    -0.00038223369715
## 19    0.00019159562711   -0.00012026423848    -0.00018879180055
## 50    0.00018288256038   -0.00007682592023    -0.00018583148531
## 22    0.00042273418497   -0.00024730586305    -0.00041874396660
## 17    0.00023074026377   -0.00015636855433    -0.00022527005599
## 37    0.00008866217174   -0.0000440128 0263    -0.00008900439344
## 24    0.00055739079885   -0.00018699026538    -0.00057679174197
## 79    6.78201445162406    1.62228479843517    -7.67745817387377
## 74    2.85399707352324    1.18548603315770    -3.39596007320133
## 52    2.35720489363571    0.97092990019587    -2.79940947927712
## 99   -6.38889914566740   -9.01435835458820     8.88152690799594
## 75    0.56307164837870    0.14639167646395    -0.65404621468835
## 97    2.66932068414887    1.08746962187712    -3.16703082583464
## 95    4.08059889704403    1.69858745420084    -4.84773004279800
## 87    2.28533748245451    0.93665268315925    -2.71896160112322
## 83    0.57300378238465    0.17772754401114    -0.67056170146673
## 81    0.77129429102932    0.32784700989464    -0.91934542918301
## 90    3.37181975553731   -2.30975012670075    -2.93532800784799
## 77    1.60154229016488   -1.73942011248681    -1.21500103828749
## 89    2.29443095421450    0.90927494545436    -2.71364506042723
## 93    0.92303616004095    0.37172065947997    -1.09731989129714
## 57    6.09907357216567    3.17659288429106    -7.34716877296047
## 69   23.15672253018742    7.27477374440715   -25.53563163398185
## 96    1.43768286496267    0.51098845764072    -1.68964040401697
## 68   -0.15777272327321   -0.60337858320862     0.29613326433188
## 91    5.67321560865463    1.97254470562717    -6.61826004319313
## 59    0.92650792682415    0.34992884571880    -1.09839228321183
## 56    6.03929954666945    2.71047733721915    -7.20734831894594
## 100   2.24188852537727    0.89977804152643    -2.66018007664890
## 78   33.68350694198468   23.94812515873589   -40.78335285522041
## 72    0.54705664519192    0.15669860812945    -0.63804704458961
## 61    0.76027621694187    0.14604335699237    -0.84475666017542
## 105   0.27836042328871    0.17114988983852    -0.32992535438116
## 111  12.46139426219093    6.24285763731545   -14.21890673181973
## 134  40.25958232469405   18.85833711116679   -45.85652892922760
## 149   0.47456735933624    0.40889766223166    -0.58599993939342
## 132  31.33668564847265  408.38418658038233  -147.86132116726424
## 107   2.00867210767514    0.99343098201717    -2.34829243312230
## 126  16.31046120701951    7.45998243040742   -18.37746148429645
```

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```
## 123  1.25559079890819    0.43325075475007   -1.40090614305222
## 137  0.19409891825566    0.17394703646626   -0.24116246943231
## 127 26.21756573616158    9.38594998356023  -29.08960143083767
## 119  0.10100149490869    0.02388964076224   -0.11132874108842
## 124 24.01299888396747    8.07689939727098  -26.56515201888978
## 146  2.04509931588630    0.95958060783979   -2.34465840482906
## 121  0.87620052045209    0.52844139657560   -1.02980230375230
## 139 18.66976946230624    9.83175478314788  -21.51447232689516
## 128 18.11772450662214    8.54701760358266  -20.59867505627722
## 140  7.52642574107663    3.42580946917752   -8.53588063523261
## 138  7.04821930475260    3.80261432154467   -8.14196760819457
## 113  3.38909394094763    1.57706258973287   -3.87180327026476
## 112  4.77558907144732    1.84166294471093   -5.38793749583428
## 135 12.29883257771018    4.75049653049390  -13.82346093860053
## 145  0.18956956896245    0.14197855104461   -0.22933957886125
## 142  6.28284335655102    2.75993974375012   -7.11149548652483
## 115  0.09846031594083    0.05669908225690   -0.11655056465216
## 125  1.90554034388877    1.26810625430726   -2.25994919090896
##                  [,8]              [,9]             [,10]
## 3      -0.0003662848051  -0.0005202326589   0.00020020265138
## 43     -0.0005957504388  -0.0008542880967   0.00034888126742
## 7      -0.0007487297131  -0.0011022290010   0.00052990966805
## 13     -0.0002670667849  -0.0003618400142   0.00009285986541
## 47     -0.0004840034799  -0.0007666746304   0.00051227984495
## 6      -0.0006233611730  -0.0009804176525   0.00064373994602
## 26     -0.0003518496052  -0.0004675141759   0.00009900156819
## 49     -0.0002744242415  -0.0004264189237   0.00026526095953
## 16     -0.0004727645463  -0.0008022457864   0.00067603814809
## 4      -0.0005767047633  -0.0008005761643   0.00026182139785
## 35     -0.0003574404492  -0.0004903703798   0.00014544237462
## 15     -0.0001126311786  -0.0001834878882   0.00013604452149
## 14     -0.0003512023408  -0.0004874063802   0.00015342759461
## 11     -0.0002357538037  -0.0003654827095   0.00022553166548
## 41     -0.0003488507607  -0.0005208286976   0.00027025995847
## 23     -0.0003453622229  -0.0005379040509   0.00033224469714
## 46     -0.0004497942079  -0.0005982192799   0.00012796101833
## 2      -0.0002968473283  -0.0003965415634   0.00008810134941
## 12     -0.0005763812734  -0.0008504165184   0.00041500074871
## 19     -0.0002758816731  -0.0004284438086   0.00026893336339
## 50     -0.0002844261237  -0.0004089599134   0.00017179705065
## 22     -0.0006177869899  -0.0009453135800   0.00055302210290
## 17     -0.0003250841463  -0.0005159785630   0.00034966938619
## 37     -0.0001339651950  -0.0001982652557   0.00009842086720
## 24     -0.0008998042172  -0.0012464391153   0.00041814026673
## 79    -13.0222822965385 -15.1657439724560  -3.62729734242531
## 74     -6.0425583916914  -6.3821451295576  -2.65109428982450
## 52     -4.9786689021346  -5.2732458250387  -2.17415440247078
## 99     17.7241605944808  -0.3449251699555  -0.10817244813991
## 75     -1.1378372178295  -1.3881720820806  -0.50797738556147
## 97     -5.6287251918198  -5.9695422823824  -2.43242303714258
## 95     -8.6179768787589  -9.1249646434397  -3.79836219182448
## 87     -4.8345674871091  -5.1110418862815  -2.09544763011950
## 83     -1.1753042364324  -1.3635613467383  -0.51255748269953
## 81     -1.6370488705709  -1.7280227455583  -0.73928672356456
```

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```
## 90     -3.4325592530711    -7.5397044655420     5.17136025113731
## 77     -1.0062142080097    -3.5799018344459     3.93269947788893
## 89     -4.8145877286113    -5.1335519703104    -2.03718483502670
## 93     -1.9491811742605    -2.0688823112061    -0.83854678912962
## 57    -13.2616976776700   -13.6386180299711    -7.10345408957700
## 69    -44.4496446166507   -43.2731517727265   -14.04851398684824
## 96     -2.9802059859368    -3.2446005836436    -1.18325086957802
## 68      0.6892713933128    -0.8423054211206    -0.29074593513338
## 91    -11.5650799625125   -12.6863123800345    -4.41087429962779
## 59     -1.9445636769920    -2.0865430851155    -0.80387315899083
## 56    -12.8758897018095   -13.5049458834067    -6.06111413195996
## 100    -4.7243234670627    -5.0137199973164    -2.01270303761030
## 78    -77.4064676219403   -62.2528702033663   -43.28052464661938
## 72     -1.1144078337349    -1.3268888018184    -0.49590434650940
## 61     -1.4073749225570    -1.6848021657989     0.03183210513702
## 105    -0.6015754542587                 NaN                  NaN
## 111   -25.4813997585670                 NaN                  NaN
## 134   -82.6824176599967   -74.2686788253333   -34.85696215584099
## 149    -1.1027821404526                 NaN                  NaN
## 132  -451.4384637352418   -57.4278836977411  -706.52001799078687
## 107    -4.2133364723802                 NaN                  NaN
## 126   -32.6961771662280                 NaN                  NaN
## 123    -2.4524633683940                 NaN                  NaN
## 137    -0.4557355828452                 NaN                  NaN
## 127   -50.9803076717834   -49.4412428199361   -18.30071682017224
## 119    -0.1917053603862                 NaN                  NaN
## 124   -46.4017808793911   -45.3616163862941   -15.77989969023018
## 146    -4.1852148641266                 NaN                  NaN
## 121    -1.8737556822956                 NaN                  NaN
## 139   -38.9573220621820   -35.8441416171539   -19.10841722161427
## 128   -36.8380337257116   -34.7990178448511   -16.84008593543575
## 140   -15.1918824406789                 NaN                  NaN
## 138   -14.6776838841703                 NaN                  NaN
## 113    -6.9052289908013                 NaN                  NaN
## 112    -9.4962831384181                 NaN                  NaN
## 135   -24.3553979927522                 NaN                  NaN
## 145    -0.4255495842258                 NaN                  NaN
## 142   -12.6278236672146                 NaN                  NaN
## 115    -0.2114785862430                 NaN                  NaN
## 125    -4.1464288392224                 NaN                  NaN
##               [,11]             [,12]
## 3     0.0005312414780   0.0008190826344
## 43    0.0008685467408   0.0013322135558
## 7     0.0011086812059   0.0016743044973
## 13    0.0003772574712   0.0005972122493
## 47    0.0007486258139   0.0010823229321
## 6     0.0009608404155   0.0013939532661
## 26    0.0004923364266   0.0007868040542
## 49    0.0004196808277   0.0006136641875
## 16    0.0007638465260   0.0010571902534
## 4     0.0008261305340   0.0012896256666
## 35    0.0005087890459   0.0007993055186
## 15    0.0001773288853   0.0002518644348
## 14    0.0005022656785   0.0007853557326
```

```
## 11     0.0003600829331    0.0005271897973
## 41     0.0005209257974    0.0007800961751
## 23     0.0005281652863    0.0007722949289
## 46     0.0006296724372    0.0010058291375
## 2      0.0004163429356    0.0006638076341
## 12     0.0008547474270    0.0012888987347
## 19     0.0004221739362    0.0006169232754
## 50     0.0004155543003    0.0006360306026
## 22     0.0009363907881    0.0013814888684
## 17     0.0005037461620    0.0007269492415
## 37     0.0001990305311    0.0002995713301
## 24     0.0012898249326    0.0020121499040
## 79    17.1679994311467   29.1196561977952
## 74     7.5941107741048   13.5125147145987
## 52     6.2629193195269   11.1390590771813
## 99     0.4032117798518    0.7069416906866
## 75     1.6421812840864    2.9025018100367
## 97     7.0826914331024   12.5881195295267
## 95    10.8404143282882   19.2713816894864
## 87     6.0809617621817   10.8127301277354
## 83     1.6138290481485    2.8561356698991
## 81     2.0608146211770    3.6713244176613
## 90     6.5618046936421    7.6690633899860
## 77     2.7031161071239    2.2050513871767
## 89     6.0720615158491   10.7739790066435
## 93     2.4606506409668    4.3725901204735
## 57    16.4295928195470   29.6555531750167
## 69    48.0164392525606   83.7686001418938
## 96     3.8192628580558    6.7456122373664
## 68     0.9915126082722    1.7468790621365
## 91    14.7995788587868   25.8614852133620
## 59     2.4768863834149    4.3899145741786
## 56    16.1169162401078   28.7927870760000
## 100    5.9492730839481   10.5656978161227
## 78    75.3085069273310  142.4095623424390
## 72     1.5710224269291    2.7797267130872
## 61     1.7705956224409    2.7674665674923
## 105              NaN                NaN
## 111              NaN                NaN
## 134   84.8672465381710  152.9740322731249
## 149              NaN                NaN
## 132  259.0755878105109  785.9448209705475
## 107              NaN                NaN
## 126              NaN                NaN
## 123              NaN                NaN
## 137              NaN                NaN
## 127   55.2328068497560   97.0354480691131
## 119              NaN                NaN
## 124   50.5223231473517   88.4603229768552
## 146              NaN                NaN
## 121              NaN                NaN
## 139   41.5283128877354   75.2406054700118
## 128   39.8377565099229   71.3863257962495
## 140              NaN                NaN
```

```
## 138              NaN              NaN
## 113              NaN              NaN
## 112              NaN              NaN
## 135              NaN              NaN
## 145              NaN              NaN
## 142              NaN              NaN
## 115              NaN              NaN
## 125              NaN              NaN
##
## $generalized.weights[[2]]
##              [,1]           [,2]           [,3]           [,4]
## 3             NaN            NaN            NaN            NaN
## 43            NaN            NaN            NaN            NaN
## 7    0.031005510285 0.028953585924 -0.048186196487 -0.12991556220
## 13            NaN            NaN            NaN            NaN
## 47            NaN            NaN            NaN            NaN
## 6             NaN            NaN            NaN            NaN
## 26            NaN            NaN            NaN            NaN
## 49            NaN            NaN            NaN            NaN
## 16            NaN            NaN            NaN            NaN
## 4             NaN            NaN            NaN            NaN
## 35            NaN            NaN            NaN            NaN
## 15            NaN            NaN            NaN            NaN
## 14            NaN            NaN            NaN            NaN
## 11            NaN            NaN            NaN            NaN
## 41            NaN            NaN            NaN            NaN
## 23            NaN            NaN            NaN            NaN
## 46            NaN            NaN            NaN            NaN
## 2             NaN            NaN            NaN            NaN
## 12            NaN            NaN            NaN            NaN
## 19            NaN            NaN            NaN            NaN
## 50            NaN            NaN            NaN            NaN
## 22            NaN            NaN            NaN            NaN
## 17            NaN            NaN            NaN            NaN
## 37            NaN            NaN            NaN            NaN
## 24            NaN            NaN            NaN            NaN
## 79   0.157807956396 0.244981970109 -0.313676175909 -0.45670648528
## 74   0.092654006365 0.193832069204 -0.199179718200 -0.32282595196
## 52   0.048725745686 0.090870281808 -0.100071755751 -0.18177127791
## 99   0.003623507703 0.006887560534 -0.007456729288 -0.01408994219
## 75   0.023271852721 0.045277446404 -0.048547460757 -0.08550596800
## 97   0.045199120538 0.091597988369 -0.095519825341 -0.16773558511
## 95   0.089864417075 0.171237440141 -0.187905219489 -0.29916043391
## 87   0.073374786980 0.130100409624 -0.149665550747 -0.24865746194
## 83   0.017490478373 0.035061806393 -0.036833533210 -0.06474112842
## 81   0.029112488216 0.058398516546 -0.061812383407 -0.09903557428
## 90   0.096583637007 0.147099574603 -0.191525538258 -0.26933756928
## 77   0.110460702142 0.143673654751 -0.211844690457 -0.27805447737
## 89   0.029149087845 0.057743186811 -0.060897609319 -0.11214577781
## 93   0.031711357839 0.062594332132 -0.066825719990 -0.11031205230
## 57   0.110999580483 0.207518387594 -0.228953515040 -0.39982721362
## 69   0.238651022780 0.395551717532 -0.482758960628 -0.70270034101
## 96   0.020262259965 0.040920288932 -0.042583587909 -0.07849865766
## 68   0.011267097571 0.024402000367 -0.024328975430 -0.04268939866
```

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```
## 91   0.145066860067 0.280162995192 -0.305537994595 -0.46771878901
## 59   0.042778058985 0.083712438213 -0.089807031860 -0.15018176521
## 56   0.134872054006 0.267908976101 -0.285633023869 -0.45482779789
## 100  0.045017061079 0.089327124757 -0.094702420854 -0.16251485354
## 78   0.253011772329 0.138241378783 -0.430650610745 -0.37976979253
## 72   0.019397555861 0.036893321402 -0.040173858549 -0.07101014044
## 61   0.046084355019 0.073380773053 -0.092737263797 -0.12499992003
## 105  0.033641925792 0.072047023054 -0.072184029333 -0.13039433531
## 111  0.264932785246 0.186951964515 -0.466508476535 -0.39218894828
## 134  0.292780521716 0.187652259739 -0.506971149984 -0.46405361491
## 149  0.109218950180 0.218607723969 -0.235660025341 -0.30139830875
## 132  0.209704597994 0.142572378380 -0.367981485929 -0.29836584106
## 107  0.186972631329 0.242135760537 -0.360208097863 -0.43487690742
## 126  0.199952473808 0.142911422559 -0.352200664359 -0.30566257716
## 123  0.018981427791 0.033857533718 -0.038104936622 -0.07653176686
## 137  0.063512969981 0.153499949916 -0.142914100476 -0.24055852912
## 127  0.280212201324 0.299313040179 -0.521943612697 -0.56095626227
## 119  0.013743931604 0.011345918021 -0.022471081420 -0.06177750293
## 124  0.267826684740 0.432128245198 -0.541540406048 -0.71693538834
## 146  0.111108513269 0.279581846625 -0.255500885627 -0.39423656837
## 121  0.072520349750 0.175865717338 -0.164242660027 -0.25962406754
## 139  0.282950500554 0.138243886220 -0.478536531526 -0.37407964755
## 128  0.281781261250 0.142017163995 -0.478188330389 -0.37149823511
## 140  0.194172622004 0.399812639755 -0.420381340378 -0.58250290660
## 138  0.202277795028 0.117338318743 -0.348735393406 -0.26845902208
## 113  0.121755571696 0.279415383177 -0.271612125258 -0.40749464514
## 112  0.126221115330 0.270934356543 -0.274461846662 -0.42847934856
## 135  0.175865578060 0.066268547858 -0.287896580438 -0.27571892916
## 145  0.046420010748 0.095174447849 -0.097576834928 -0.18868638283
## 142  0.193310163847 0.469988194483 -0.440335358113 -0.65471323617
## 115  0.029772637388 0.052700765964 -0.059504437814 -0.12212793816
## 125  0.132413404374 0.213592750191 -0.269992301548 -0.31395178474
##              [,5]          [,6]          [,7]          [,8]
## 3     1.8747386835   1.7542373174  -2.8690395366  -7.7606281912
## 43    2.1043910337   2.0696259690  -3.3330764774  -8.8138508389
## 7     2.2649273653   2.1150359559  -3.5199625502  -9.4902263918
## 13    1.8897338568   0.4210253877  -1.2019761549  -6.0816085657
## 47    1.5066172963   1.5055428432  -2.5111752746  -6.5334997278
## 6     1.9514989802   1.6781551046  -2.9467538412  -8.1826337223
## 26    3.2785321997 -13.1483364088  14.2909887027   5.2907525481
## 49    1.3609751935   1.3603599283  -2.2634969842  -5.8914894519
## 16    1.2388075726   1.2324335080  -2.1055096152  -5.4614835068
## 4     2.5533127412  -0.5642341201  -0.3238358812  -6.9983463348
## 35    2.3284884170  -1.3893963313   0.7283316092  -5.4010143098
## 15    0.8296007747   0.8374680619  -1.4151144324  -3.6526065269
## 14    1.7517990646   1.9136607838  -2.9538278117  -7.4618127538
## 11    1.3106457652   1.3030398742  -2.1720930311  -5.6667826371
## 41    1.7191072530   1.7359369494  -2.8620731938  -7.4257781594
## 23    1.3273447909   1.3777777008  -2.2787223093  -5.8263284404
## 46    2.9173261344  -3.2748140395   2.7443670750  -4.9717618479
## 2     2.2562815401  -1.0299179666   0.3575712964  -5.5437005014
## 12    2.0717962102   1.2448655899  -2.3729278284  -7.8268752187
## 19    1.5366775362   1.1861377769  -2.1471853871  -6.2614089681
## 50    1.7167585302   1.4457504797  -2.4572409249  -6.9628688635
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## 22    2.0743919635    1.9374027141   -3.2938789470   -8.8334047519
## 17    1.4786712178    1.4937017138   -2.5143142508   -6.4929564031
## 37    1.2004077370    1.2137718760   -2.0011342898   -5.1885280288
## 24    5.0359084153  -24.7391098889   27.1196441672   12.9229289383
## 79   11.5277382573   17.8957180657  -22.9137789100  -33.3619955461
## 74    6.7682994901   14.1592747884  -14.5499159656  -23.5821708836
## 52    3.5593748292    6.6379989732   -7.3101583118  -13.2782370971
## 99    0.2646942697    0.5031306883   -0.5447079802   -1.0292587086
## 75    1.6999897142    3.3074804730   -3.5463522137   -6.2461402501
## 97    3.3017585275    6.6911582617   -6.9776448530  -12.2529454677
## 95    6.5645218763   12.5087545111  -13.7263221958  -21.8534210992
## 87    5.3599669374    9.5037262922  -10.9329438381  -18.1642146291
## 83    1.2776651197    2.5612363882   -2.6906594985   -4.7292861882
## 81    2.1266435320    4.2659640849   -4.5153442579   -7.2344676470
## 90    7.0553552195   10.7455006071  -13.9907825571  -19.6748808356
## 77    8.0690626413   10.4952344480  -15.4750773153  -20.3116325733
## 89    2.1293167536    4.2180926319   -4.4485202294   -8.1921557999
## 93    2.3164887644    4.5724649075   -4.8815642833   -8.0582047268
## 57    8.1084242071   15.1590435222  -16.7248597850  -29.2070243039
## 69   17.4319888194   28.8908471385  -35.2623272413  -51.3208753782
## 96    1.4801414133    2.9891937660   -3.1106961830   -5.7342621108
## 68    0.8230522880    1.7825463017   -1.7772118432   -3.1184257009
## 91   10.5970155961   20.4656778315  -22.3193010160  -34.1664721764
## 59    3.1249021220    6.1151251917   -6.5603301569  -10.9706538357
## 56    9.8522928008   19.5705312652  -20.8652582842  -33.2247930878
## 100   3.2884592913    6.5252734482   -6.9179341802  -11.8715754039
## 78   18.4821695866   10.0971434386  -31.4581297513  -27.7395854279
## 72    1.4169755041    2.6950269601   -2.9346674142   -5.1872319674
## 61    3.3664246257    5.3604054946   -6.7743815934   -9.1311416419
## 105   2.0359479108    5.0772024124   -4.6695021892   -7.1474983948
## 111  19.3451777692   13.5770056078  -34.0446680252  -28.5057710634
## 134  21.3873184766   13.7072920601  -37.0335905343  -33.8977337273
## 149   7.7014173159   14.5333733721  -16.4516654324  -18.5236275698
## 132  15.3178155388   10.4050792412  -26.8767230229  -21.7780323009
## 107  13.6449089020   17.6140344461  -26.2740462096  -31.6082278576
## 126  14.6015159948   10.3927127235  -25.7080861999  -22.2435773436
## 123   1.1463604990    2.3405874276   -2.4189616348   -4.4316418072
## 137   3.9720971748   10.0357622459   -9.2695979226  -11.9425170862
## 127  20.4644988324   21.8308072808  -38.1115201047  -40.9104065692
## 119   0.1806608511    0.3307173148   -0.3658440735   -0.7264989792
## 124  19.5527998929   31.5197160296  -39.5300786391  -52.2543971834
## 146   7.8054101067   20.3234370825  -18.2347331968  -27.0037408806
## 121   4.8908458842   12.5892286021  -11.4025296241  -16.3989601463
## 139  20.6685630571   10.0906889080  -34.9534437899  -27.3123436888
## 128  20.5828472142   10.3629992818  -34.9266501096  -27.1179457736
## 140  14.0932433635   28.9690815165  -30.5218795906  -41.7769671638
## 138  14.7727771390    8.5337349619  -25.4594320671  -19.5443684246
## 113   8.7500850018   20.2257583630  -19.5997745709  -28.7941066633
## 112   9.1559447267   19.7055557418  -19.9391135284  -30.8847068767
## 135  12.8458235551    4.8320205811  -21.0266931443  -20.1251741725
## 145   2.4800870827    7.0680775883   -6.0247374361   -8.4009580427
## 142  13.8947263364   34.1256899132  -31.8138401094  -46.3630778732
## 115   1.4566360744    3.9655655428   -3.4572222335   -5.1858832612
## 125   9.5851599547   15.0899030697  -19.4620482823  -21.7961370265
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##             [,9]         [,10]          [,11]          [,12]
## 3    -1.9404324750  -1.8157085516    2.9695751935    8.0325728066
## 43   -2.1781322047  -2.1421489174    3.4498727184    9.1227020320
## 7    -2.3442939818  -2.1891501416    3.6433075731    9.8227788480
## 13   -1.9559531028  -0.4357787794    1.2440952894    6.2947176932
## 47   -1.5594115355  -1.5582994319    2.5991708051    6.7624438321
## 6    -2.0198825732  -1.7369602983    3.0500127296    8.4693660751
## 26   -3.3934171235  13.6090747923  -14.7917674193   -5.4761488370
## 49   -1.4086659044  -1.4080290794    2.3428134779    6.0979365066
## 16   -1.2822173380  -1.2756199161    2.1792899830    5.6528624770
## 4    -2.6427848348   0.5840057709    0.3351835997    7.2435793953
## 35   -2.4100823127   1.4380829635   -0.7538534941    5.5902743443
## 15   -0.8586712903  -0.8668142597    1.4647022674    3.7805996033
## 14   -1.8131848586  -1.9807184668    3.0573345831    7.7232864064
## 11   -1.3565728538  -1.3487004404    2.2482065865    5.8653556117
## 41   -1.7793474744  -1.7967669099    2.9623647391    7.6859891031
## 23   -1.3738570396  -1.4260571980    2.3585723223    6.0304921508
## 46   -3.0195538296   3.3895686731   -2.8405340128    5.1459802011
## 2    -2.3353451932   1.0660079117   -0.3701011569    5.7379604844
## 12   -2.1443952073  -1.2884876377    2.4560789509    8.1011412341
## 19   -1.5905251335  -1.2277019098    2.2224261395    6.4808185844
## 50   -1.7769164487  -1.4964118499    2.5433465109    7.2068587376
## 22   -2.1470819199  -2.0052923518    3.4093016449    9.1429411449
## 17   -1.5304861825  -1.5460433707    2.6024197759    6.7204798056
## 37   -1.2424719118  -1.2563043512    2.0712571821    5.3703422099
## 24   -5.2123745651  25.6060072016  -28.0699591443  -13.3757686896
## 79  -11.9316884150 -18.5228124360   23.7167139420   34.5310530438
## 74   -7.0054713555 -14.6554380520   15.0597679144   24.4085272833
## 52   -3.6841009429  -6.8706049184    7.5663177917   13.7435275262
## 99   -0.2739695736  -0.5207611791    0.5637954051    1.0653255545
## 75   -1.7595600311  -3.4233797938    3.6706219785    6.4650148486
## 97   -3.4174573475  -6.9256269766    7.2221525156   12.6823079932
## 95   -6.7945530600 -12.9470809648   14.2073141369   22.6191994365
## 87   -5.5477886359  -9.8367518572   11.3160514356   18.8007174599
## 83   -1.3224365168  -2.6509861407    2.7849444419    4.8950078248
## 81   -2.2011644673  -4.4154501773    4.6735690242    7.4879747810
## 90   -7.3025859791 -11.1220399116   14.4810416216   20.3643197665
## 77   -8.3518153185 -10.8630041246   16.0173484494   21.0233844758
## 89   -2.2039313686  -4.3659012357    4.6044033854    8.4792218591
## 93   -2.3976621766  -4.7326912723    5.0526219776    8.3405769116
## 57   -8.3925562265 -15.6902403499   17.3109253170   30.2304848516
## 69  -18.0428544370 -29.9032928204   36.4980218488   53.1194204042
## 96   -1.5320078999  -3.0939398182    3.2196998748    5.9351996912
## 68   -0.8518933352  -1.8450095276    1.8394881420    3.2277002450
## 91  -10.9683516999 -21.1828273919   23.1014044465   35.3637191852
## 59   -3.2344036125  -6.3294088026    6.7902144524   11.3550828349
## 56  -10.1975326549 -20.2563134893   21.5964097837   34.3890422248
## 100  -3.4036920841  -6.7539292996    7.1603494858   12.2875741203
## 78  -19.1298161307 -10.4509845797   32.5604812481   28.7116624136
## 72   -1.4666285575  -2.7894649465    3.0375027810    5.3690007520
## 61   -3.4843894401  -5.5482425395    7.0117665817    9.4511112217
## 105  -2.1143407393  -5.2582223314    4.8432211272    7.4377210743
## 111 -20.0231961221 -14.0540978108   35.2382052472   29.5070547831
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## 149  -7.9759184209 -15.0666560412  17.0409193697  19.2311437890
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## 107 -14.1232702210 -18.2324918649  27.1953800239  32.7184918406
## 126 -15.1132571835 -10.7576732199  26.6092705351  23.0244458427
## 123  -1.1905480085  -2.4248241086   2.5098227301   4.6063148693
## 137  -4.1224480900 -10.4071192546   9.6139882018  12.4551554914
## 127 -21.1816869071 -22.5963578003  39.4472758955  42.3450918958
## 119  -0.2007601807  -0.3506359399   0.3999969449   0.8152761501
## 124 -20.2381567801 -32.6250007951  40.9157598752  54.0874325878
## 146  -8.0841245157 -21.0372710964  18.8808879061  27.9800114734
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## 112  -9.4778604991 -20.3975072595  20.6396526868  31.9739018048
## 135 -13.2959783734  -5.0014900660  21.7635670656  20.8306573191
## 145  -2.5822257972  -7.3138198976   6.2543024059   8.7853529641
## 142 -14.3854059644 -35.3249622268  32.9345387312  48.0121824833
## 115  -1.5196901062  -4.1025883433   3.5932446188   5.4300741566
## 125  -9.9225028550 -15.6272539636  20.1483883328  22.5789355149
##
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## 43  -4.19025461992  2.476028583064   4.5150267287  10.1329671679
## 7   -4.24026481043  2.438809228693   4.5565815718  10.2577701684
## 13  -3.88205932370  2.530813558783   4.1599050238   9.0310890489
## 47  -3.93136032474  2.716252136740   4.2201391241   9.0170771572
## 6   -4.08153657043  2.591082968508   4.3590129924   9.5050232035
## 26  -4.12726937539  2.544637940165   4.3884862444   9.6576472314
## 49  -3.88020508507  2.748133529871   4.1542345129   8.6897868991
## 16  -3.89948292914  2.794870991953   4.1533008748   8.6385160618
## 4   -4.24745466945  2.466986323282   4.5597076553  10.2318692522
## 35  -4.10563979039  2.544271282074   4.3904329198   9.6251917850
## 15  -3.54484228031  2.735871522802   3.7795795277   7.4760107364
## 14  -3.97176206368  2.504329662021   4.2812753299   9.4674408302
## 11  -3.84431038740  2.749668592477   4.1127228245   8.5415502005
## 41  -4.07630266764  2.636208052808   4.3602811441   9.4223692433
## 23  -3.92119209214  2.706453363541   4.2067990474   9.0040305064
## 46  -4.32962832449  2.464519613719   4.6078334472  10.3038763827
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## 12  -4.11060209891  2.555001315662   4.4226521529   9.7736267975
## 19  -3.95889230275  2.749806662033   4.2257504777   8.8390985796
## 50  -3.97462245824  2.613881936969   4.2579212865   9.1489271052
## 22  -4.17256583113  2.539592839820   4.4594138135   9.8501572801
## 17  -4.02818630788  2.731998917178   4.2920848124   9.1080156729
## 37  -3.64680633376  2.624355153727   3.8935322295   8.0020971779
## 24  -4.55102826775  2.281788308796   4.8285476103  11.0953105487
## 79   8.01021697955 19.334414013147 -18.6464398653 -21.3453224918
## 74   3.50714452989  8.234017503261  -8.0642431278  -9.3144763754
## 52  -0.57188736947  4.061553586374  -1.7921865375  -0.9406449387
## 99  -2.24392657817 77.723170663682 -41.3752377528 -34.3060733893
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## 75   -0.16557588948  1.254716689172  -0.5557694236  -0.2903330378
## 97   -0.50710812626  3.424301125644  -1.4911475324  -0.7036978847
## 95    1.74229284664  6.539005576201  -5.4047359289  -5.8526088528
## 87    0.22355310802  2.078215091410  -1.4069930822  -1.3363009824
## 83   -0.27852719756  2.608025649163  -1.2162471771  -0.7558937028
## 81   -0.02657597706  0.795732105884  -0.4304408517  -0.3118725502
## 90    3.11606082131  8.195343814062  -7.6758811486  -8.7435861642
## 77    2.90610229283  4.776636424120  -5.5522236318  -6.7116358509
## 89   -1.31535222578 14.234992399478  -6.9065054102  -4.6565162469
## 93   -0.08595085187  0.929227193588  -0.4500682212  -0.2684721387
## 57   -0.23973340146  5.603425955670  -3.0133754166  -2.1963243700
## 69   26.50022868259  9.374198236333 -31.0412422488 -39.3531167681
## 96   -0.98441667074 12.062390758093  -5.9554354029  -4.1624091495
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## 59    0.09654160903  0.989260897128  -0.6603582575  -0.6191535887
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## 78   26.55735015718 26.401304427447 -40.2581504819 -48.3706324186
## 72   -0.26022316096  2.413723521066  -1.1223570790  -0.6931691492
## 61    0.90801690552  2.424919274436  -2.2708474843  -2.5848068103
## 105  -1.63840962990 -0.903573955428   1.8819884097   5.2147298875
## 111  17.28562851561 14.678578930090 -24.6015624708 -27.0492022308
## 134  31.61327036725 19.756746635960 -41.2929956654 -49.5568856792
## 149  -1.40113727337 -0.006444844954   1.1152952165   4.2569700138
## 132  21.00840082403 13.071644499384 -26.9218258150 -30.6159385251
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## 126  12.81870848456  4.511098566449 -14.6348568332 -16.2385669246
## 123   0.03640028800 -0.510046463489   0.1075840597   2.7512396897
## 137  -1.70978876840 -0.660151912564   1.7753083512   5.0591485223
## 127  23.98993247997 14.729863989608 -31.1355103377 -36.1477708901
## 119  -1.61714684103 -0.970154946977   1.9418928261   5.6050739063
## 124  20.54528143644  8.741190406237 -24.5153791573 -28.4635855123
## 146   3.03766373187  0.915809559909  -3.5115559402  -1.7996440042
## 121  -0.26150518688 -0.360784066837   0.2776629231   2.9880560768
## 139  22.37670545985 23.252890055684 -34.3424511521 -38.6332056084
## 128  20.05496644565 17.893030613258 -29.1096040743 -32.7065692405
## 140  10.09003617624  4.035311693848 -11.8423143131 -12.2604515988
## 138   5.25289195657  2.749631487339  -6.5837514414  -5.9541411882
## 113   3.85007227400  1.036126009545  -4.3255517674  -2.9808706714
## 112   4.08307144612  0.917030899639  -4.4920350011  -3.3925358230
## 135   4.95902757257  1.216016802946  -5.4684818702  -5.4131784089
## 145  -1.73504072312 -0.939887293644   1.9545193352   5.2603614924
## 142  12.08310597497  5.513534873761 -14.5463413426 -15.3752487467
## 115  -1.61385738584 -0.870548395096   1.8649187265   5.2222471395
## 125   0.82114952973  0.480654419773  -1.1874500453   1.0626997053
##                [,5]            [,6]            [,7]             [,8]
## 3       2.6602547435  -1.65232007409  -2.854938001467  -6.25632259794
## 43      2.7428402505  -1.59858325992  -2.955155412012  -6.63548909276
## 7       2.7783004912  -1.57635775543  -2.985248705556  -6.72590766673
## 13      2.5322814955  -1.63290362883  -2.713343590339  -5.89475085090
## 47      2.5676143151  -1.75875616230  -2.755997729205  -5.89624728677
## 6       2.6706035560  -1.67919292572  -2.851839035641  -6.22901932674
## 26      2.6959392189  -1.64213733980  -2.866385305853  -6.31259526662
```

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## 49    2.5288802589  -1.77792230067   -2.707260969040   -5.67118640885
## 16    2.5452649200  -1.81332434058   -2.710631294643   -5.64926013121
## 4     2.7804895338  -1.59201623600   -2.984659090902   -6.70004875554
## 35    2.6816880555  -1.64241832525   -2.867490073229   -6.29157330630
## 15    2.3018760222  -1.76917202363   -2.454107006932   -4.86218923298
## 14    2.5938740021  -1.61548555056   -2.795793951010   -6.18549895752
## 11    2.5040430305  -1.77865427981   -2.678664344824   -5.57147654719
## 41    2.6611359028  -1.70478042971   -2.846248009038   -6.15955426464
## 23    2.5579176421  -1.75060912251   -2.743995777380   -5.88104742065
## 46    2.8317955648  -1.59026165479   -3.013519068436   -6.74420883135
## 2     2.6401994889  -1.62528184525   -2.816727269337   -6.16358947015
## 12    2.6893742155  -1.65145646253   -2.893287160388   -6.39867723831
## 19    2.5809429386  -1.77981483512   -2.754657634246   -5.77163261158
## 50    2.5926941837  -1.68870028382   -2.777268116289   -5.97441076286
## 22    2.7309869406  -1.64435247072   -2.918400384982   -6.45618844329
## 17    2.6280262771  -1.76925772511   -2.799875278509   -5.95296817024
## 37    2.3712521897  -1.69569834060   -2.531469453074   -5.21092534686
## 24    2.9870267338  -1.47436073595   -3.168858420368   -7.28926160547
## 79    6.0995481198  12.48538652477  -12.891767312408  -15.46230561121
## 74    2.6305892348   5.35477892246   -5.569836757725   -6.70945130154
## 52    0.4175285576  -2.62500347128    1.114162809055    0.52085503957
## 99    1.5531054643 -50.93328598825   27.049920073479   22.34085296248
## 75    0.1245986270  -0.79265309631    0.332093819386    0.14532675260
## 97    0.4176560877  -2.02247447674    0.770909109283    0.19982140538
## 95    1.6391302628   3.50483100690   -3.551835582644   -4.42918400684
## 87    0.4556068196   0.58277390491   -0.762296395399   -1.10330406058
## 83    0.1930411970  -1.74471871938    0.807699169028    0.49364180129
## 81    0.1448270449  -0.08235265438   -0.091501802269   -0.23390405496
## 90    2.4678272392   5.12970665722   -5.287444975767   -6.42747624147
## 77    2.1292428257   3.19281297473   -3.886729226232   -4.84265964840
## 89    0.9047243391  -9.58137381352    4.632703291095    3.10257468890
## 93    0.1525418865  -0.27037411092    0.009277763913   -0.16146445063
## 57    1.0003029626  -0.69778517023   -0.511061200110   -1.44251328895
## 69   18.5947668076   6.52039712123  -21.727855729013  -27.85733450293
## 96    0.6770301461  -8.10635339391    3.989672293294    2.77202696402
## 68    0.1292480361  -1.37671192393    0.657135528718    0.43440620961
## 91   10.1193926369  17.72362460839  -19.764608083835  -23.52784624631
## 59    0.2091151346   0.24642849413   -0.340889259931   -0.50627915243
## 56    6.3401527776  13.41061160240  -13.657964569070  -16.26432820812
## 100   0.3301206441  -1.17028985640    0.362025123220   -0.05553004119
## 78   18.8790623148  18.05420516061  -28.178743551770  -34.43247012084
## 72    0.1805405320  -1.61204817672    0.743566064785    0.45064154353
## 61    0.7311711333   1.49082434894   -1.560985831855   -1.91126890474
## 105   2.0131831593   0.81969241767   -2.241442492870   -4.57191966390
## 111  13.9661886681  10.09106742316  -18.739761888876  -22.58895342522
## 134  22.4429996738  13.63995530534  -29.054473382034  -35.57170841855
## 149   2.3759210093   0.71125463771   -2.484070189141   -4.72844087995
## 132  15.9897567037   9.26165664905  -20.007897979829  -24.12675946765
## 107   2.4499807111   0.74648084481   -2.676343544625   -4.66828918164
## 126  10.4018787971   3.59600559672  -11.737607604522  -14.63507513533
## 123   3.1799818951   0.97973256219   -3.459165865652   -5.67801439230
## 137   1.8475103881   0.69166742814   -1.982669182492   -4.24669831669
## 127  17.8708961406  10.27572726177  -22.717137596365  -27.65835932559
## 119   1.6911296167   0.75994721838   -1.940520681569   -4.46220848834
```

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## 124 15.5439360948    6.32904991136 -18.302822067311 -22.55807042960
## 146  5.4812319150    1.79413741982  -6.058469563594  -8.25376847070
## 121  3.3930623623    1.17319529718  -3.716800944041  -5.87317072442
## 139 17.1028450529   15.67658641405 -24.948451907248 -29.83971816101
## 128 15.4748268978   12.18854901209 -21.435440061738 -25.81140759181
## 140  9.3311659065    3.47023138935 -10.644915838676 -13.33451975216
## 138  5.7309906227    2.38014691386  -6.657946660906  -8.79054760832
## 113  5.5118215894    1.72195954800  -6.065482663197  -8.22179785643
## 112  5.2633634511    1.48669248546  -5.752137760958  -7.87107720103
## 135  4.7737279086    1.28140325342  -5.224334909158  -7.04119123453
## 145  2.1812760042    0.91391206390  -2.418676981475  -4.70480265853
## 142 11.0167502368    4.50410756733 -12.797692847807 -15.78572263969
## 115  1.5908076386    0.70356887714  -1.797857962355  -4.10073303778
## 125  3.6412144740    1.29606063997  -4.028017807789  -6.08502366717
##                [,9]          [,10]           [,11]           [,12]
## 3      -0.45340848748   0.06538458917   0.48384787501   1.126161146931
## 43     -0.53761219622   0.05877094874   0.57609332822   1.331505213270
## 7      -0.57585500040   0.07896134994   0.61521035549   1.449435345239
## 13     -0.39503164205   0.04780545414   0.42122945912   0.962654502992
## 47     -0.43711739349   0.12379582651   0.46664257158   1.085466912250
## 6      -0.51113675430   0.13541333764   0.54213580338   1.304287693692
## 26     -0.46327508293   0.05173536399   0.49047941960   1.133150333223
## 49     -0.36924284368   0.10799845762   0.39280949066   0.917040345693
## 16     -0.41570290574   0.17016395407   0.43919489894   1.046356864646
## 4      -0.54737470623   0.05003983122   0.58482329325   1.342100444416
## 35     -0.45941423506   0.05777372070   0.48874958326   1.131586309010
## 15     -0.23880180546   0.09797022634   0.25230459010   0.592081524339
## 14     -0.44012462878   0.04344562218   0.47189247254   1.078473897788
## 11     -0.34896917605   0.10500856480   0.37084979210   0.866745136166
## 41     -0.43989599032   0.09506177427   0.46729697193   1.114251178475
## 23     -0.40029505184   0.10229648074   0.42673769385   1.006003213363
## 46     -0.52891659864   0.04808888220   0.56013802150   1.316600633745
## 2      -0.43074177958   0.04993063967   0.45713693724   1.063094815666
## 12     -0.51188808485   0.08268078450   0.54786485621   1.266756625258
## 19     -0.38583176210   0.11752642124   0.40880673747   0.967855235872
## 50     -0.40484103064   0.07507374591   0.43106511970   1.007277312237
## 22     -0.53213465209   0.11553522606   0.56484494640   1.363199760858
## 17     -0.41487264137   0.12808329269   0.43830461717   1.064367392705
## 37     -0.28263774610   0.07808239546   0.29929988735   0.710651847742
## 24     -0.67772505581   0.06798591081   0.71536540449   1.733501288928
## 79     -5.76358264368 -12.07493907256  12.34201477758  14.705861204112
## 74     -2.48920064655  -5.17582748397   5.33308539557   6.384237329838
## 52     -0.29622552298   1.43315362631  -0.55177517730  -0.170848460010
## 99     -1.27238096043  10.64426938430  -4.91928843685  -3.057300533378
## 75     -0.08657397895   0.40745131860  -0.15206300591  -0.035361805456
## 97     -0.30436694955   1.12813751892  -0.36901315479   0.009398506208
## 95     -1.51321394862  -3.51473235703   3.43893790425   4.199599471585
## 87     -0.39541170578  -0.71213412317   0.77880125382   1.046551840738
## 83     -0.13537262040   0.90171466884  -0.38900470763  -0.195609453372
## 81     -0.11678834633  -0.03748712407   0.13204590077   0.234055600042
## 90     -2.32047221188  -4.99025727600   5.06761659197   6.102865624511
## 77     -2.01985378717  -3.07223110147   3.71212834018   4.603875391023
## 89     -0.66363091624   4.98493260398  -2.25393316347  -1.303835194253
## 93     -0.11756465636   0.08691699675   0.06067606831   0.178209296518
```

```
## 57    -0.81348273928   -0.10430653595   0.79830517684   1.477210222668
## 69   -17.74843530642   -6.23209325084  20.74560385407  26.558015665387
## 96    -0.50109186207    4.04207188452  -1.85750377214  -1.117368711229
## 68    -0.09212654713    0.68970442734  -0.30746216379  -0.172752072024
## 91    -9.63841290230  -17.01731360098  18.90431187693  22.443602424093
## 59    -0.18023177779   -0.31888368914   0.35392298279   0.481858451046
## 56    -6.00644354128  -12.94777880467  13.07957363166  15.489345048891
## 100   -0.24485082969    0.61126258509  -0.12515685424   0.155743761828
## 78   -17.99013273940  -17.29639871517  26.90754709538  32.803807690723
## 72    -0.12534768196    0.82269668779  -0.35298572118  -0.173501109392
## 61    -0.68579033903   -1.45628377349   1.49717945688   1.813308174247
## 105   -1.57644277013   -0.62306189887   1.74927412761   3.432960390660
## 111  -13.12212212173   -9.66889934759  17.72569279982  21.142662452194
## 134  -21.39255537385  -13.05006639858  27.72614097127  33.857822463312
## 149   -1.90077427061   -0.60861139500   2.01806908807   3.641305955591
## 132  -15.11829285817   -8.83657839544  18.97177462285  22.715096564552
## 107   -2.06091481073   -0.67006130306   2.28298343866   3.767782041789
## 126   -9.76869466151   -3.38599443272  11.03721380844  13.590125965387
## 123   -2.68498974463   -0.78723148027   2.90801742765   4.551911137139
## 137   -1.43423479444   -0.53709444498   1.54439385185   3.173297213201
## 127  -16.93953950011   -9.82204814157  21.58727776500  26.131130714121
## 119   -1.30938578322   -0.56803997755   1.49304505775   3.308124592011
## 124  -14.70829865535   -6.02303138901  17.34597587419  21.228815697881
## 146   -4.85536571110   -1.58677297141   5.37916775376   7.072576546454
## 121   -2.84160729528   -0.96290579852   3.11295509575   4.694589008467
## 139  -16.16632536486  -15.05226668537  23.72552503665  28.167577864711
## 128  -14.61209908863  -11.68826695323  20.35212943311  24.306157469486
## 140   -8.65103004947   -3.24420390182   9.89654345834  12.177192121946
## 138   -5.24105251389   -2.22611351669   6.12833310816   7.860790367113
## 113   -4.94536782209   -1.53455096661   5.44918211956   7.141589580890
## 112   -4.75515239105   -1.32687207984   5.19893875563   6.882762135653
## 135   -4.41178043762   -1.17664864507   4.83147985423   6.349389034660
## 145   -1.71230943801   -0.69985970515   1.89496511063   3.536948766087
## 142  -10.22555920746   -4.23281052375  11.92129657529  14.483627658106
## 115   -1.22578654265   -0.52903844952   1.38031449884   3.037211641732
## 125   -3.13476757676   -1.13434885712   3.49072823060   5.027946570708
##
## $generalized.weights[[4]]
##                     [,1]             [,2]             [,3]
## 3     0.0000003594568576  0.0002370741197  -0.0003518668479
## 43    0.0000550246578838  0.0002542238007  -0.0004142413226
## 7     0.0000613497541470  0.0002689211258  -0.0004410318071
## 13   -0.0000108078355540  0.0002354245982  -0.0003392903673
## 47   -0.0000299157646967  0.0002188053239  -0.0003059239028
## 6    -0.0000153627104084  0.0002460114172  -0.0003561392865
## 26    0.0000242721050362  0.0002731322344  -0.0004146498634
## 49   -0.0000550371528247  0.0002108239628  -0.0002769425539
## 16   -0.0000749569618146  0.0002085849524  -0.0002611385773
## 4     0.0000724804853168  0.0002826698530  -0.0004646351649
## 35    0.0000120043977688  0.0002590474060  -0.0003891335720
## 15   -0.0000897376718983  0.0001780297141  -0.0002057031777
## 14    0.0000131297382998  0.0002157565557  -0.0003291049923
## 11   -0.0000620292624103  0.0002092046512  -0.0002697582281
## 41   -0.0000292700841715  0.0002289518842  -0.0003212473385
```

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## 23   -0.0000321457874760  0.0001803859868   -0.0002482068520
## 46    0.0000503762347284  0.0002818894760   -0.0004482420903
## 2    -0.0000011469246933  0.0002530633128   -0.0003713997661
## 12    0.0000313358526641  0.0002578657781   -0.0004028862514
## 19   -0.0000586450188384  0.0002255254532   -0.0002957013604
## 50   -0.0000274746601389  0.0002300814748   -0.0003227054089
## 22    0.0000028325669395  0.0002519827690   -0.0003773580798
## 17   -0.0000618921854659  0.0002179468551   -0.0002836713099
## 37   -0.0000763911440535  0.0002031366235   -0.0002509444482
## 24    0.0001550856182771  0.0003151108160   -0.0005678001400
## 79    9.1129445937319282  6.6221159227259  -13.0910682415933
## 74    5.3530660995703681  3.5905094130096   -7.4288089319749
## 52    1.0359329739314680  0.8023693412355   -1.5311442155327
## 99    0.0408175259535746  0.0271137836147   -0.0567568282010
## 75    0.2788256000140337  0.2416722563298   -0.4346793784830
## 97    2.2853953320822242  1.7545252701889   -3.3682898068497
## 95    5.5300193920241796  4.1240038613973   -8.0434207321970
## 87    1.3333935007498843  1.0476247959373   -1.9826913936929
## 83    0.3018438849287632  0.2480525110692   -0.4593030324136
## 81    0.7563613719020305  0.6190065436274   -1.1490015785960
## 90    4.8025708932525761  3.5778864020610   -6.9831109271942
## 77    1.9875304070057569  1.4045593998203   -2.8179171287923
## 89    1.4417347986541329  1.0800974267863   -2.1026842043712
## 93    0.7073345235223847  0.5780497262621   -1.0730346504184
## 57    5.5368315005981943  4.2061195402364   -8.1109479392950
## 69   14.0217587868963882  6.7236232853498  -17.1070150739102
## 96    1.0000235652158962  0.7702426921653   -1.4766828029735
## 68    0.3200948531553138  0.2778979872766   -0.5001368787968
## 91   12.6391709628872189  8.3540055538830  -17.4505130574003
## 59    0.6853765700760145  0.5685525492524   -1.0456626561302
## 56   11.3252985714746188  7.9126415863403  -16.0027767593797
## 100   1.7489670392279886  1.3519270070429   -2.5857208895435
## 78   14.0512604300560238  8.6189492899276  -18.7755445803225
## 72    0.2172314157689057  0.1809855279015   -0.3325061146970
## 61    1.7410576423815902  1.3539759261842   -2.5855874772767
## 105   0.4816926891120757  0.2105648985295   -0.5703940072429
## 111  10.0152041709842567  6.9275911165820  -14.0711425530093
## 134  15.6434215458682946  7.6678086022267  -19.2323060400701
## 149   0.8774372878796362  0.7953319752434   -1.3990707501871
## 132  11.7438681566305938  5.1882797706962  -13.9226671154450
## 107   1.3389801829027488  0.9980678861111   -1.9541086111953
## 126   7.5784947462535142  2.7516809342505   -8.4684128384787
## 123   1.5198212576402088  0.3398867899065   -1.5127675361468
## 137   0.4497533910401690  0.3807992467044   -0.6938513902203
## 127  13.0437504785517682  7.9210821456630  -17.3703748218209
## 119   0.3355960567735780  0.0716071899691   -0.3311084003838
## 124  11.2519050666895311  5.9128021899554  -14.1788561716571
## 146   3.1019943986537251  1.8523644105789   -4.1016063533790
## 121   1.3754584785187527  0.7037247262400   -1.7161545241890
## 139  11.2968335407916474  8.0901710508528  -16.1249183067272
## 128  10.5330825793924561  7.1014113403863  -14.6466256130499
## 140   6.4852226099480825  3.4018942915898   -8.1619420711608
## 138   3.8249449143640053  1.9092746755277   -4.7333467868629
## 113   3.2159062713208515  1.4857284661212   -3.8726870187904
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## 112   3.1253911419349465  1.2902178485927   -3.6314590734808
## 135   3.4733807120492632  1.0760520659713   -3.7257275467359
## 145   0.5166875613670620  0.3408261688312   -0.7119275311415
## 142   8.3560517201867697  5.4324793631213  -11.4306722736405
## 115   0.3056177924130938  0.2318725334297   -0.4487081700864
## 125   1.8932891913283498  1.0328894576655   -2.4189470920012
##                    [,4]                [,5]                [,6]
## 3     -0.0007737932194   0.000220945123104   0.0007578398647
## 43    -0.0008654375788   0.000415890259723   0.0008143653094
## 7     -0.0009265770828   0.000455559708535   0.0008747226837
## 13    -0.0007489138389   0.000165004688718   0.0007351425787
## 47    -0.0007001892574   0.000113176465669   0.0006957439933
## 6     -0.0008047425575   0.000188375891878   0.0007925710114
## 26    -0.0008907391738   0.000281132502215   0.0008732780203
## 49    -0.0006587570279   0.000023954755898   0.0006702390077
## 16    -0.0006433306184  -0.000029481183897   0.0006869102994
## 4     -0.0009603350392   0.000463957672327   0.0008997852708
## 35    -0.0008481643146   0.000250282514759   0.0008286903507
## 15    -0.0005185630667  -0.000096684556775   0.0005432165822
## 14    -0.0006974895350   0.000257850128948   0.0006646492814
## 11    -0.0006503609071  -0.000001396205178   0.0006656673043
## 41    -0.0007369657452   0.000128611622902   0.0007460473184
## 23    -0.0005609318254   0.000100560624840   0.0005681068105
## 46    -0.0009421746615   0.000402186552835   0.0009018071788
## 2     -0.0008194742565   0.000205917670353   0.0008108290630
## 12    -0.0008642020601   0.000323600934897   0.0008227040991
## 19    -0.0007165086098   0.000011759452730   0.0007348582158
## 50    -0.0007365590309   0.000119839659886   0.0007358751122
## 22    -0.0008346350345   0.000260307161452   0.0008172151703
## 17    -0.0006823910144   0.000021273207924   0.0007177756655
## 37    -0.0006217633130  -0.000052172160273   0.0006460437750
## 24    -0.0010970168974   0.000791258449884   0.0009226707024
## 79   -12.7748744020109  12.493944448895586   9.1558494797941
## 74    -7.5131594122833   8.007979549810431   5.4217698728793
## 52    -1.4504517941018   2.057594207488219   1.6143896210074
## 99    -0.0586410705829   0.143570272547358   0.0901002296359
## 75    -0.3903887575928   0.703571225582257   0.6182686472833
## 97    -3.2129804071920   3.973057232853949   3.0771924262436
## 95    -7.7737179264242   8.260544516107720   6.2081549365975
## 87    -1.8633579638875   2.529645645996666   2.0158784007583
## 83    -0.4248162614019   0.758424919714809   0.6292804603058
## 81    -1.0657090506113   1.613974188944805   1.3324510322493
## 90    -6.7541121313368   7.356134122488309   5.5224258302881
## 77    -2.7795472497433   3.496430966782189   2.5046849065319
## 89    -2.0310499972882   2.718666401801728   2.0523691342607
## 93    -0.9939615932297   1.520270187338826   1.2555755964897
## 57    -7.5507558969842   8.201594213566947   6.2939016997079
## 69   -19.6930397205276  17.903642661485669   8.6408113830201
## 96    -1.4081801340274   2.018818101950873   1.5684906790928
## 68    -0.4508582126374   0.795758560578001   0.6978173481460
## 91   -17.7967103850606  16.500158474676979  10.9683102429187
## 59    -0.9582949607718   1.463713686784139   1.2320252047829
## 56   -15.9164543300986  15.029801995807890  10.5722913251549
## 100   -2.4586584237527   3.190736287448904   2.4891457087194
```

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## 78  -19.6674277837812 17.975286912930674 11.1226421390390
## 72   -0.3049985775047  0.576312229323831  0.4856687742624
## 61   -2.4634608512213  3.216020181797207  2.5150780600088
## 105  -0.6783800423042  1.009835347961484  0.4439059830465
## 111 -14.0135137815466 13.464388459333017  9.4006100960804
## 134 -21.9711864557541 19.689668322021781  9.7120045509404
## 149  -1.2292752001115  1.687588204953511  1.5452035586657
## 132 -16.4464057806796 15.437880909019734  6.8815739419779
## 107  -1.9020382382090  2.420586600367613  1.8014655216865
## 126 -10.6383885757624 10.654527151832200  3.8952819710587
## 123  -2.1361589495574  2.741984648347578  0.6134401134242
## 137  -0.6311389371566  0.943874177086577  0.8068060302885
## 127 -18.2901415536359 16.870788033494083 10.3241507799251
## 119  -0.4719789497079  0.736506275154248  0.1567470489394
## 124 -15.7897014972330 14.883182745144433  7.8799530459559
## 146  -4.3443929512980  5.005930612968790  3.0238394396467
## 121  -1.9291137532666  2.508848598280246  1.2981825052698
## 139 -15.8375010510116 14.898767809512250 10.7520973097128
## 128 -14.7682931695612 14.051332110995187  9.5491474824386
## 140  -9.0857851113212  9.344175699349682  4.9507408472911
## 138  -5.3734210537516  5.976908529864889  3.0080998141119
## 113  -4.5123144859420  5.168552378850344  2.4108301487558
## 112  -4.3941299914416  5.042475377483074  2.0958134718191
## 135  -4.8979177390863  5.508692422360406  1.7070659221102
## 145  -0.7245982909539  1.070911392677241  0.7147498716021
## 142 -11.6808538694208 11.563573337774276  7.5984433177136
## 115  -0.4314271236289  0.670767850241706  0.5108816648751
## 125  -2.6559831328333  3.292807200904055  1.8156580699481
##                  [,7]             [,8]              [,9]
## 3    -0.0012336783794  -0.003902733407 -0.000261634990115
## 43   -0.0014473591362  -0.004267868788 -0.000482365328307
## 7    -0.0015631003305  -0.004620752720 -0.000528199946014
## 13   -0.0011565377558  -0.003677152189 -0.000197459327721
## 47   -0.0010759854383  -0.003588647557 -0.000139633203172
## 6    -0.0012659470199  -0.004124002705 -0.000225857000021
## 26   -0.0014226752664  -0.004316160802 -0.000328412598097
## 49   -0.0009784427753  -0.003416478311 -0.000038633034570
## 16   -0.0009678862711  -0.003540212665  0.000021012696883
## 4    -0.0015931612867  -0.004607328968 -0.000536051561237
## 35   -0.0013472989537  -0.004178182002 -0.000294182704277
## 15   -0.0007157027448  -0.002736753219  0.000097753162182
## 14   -0.0011247796979  -0.003441609331 -0.000302982009606
## 11   -0.0009546754660  -0.003380236419 -0.000009906357441
## 41   -0.0011578689959  -0.003863160724 -0.000157760731299
## 23   -0.0008849944034  -0.002980690213 -0.000125129794165
## 46   -0.0015526022223  -0.004592801633 -0.000467011642838
## 2    -0.0012914572133  -0.004072610490 -0.000244080256375
## 12   -0.0013951582858  -0.004244073221 -0.000377450304861
## 19   -0.0010621573345  -0.003729987409 -0.000024713231291
## 50   -0.0011339387965  -0.003748801658 -0.000147052225773
## 22   -0.0013500544326  -0.004287017775 -0.000307748726046
## 17   -0.0010461258428  -0.003712817918 -0.000036641753371
## 37   -0.0008918490025  -0.003255749669  0.000047556311226
## 24   -0.0018447609767  -0.004810704302 -0.000910934103681
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## 79   -17.9933213052341  -17.453464131699  -13.094402890074781
## 74   -11.1422306927048  -11.200177573327   -8.484138411741668
## 52    -3.0540666044508   -2.866430412553   -2.243475380789018
## 99    -0.1935417961112   -0.202570203477   -0.167255030252396
## 75    -1.1018758612306   -0.978928784127   -0.781258357071291
## 97    -5.8662593091548   -5.551283373147   -4.278623448446733
## 95   -12.0350199154836  -11.554105916204   -8.750201158059788
## 87    -3.7814567165687   -3.521588134376   -2.746977297101373
## 83    -1.1557367084435   -1.058434224404   -0.841940758939924
## 81    -2.4547354641360   -2.256692808113   -1.770299689161823
## 90   -10.7121099177285  -10.290043040140   -7.815009017325773
## 77    -4.9813961261757   -4.874886269255   -3.769774218492316
## 89    -3.9677237781077   -3.801137981795   -2.950611210674342
## 93    -2.3119600558711   -2.121557450641   -1.668477660460839
## 57   -12.0553208338248  -11.439253944863   -8.679096712858330
## 69   -21.8729912057819  -25.092631787254  -18.583874376199425
## 96    -2.9847071856250   -2.821930183079   -2.204263964047121
## 68    -1.2457069790090   -1.112524554194   -0.882729979113500
## 91   -22.8011560755844  -23.143185650520  -17.180101197443467
## 59    -2.2452266170609   -2.037306231680   -1.605590566203846
## 56   -21.2699216902897  -21.042912933067  -15.684255345692687
## 100   -4.7262439731007   -4.456665205089   -3.452306896528649
## 78   -24.0875384569493  -25.113757741875  -18.663220035799057
## 72    -0.8845189027669   -0.802829143093   -0.642079272786419
## 61    -4.7730633333541   -4.515415388520   -3.483736273894655
## 105   -1.1951030671887   -1.413925180504   -1.106062572014602
## 111  -18.9767280640294  -18.790627657647  -14.075102410496767
## 134  -24.2391040187890  -27.595541189783  -20.396049277501795
## 149   -2.6981465554617   -2.345893738354   -1.834839665634741
## 132  -18.3491209233655  -21.600013167156  -16.089318140070830
## 107   -3.5132452045756   -3.390649021970   -2.616744979034269
## 126  -11.9215599835596  -14.934867181715  -11.202662361395610
## 123   -2.7279123704633   -3.849506695483   -2.963616567124618
## 137   -1.4588464306531   -1.312894837216   -1.033904986780197
## 127  -22.5146495114464  -23.594965038591  -17.543421264735677
## 119   -0.7256880734606   -1.034041475532   -0.809629386145823
## 124  -18.7888090906346  -20.835081968002  -15.524311461728532
## 146   -6.6421934661495   -6.989913371358   -5.349303046294518
## 121   -3.1390684605648   -3.507059139216   -2.714469672271121
## 139  -21.3132914272373  -20.814974713270  -15.534365192964344
## 128  -19.5829066925902  -19.637132262347  -14.673455957034985
## 140  -11.7939808575249  -13.064415483606   -9.855069309007794
## 138   -7.4077852856945   -8.367383185082   -6.364189654022840
## 113   -6.2378145167635   -7.233360335703   -5.520620426291766
## 112   -5.8634918737407   -7.066762941711   -5.388213942606593
## 135   -5.8996218183831   -7.741369746724   -5.875352266585415
## 145   -1.4799590855796   -1.493298386451   -1.171861669414031
## 142  -15.8783060160390  -16.132695293166  -12.133968904259806
## 115   -0.9824783679405   -0.935106042122   -0.737368681193949
## 125   -4.2180685845340   -4.602317780294   -3.546206728926321
##                  [,10]             [,11]             [,12]
## 3     -0.0008539294117   0.0013963323043   0.004481654903
## 43    -0.0009176797726   0.0016378037797   0.004897061841
## 7     -0.0009873513180   0.0017712150639   0.005309090634
```

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## 13    -0.0008271489498   0.0013070205812   0.004217872108
## 47    -0.0007836322292   0.0012179040303   0.004122456249
## 6     -0.0008961858590   0.0014375975594   0.004754415277
## 26    -0.0009851937889   0.0016102015501   0.004956512946
## 49    -0.0007548999995   0.0011077547257   0.003926170641
## 16    -0.0007756678093   0.0010990058875   0.004079194406
## 4     -0.0010141604636   0.0018019588412   0.005284905879
## 35    -0.0009343549822   0.0015247871340   0.004797448756
## 15    -0.0006102841027   0.0008094660368   0.003145561329
## 14    -0.0007471069231   0.0012710143520   0.003947253775
## 11    -0.0007497963773   0.0010809543270   0.003884855643
## 41    -0.0008418842880   0.0013128033575   0.004444062342
## 23    -0.0006393254283   0.0010020532843   0.003426596955
## 46    -0.0010184616167   0.0017594433788   0.005281225417
## 2     -0.0009142370167   0.0014618383458   0.004677299213
## 12    -0.0009271736955   0.0015784953610   0.004870795494
## 19    -0.0008299348474   0.0012050622168   0.004293867363
## 50    -0.0008292787215   0.0012837087907   0.004306603746
## 22    -0.0009238701524   0.0015327641995   0.004939700283
## 17    -0.0008108855115   0.0011880288095   0.004278754430
## 37    -0.0007276476120   0.0010099962364   0.003742509586
## 24    -0.0010496111853   0.0021025099204   0.005585967038
## 79    -9.6063697491050  18.8642663503336  18.283947380044
## 74    -5.7504693032418  11.8083840604951  11.861240431639
## 52    -1.7621851809885   3.3311829832473   3.124015758386
## 99    -0.1069842560103   0.2270972758606   0.235831235727
## 75    -0.6871755651874   1.2239269392106   1.086563642219
## 97    -3.3167679566036   6.3185764684711   5.974533950865
## 95    -6.5821494794290  12.7509258588939  12.231728156428
## 87    -2.1918699657008   4.1083091011540   3.822811846757
## 83    -0.6990427406247   1.2831450572768   1.174317233541
## 81    -1.4625253797743   2.6927523180604   2.473745514423
## 90    -5.8720638288420  11.3822882275365  10.925180972701
## 77    -2.7040918867633   5.3734009762779   5.254414681926
## 89    -2.2290225412607   4.3065036495806   4.122576913065
## 93    -1.3791278534248   2.5378448091784   2.327097904517
## 57    -6.6683545733891  12.7623369257390  12.099976985944
## 69    -8.9772846119338  22.7084236257033  26.038327005509
## 96    -1.7138288353694   3.2592167157689   3.079214844500
## 68    -0.7746164217087   1.3820397269316   1.233490674591
## 91   -11.4292313275405  23.7436040022022  24.083971114898
## 59    -1.3530055471802   2.4639136585001   2.233969549457
## 56   -11.0427198121212  22.2006954153046  21.947945357091
## 100   -2.6955356042317   5.1146134940809   4.819060129405
## 78   -11.5624658797177  25.0194346062465  26.068144649581
## 72    -0.5415178195008   0.9856575392153   0.893997980175
## 61    -2.7258692667879   5.1700967892067   4.887752983116
## 105   -0.4864263816561   1.3089230019978   1.547921572700
## 111   -9.8391370965202  19.8457592163441  19.636097726975
## 134 -10.0694811390369  25.1134968713808  28.576838663249
## 149   -1.6815421638522   2.9342844371867   2.548796768469
## 132   -7.1806885913995  19.1301101547879  22.508688534406
## 107   -1.9471593836227   3.7959458350982   3.660468283539
## 126   -4.0992364355151  12.5369964701374  15.700343554727
```

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## 123  -0.6630480990289   2.9482671966623   4.160197661002
## 137  -0.8844441415905   1.5982379600555   1.437086178344
## 127 -10.7472047568728  23.4192183909550  24.526790355186
## 119  -0.1722750688362   0.7976544449441   1.136553765669
## 124  -8.2277391932817  19.6030025279329  21.725478261330
## 146  -3.2352586265230   7.1004822229718   7.466941388101
## 121  -1.4060754529074   3.3972428290621   3.793295476619
## 139 -11.2224878510374  22.2292124362059  21.692715287323
## 128  -9.9825599602647  20.4561178770931  20.497582910301
## 140  -5.2278067081928  12.4432230581207  13.775238295545
## 138  -3.2059644249388   7.8891465947939   8.906061850118
## 113  -2.5777265079022   6.6643124141973   7.723893484293
## 112  -2.2411591448137   6.2660492298881   7.548666311796
## 135  -1.8207446763160   6.2912063137098   8.253498307069
## 145  -0.7828790540506   1.6198643699299   1.633294357521
## 142  -7.9841603268370  16.6696341453865  16.924154418703
## 115  -0.5617752431254   1.0798292791263   1.026948117803
## 125  -1.9574549407464   4.5438596462082   4.954665798477
##
## $generalized.weights[[5]]
##                [,1]            [,2]              [,3]             [,4]
## 3              NaN             NaN               NaN              NaN
## 43             NaN             NaN               NaN              NaN
## 7              NaN             NaN               NaN              NaN
## 13             NaN             NaN               NaN              NaN
## 47             NaN             NaN               NaN              NaN
## 6              NaN             NaN               NaN              NaN
## 26             NaN             NaN               NaN              NaN
## 49             NaN             NaN               NaN              NaN
## 16             NaN             NaN               NaN              NaN
## 4              NaN             NaN               NaN              NaN
## 35             NaN             NaN               NaN              NaN
## 15             NaN             NaN               NaN              NaN
## 14     0.03166545812   0.05725624663   -0.0001178556694    0.05734362091
## 11             NaN             NaN               NaN              NaN
## 41             NaN             NaN               NaN              NaN
## 23             NaN             NaN               NaN              NaN
## 46             NaN             NaN               NaN              NaN
## 2              NaN             NaN               NaN              NaN
## 12             NaN             NaN               NaN              NaN
## 19             NaN             NaN               NaN              NaN
## 50             NaN             NaN               NaN              NaN
## 22             NaN             NaN               NaN              NaN
## 17             NaN             NaN               NaN              NaN
## 37             NaN             NaN               NaN              NaN
## 24             NaN             NaN               NaN              NaN
## 79    16.86357990213  39.33815921191  -46.2300156867659  -59.03186001513
## 74    12.18229753558  31.92185863082  -33.6367608467561  -45.46113948085
## 52     5.46446522993  15.18963865324  -15.9681421954472  -22.56864402794
## 99     0.56560385526   1.89297534234   -1.3701787630771   -2.03001223515
## 75     3.03184977177   8.73266665502   -8.5756957624358  -12.21136735692
## 97     4.95183763388  13.95531210116  -13.6695277297897  -19.12018358058
## 95     9.69740863339  25.04791264243  -25.7666408818450  -34.11345925801
## 87     9.46189806215  24.24469320799  -27.2349262662103  -36.94000666427
```

```
## 83    2.19919386584  6.51188803591  -5.8567461100814   -8.31809757650
## 81    4.15641714471 11.65767648343 -10.2214381378224  -13.76095746465
## 90   10.43269352917 25.52878711569 -26.4287500248213  -33.43133379254
## 77   15.34547088064 34.63606587451 -42.1418370443837  -53.04968252424
## 89    2.96519358843  8.66121391268  -8.2418782804390  -11.74879448626
## 93    4.06314487726 11.36952861268 -10.6550001646768  -14.62878928026
## 57   12.48720176629 32.51932016406 -36.4354095409455  -49.99778069471
## 69   30.72482631105 45.25365029982 -73.4259259030454  -70.03783966656
## 96    2.32865686011  6.85055303084  -6.4444188228350   -9.19952894270
## 68    1.76761450179  5.24972978185  -4.6175806605191   -6.51501239808
## 91   16.21753065699 40.32908223967 -42.3683251006360  -54.72338813999
## 59    6.10747484716 16.51004051903 -17.2987977355838  -23.90695165039
## 56   14.91809151618 37.81412395705 -40.5723243393431  -53.70576511201
## 100   4.95475200444 13.78739548764 -13.4511873779359  -18.60950031149
## 78   30.43389293097 55.41170515260 -82.0147176820365  -93.13525198366
## 72    2.30299967524  6.77194628431  -6.3545692886757   -9.08796032142
## 61    8.10824749324 21.16809814756 -17.1629196379743  -20.81730860254
## 105   3.61108676538  3.41853617278  -8.6454176406324   -6.68358766956
## 111  26.52076805175 39.96976929399 -69.6949338895119  -71.86226209993
## 134  31.96279572361 59.00078951753 -84.5394631529090  -95.66868349335
## 149   8.22990676492  9.84811479089 -20.7882561462121  -18.77436540834
## 132  11.55608303704 20.01819125602 -32.0159204674526  -36.03017995066
## 107  23.35353006622 33.89020761518 -55.7008946178059  -52.55779066235
## 126  11.97448830679 17.66564595047 -31.4733907189759  -32.21565468402
## 123   1.77343721686  1.50197627225  -4.1895172755768   -3.03376340638
## 137   4.64720042962  4.82510892614 -11.4640168685714   -9.50387016949
## 127  30.86178821213 46.21834409870 -78.7876993783821  -79.55382859159
## 119   0.74128527502  0.45465046029  -1.6527798167540   -0.91545590098
## 124  28.34441535445 38.62497581021 -70.9644847315367  -67.80337067980
## 146  13.48117630682 13.22218922432 -32.9718240886839  -26.69450457618
## 121   6.46133655757  6.27130666690 -15.8308387333476  -12.70221841410
## 139  31.54001966837 54.30518216026 -83.2348443373870  -91.15211485568
## 128  30.63633447483 51.31631619848 -80.6030432647345  -87.06878758541
## 140  16.36591583962 19.25081763236 -41.2951319283429  -37.18894106238
## 138  16.44085209070 25.55346204291 -43.0167688647164  -44.89361297711
## 113  11.22808367399 12.11626382278 -27.7567811212578  -23.63004497722
## 112  13.51418094837 15.31639344207 -32.8809339946047  -28.21627024072
## 135  13.57661038279 21.75805509581 -34.1221324115513  -35.35344034109
## 145   4.11277095482  3.54651587178  -9.9024205403532   -7.36195986474
## 142  20.01926266925 21.49474425287 -50.0507582395217  -43.17459796417
## 115   5.51539327241  4.68800649254 -12.8164362409469   -9.06839994443
## 125   8.84962426214 11.16553822036 -22.5877252449915  -21.10029065423
##                    [,5]                [,6]                [,7]
## 3     0.000030784443620 -0.000054494034770  -0.00018105972321
## 43    0.000026060779216 -0.000095849526847  -0.00023035509444
## 7     0.000074690505869  0.000017907863470  -0.00018873263063
## 13   -0.000007742947461 -0.000147449877095  -0.00022409303751
## 47    0.000071731465799  0.000036603315049  -0.00012916391349
## 6     0.000068114056918  0.000045785531109  -0.00011684630384
## 26    0.000059267875124 -0.000017157788729  -0.00023572567023
## 49    0.000055700572786  0.000028972057132  -0.00010308743649
## 16    0.000038123779040  0.000023682943121  -0.00006122843240
## 4     0.000053463515995 -0.000058397708229  -0.00026594510438
## 35    0.000051605033986 -0.000025027567530  -0.00020852669556
```

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```
## 15    0.000028474556913   0.000018684321500   -0.00004480657466
## 14   -0.000128280410568  -0.000395827437710   -0.00026494896204
## 11    0.000052458480798   0.000028571477915   -0.00009574776646
## 41    0.000051862349482   0.000021488204170   -0.00011497729324
## 23    0.000029440246413  -0.000021393129016   -0.00010749103080
## 46    0.000045784458809  -0.000026807073491   -0.00022221222492
## 2     0.000024035473427  -0.000067576007208   -0.00020386973947
## 12    0.000086833930670   0.000024402360263   -0.00020462982256
## 19    0.000056399437073   0.000038336315796   -0.00009574362955
## 50    0.000049158492167  -0.000002132287471   -0.00014734654078
## 22    0.000068529280503   0.000045896720789   -0.00012353751445
## 17    0.000042189822261   0.000029483807135   -0.00007038337549
## 37    0.000036830336809   0.000015497484020   -0.00007938197651
## 24    0.000110742233678   0.000103222184829   -0.00022077362431
## 79    7.323330208742260  16.912281376506492  -20.78699087330835
## 74    4.714862866527064  12.259936682420111  -13.64681857622370
## 52    1.919966077427570   5.285743325138434   -5.79817905969829
## 99    0.045011670767774   0.134837241698500   -0.11386921276391
## 75    0.874412073169167   2.500403290981774   -2.61608417957250
## 97    1.508685428124724   4.225523337347305   -4.43500204247936
## 95    3.357044972238604   8.603608428075765   -9.51681130775672
## 87    3.747771443700621   9.506509694655477  -11.09255304387441
## 83    0.508645198383121   1.504606317598059   -1.48967049066776
## 81    0.947542540177299   2.659640911582671   -2.64419222296142
## 90    3.496992038416988   8.476028888186013   -9.59359991569806
## 77    6.617514880189717  14.772554570122676  -18.75468337352629
## 89    0.808991604374836   2.350477277342607   -2.40505289404396
## 93    1.072074291676421   2.988723562660290   -3.07661705610708
## 57    5.295080166076691  13.661604991387666  -15.80908151694670
## 69   15.841828821088203  22.833081437101352  -39.35915644047197
## 96    0.598724264071157   1.752676622343269   -1.77968853990892
## 68    0.371549741708271   1.103938555292570   -1.08010764553338
## 91    6.371381128297587  15.721167880533020  -17.71400518236837
## 59    2.100328543107695   5.626580557210412   -6.21233885085227
## 56    6.016774523846415  15.130075685333601  -17.17023968548474
## 100   1.471226161731626   4.069695637815427   -4.28203036949049
## 78   16.067085204576561  28.959998479889993  -44.01646428867094
## 72    0.588779399380847   1.723782538019031   -1.74967847063597
## 61    1.661670329709718   4.343934421252051   -4.26328668876701
## 105   1.678516389199716   1.549152261911940   -4.10011348966403
## 111  14.525142059552467  21.665470643103415  -38.63562349307045
## 134  17.324595590869933  31.656171919498888  -46.81431039434253
## 149   4.122656147141003   4.861324844093495  -10.55091676212460
## 132   5.921790053488088  10.166455721460730  -16.49449334421454
## 107  13.031634438248979  18.562645579093171  -32.11931853921495
## 126   6.206670898956033   9.051919323133552  -16.51743373020556
## 123   0.763112009772359   0.627248929196224   -1.84086838211715
## 137   2.200873001122753   2.244353899636715   -5.50622124920200
## 127  16.860679895677841  24.921891927497889  -43.89264029517093
## 119   0.289441805313199   0.168337575050970   -0.66204197323411
## 124  15.592887946026330  20.935135622852336  -39.82452194480562
## 146   7.075700478770715   6.824827232048639  -17.53887361256194
## 121   3.160936588037212   3.014914297212023   -7.84578572948754
## 139  17.143986347285530  29.207165355810421  -46.06520446530154
```

```
## 128 16.755290251270541 27.767430251269410 -44.84581921489836
## 140  8.710184572095084 10.110622655040233 -22.24687242632875
## 138  8.779442612698011 13.487988268710550 -23.33575598687683
## 113  5.803702580792483  6.160034759981959 -14.55852863951897
## 112  7.154701218575288  7.949982255741841 -17.77107094884685
## 135  7.282397429064473 11.500859093818292 -18.83307396530997
## 145  1.920793251389209  1.623370930260566  -4.68610689935009
## 142 10.815314790396624 11.462765375875186 -27.33643337497092
## 115  2.691694089514238  2.216701086316662  -6.40007277296530
## 125  4.463320685900106  5.554339801381621 -11.53986508262433
##                     [,8]            [,9]           [,10]
## 3     -0.0001701857717405  -0.026352696750  -0.045850224405
## 43    -0.0002376437962700  -0.034857459223  -0.059701491143
## 7     -0.0000984626630464  -0.019449423272  -0.031852414933
## 13    -0.0002958991757163  -0.038634360805  -0.068523663374
## 47    -0.0000183085854117  -0.009314894809  -0.013879759516
## 6     -0.0000176609556516  -0.005739524035  -0.008126349048
## 26    -0.0002029546646914  -0.029207822756  -0.050960645154
## 49    -0.0000198744819646  -0.008597121463  -0.013557010959
## 16    -0.0000004851443923  -0.002724695234  -0.003681393232
## 4     -0.0002405690578289  -0.035480661764  -0.060358188682
## 35    -0.0001740268221415  -0.026740624780  -0.046226258824
## 15     0.0000004866943606  -0.004011225710  -0.006635116923
## 14    -0.0005608053795221  -0.060092662265  -0.108875035136
## 11    -0.0000175101618838  -0.007950342846  -0.012605840514
## 41    -0.0000478709486642  -0.011747747429  -0.019690479176
## 23    -0.0000726151484851  -0.015464450222  -0.026708680601
## 46    -0.0002163166724057  -0.029176114049  -0.052389306975
## 2     -0.0002219780749694  -0.030412763769  -0.054461349369
## 12    -0.0000908850844331  -0.019725398369  -0.031363032616
## 19    -0.0000130785533907  -0.005521479901  -0.008214774821
## 50    -0.0000937327798691  -0.017848687855  -0.030447094579
## 22    -0.0000282594046745  -0.008155873169  -0.012566303224
## 17    -0.0000084237828854  -0.004891865798  -0.007718198707
## 37    -0.0000301408331268  -0.008923501818  -0.015406352883
## 24    -0.0001080940153806  -0.013249796049  -0.021879685713
## 79   -26.7826739825723443 -22.177512738269 -51.961502373095
## 74   -18.6467501461799721 -16.786103640370 -44.111235892369
## 52    -8.2283307887988517  -7.788633120979 -21.718223629273
## 99    -0.1641962355186921  -0.915916979391  -2.967978547382
## 75    -3.7629675851325679  -4.575039640721 -13.201689279267
## 97    -6.2870944150540371  -7.365243104388 -20.791707192830
## 95   -12.8231427477125912 -13.888656877527 -35.963372704715
## 87   -15.1083489697064461 -12.923628116224 -33.243248383646
## 83    -2.1623332964517856  -3.485546175878 -10.322827495554
## 81    -3.6949732257281767  -6.605909179194 -18.525172168297
## 90   -12.4552270793521664 -15.094053728335 -37.042936684782
## 77   -23.7995846653310359 -20.242899745663 -45.907653835613
## 89    -3.4742402424733698  -4.535860754737 -13.265759810006
## 93    -4.3227765254144321  -6.263875650928 -17.542473180277
## 57   -21.7525765548593846 -16.591854784394 -43.378721567955
## 69   -38.4363490224331628 -37.084919887011 -55.285658898459
## 96    -2.5768751385774582  -3.610800949678 -10.633961202098
## 68    -1.5634342584439254  -2.851076273548  -8.466955834175
```

```
## 91  -23.3134379672553891  -22.220307730385  -55.419924239699
## 59   -8.6544499595385069   -8.765691962625  -23.763840370418
## 56  -23.0112716876454648  -20.232662295986  -51.446431000817
## 100  -6.0202228476855471   -7.420549600833  -20.681078875606
## 78  -50.2466677291838266  -36.234957355731  -66.364259507172
## 72   -2.5403526423207077   -3.575467440618  -10.523616177105
## 61   -5.5914430020514905  -13.134927207990  -34.283433448625
## 105  -3.2229678829367860              NaN               NaN
## 111 -40.0298220917804173  -30.879529707632  -46.838711181373
## 134 -53.3984509655078412  -37.456673619849  -69.572266606726
## 149  -9.5987159776497073              NaN               NaN
## 132 -18.5585845507572955              NaN               NaN
## 107 -30.9309412936375736              NaN               NaN
## 126 -16.9897973502779287              NaN               NaN
## 123  -1.3593823746193994              NaN               NaN
## 137  -4.6089023233135364              NaN               NaN
## 127 -44.7459759261973815  -35.989825882851  -54.334715867340
## 119  -0.3800430739481555              NaN               NaN
## 124 -38.4803545197921864  -32.911244089959  -45.264663942250
## 146 -14.3446757397277693              NaN               NaN
## 121  -6.3563979561454058              NaN               NaN
## 139 -50.7957223045393462  -36.896701920422  -63.941791660976
## 128 -48.7723245214491641  -35.703274043684  -60.199529319798
## 140 -20.1772660884316082              NaN               NaN
## 138 -24.5143880021226934              NaN               NaN
## 113 -12.5177390693066588              NaN               NaN
## 112 -15.4725227500992908              NaN               NaN
## 135 -19.7923450071795095              NaN               NaN
## 145  -3.5236218010616307              NaN               NaN
## 142 -23.7489706086680741              NaN               NaN
## 115  -4.6316428971532311              NaN               NaN
## 125 -10.8513416082509870              NaN               NaN
##                 [,11]            [,12]
## 3     0.0033436249821  -0.043461506336
## 43    0.0053874859503  -0.056622675552
## 7     0.0053613486436  -0.028628815873
## 13    0.0036753476953  -0.064839462902
## 47    0.0035294693404  -0.013218322458
## 6     0.0032681472734  -0.006528872383
## 26    0.0069840701639  -0.042282441651
## 49    0.0024013279999  -0.013057649117
## 16    0.0015268288714  -0.003306800010
## 4     0.0081662213264  -0.053244932380
## 35    0.0054477519890  -0.040727829100
## 15    0.0005358812298  -0.006860320603
## 14   -0.0001291503554  -0.109259669360
## 11    0.0021538841042  -0.012130854057
## 41    0.0023819086836  -0.018404694118
## 23    0.0006950093951  -0.027931657202
## 46    0.0060067900731  -0.042666848373
## 2     0.0041954349481  -0.048260171010
## 12    0.0062205341720  -0.028489786482
## 19    0.0025126468227  -0.007066223688
## 50    0.0030130811651  -0.028616711699
```

```
## 22   0.0033973518829  -0.010615421091
## 17   0.0015443192872  -0.007084206402
## 37   0.0009400728973  -0.015136446802
## 24   0.0072148398557  -0.012996365127
## 79  59.8529824692730  76.108998117628
## 74  45.5129655046501  61.242842980444
## 52  22.5102871247131  31.770552502881
## 99   2.0583303914458   2.957136089304
## 75  12.7508803327576  18.106389116077
## 97  19.9724603462592  27.825180147271
## 95  36.1096139538008  47.509889778445
## 87  36.7936223767678  49.821174101699
## 83   9.1029222079317  12.866547529780
## 81  15.8278402790396  21.129136183994
## 90  37.2604879048026  46.708108900681
## 77  54.8180922499430  68.753793120404
## 89  12.3996869345353  17.614820279223
## 93  16.0735053115918  21.936891590913
## 57  47.9348739548387  65.699442284365
## 69  86.6307463253629  81.445910288880
## 96   9.8295081815672  13.983508762806
## 68   7.3023844881400  10.250544797265
## 91  56.6299739812870  72.567225353884
## 59  24.4778458371352  33.736695030115
## 56  53.9540930229266  71.043170259843
## 100 19.7626163573702  27.213518504135
## 78  96.6931801613052 109.455839353280
## 72   9.6993712461914  13.820928126360
## 61  26.8114296717617  31.961407291538
## 105              NaN               NaN
## 111 80.5321333537153  82.780286097028
## 134 97.7519398649735 110.060576914882
## 149              NaN               NaN
## 132              NaN               NaN
## 107              NaN               NaN
## 126              NaN               NaN
## 123              NaN               NaN
## 137              NaN               NaN
## 127 90.7511189549618  91.066636018384
## 119              NaN               NaN
## 124 81.3542649241054  77.159018637248
## 146              NaN               NaN
## 121              NaN               NaN
## 139 96.2788677917844 104.973235995028
## 128 92.9194046967136  99.935683327871
## 140              NaN               NaN
## 138              NaN               NaN
## 113              NaN               NaN
## 112              NaN               NaN
## 135              NaN               NaN
## 145              NaN               NaN
## 142              NaN               NaN
## 115              NaN               NaN
## 125              NaN               NaN
```

```
##
##
## $result.matrix
##                                         1                    2
## error                       0.0006176325899      0.0008181158784
## reached.threshold           0.0080970686388      0.0096356105298
## steps                     864.0000000000000    869.0000000000000
## Intercept.to.1layhid1        2.8149342314638     -0.5042759167857
## Sepal.Length.to.1layhid1     3.2572067885327     -0.6509581473524
## Sepal.Width.to.1layhid1      4.9341181921651      7.1323330227629
## Petal.Length.to.1layhid1     4.6073083914246     -8.1569478873540
## Petal.Width.to.1layhid1      5.1976877351609     -6.1794229309402
## Intercept.to.1layhid2        2.0629438823935      1.4898645554444
## Sepal.Length.to.1layhid2     0.7019152969370      0.2932466485720
## Sepal.Width.to.1layhid2     -0.9247935004644      0.2853556536903
## Petal.Length.to.1layhid2    -0.6369430829172     -0.4963126723227
## Petal.Width.to.1layhid2     -0.7752154838807     -1.2965505619318
## Intercept.to.1layhid3       -0.1443406321292      3.8160057614043
## Sepal.Length.to.1layhid3    -0.2515157066068      3.9606868986294
## Sepal.Width.to.1layhid3     -0.8184305691951      3.5654813467305
## Petal.Length.to.1layhid3     0.4785367375216      4.4347445878797
## Petal.Width.to.1layhid3      1.0735646356468      5.5625618056271
## Intercept.to.1layhid4        0.9428164434930      3.2855368124715
## Sepal.Length.to.1layhid4     0.2108354600473     -0.1517217758392
## Sepal.Width.to.1layhid4    -35.0933292850130      6.2051581101872
## Petal.Length.to.1layhid4     9.9058171995039     -1.5880497186349
## Petal.Width.to.1layhid4     34.5027685288309     -7.3909290550138
## Intercept.to.1layhid5        0.2480356010854      0.1800002856558
## Sepal.Length.to.1layhid5     0.4489698492098     -0.3501270854107
## Sepal.Width.to.1layhid5      0.1347821321166     -1.8262778687276
## Petal.Length.to.1layhid5    -0.4184702513383      1.1685009008647
## Petal.Width.to.1layhid5     -0.7095907953792      0.8588273631744
## Intercept.to.2layhid1       -1.5471547680342      0.2078055861629
## 1layhid.1.to.2layhid1        0.9773255872028     49.8705447892816
## 1layhid.2.to.2layhid1        6.8279343159720     23.8631422106902
## 1layhid.3.to.2layhid1      -12.6671902066084      0.8464179487818
## 1layhid.4.to.2layhid1        0.4920808489791      7.1397207123979
## 1layhid.5.to.2layhid1        7.5984631895548      3.2550687942495
## Intercept.to.2layhid2       -1.2296023119435      0.3768459921534
## 1layhid.1.to.2layhid2       -0.4953280479062      8.5323756816934
## 1layhid.2.to.2layhid2       -7.5756260975450    -13.8771703014519
## 1layhid.3.to.2layhid2       10.4701990764004      0.9833075664241
## 1layhid.4.to.2layhid2       12.1125267534501      1.8212323108463
## 1layhid.5.to.2layhid2      -22.7270743759009      5.9015423751953
## Intercept.to.2layhid3        4.5227039849232     24.3090451427624
## 1layhid.1.to.2layhid3        4.2786530317601    -76.5817245465422
## 1layhid.2.to.2layhid3      -11.0287715679177    -21.2917157092542
## 1layhid.3.to.2layhid3       84.2131701410790     23.4700538205038
## 1layhid.4.to.2layhid3       86.0920827219798     -9.5871983167005
## 1layhid.5.to.2layhid3      -33.6206194360998     86.3742006261846
## Intercept.to.setosa         14.6491521994665     16.3534495476364
## 2layhid.1.to.setosa         22.0882806727604     20.5447310745536
## 2layhid.2.to.setosa        -84.8638342571312     -0.7515042494741
## 2layhid.3.to.setosa        -85.7080848352985    -86.0115162908429
```

```
## Intercept.to.versicolor    -19.2675710034653   -1.9904206293513
## 2layhid.1.to.versicolor     13.4679129269294   -1.8298470907607
## 2layhid.2.to.versicolor    -28.3394793176963  -54.8967755772736
## 2layhid.3.to.versicolor     22.0778436600813   25.1320377524376
## Intercept.to.virginica      -0.5530993203272   -1.5370133464570
## 2layhid.1.to.virginica     -30.1167779981814  -23.2346053422589
## 2layhid.2.to.virginica      49.0659034210123   56.8204449184572
## 2layhid.3.to.virginica      -0.0667583727972    2.6223699687047
##                                            3                 4
## error                          0.001399199860    0.002305836121
## reached.threshold              0.009763072172    0.008150394874
## steps                        367.000000000000  186.000000000000
## Intercept.to.1layhid1          0.047675062334   -0.529701625227
## Sepal.Length.to.1layhid1       0.925710846993    0.186887317323
## Sepal.Width.to.1layhid1        0.388070500832   -0.616028213985
## Petal.Length.to.1layhid1      -1.014011196638    0.758900523849
## Petal.Width.to.1layhid1       -1.273555971373    3.089905058812
## Intercept.to.1layhid2          0.729245705063   -1.262001638676
## Sepal.Length.to.1layhid2       0.489439250500   -0.511252227853
## Sepal.Width.to.1layhid2       -0.438103043435   -2.005028727541
## Petal.Length.to.1layhid2      -0.522342899645    2.155774497513
## Petal.Width.to.1layhid2       -0.874542715145    0.670540347755
## Intercept.to.1layhid3          0.127230402006   -1.172828620924
## Sepal.Length.to.1layhid3      -0.996262212740    0.009602561267
## Sepal.Width.to.1layhid3       -0.081206911287  -10.084712707462
## Petal.Length.to.1layhid3       0.988941266093    8.909588471609
## Petal.Width.to.1layhid3        0.427186163430   11.759005832925
## Intercept.to.1layhid4         -0.296950033397   -0.282811857716
## Sepal.Length.to.1layhid4       0.335647551733    1.251089373844
## Sepal.Width.to.1layhid4        3.927821722399    0.238316871731
## Petal.Length.to.1layhid4      -2.547668773532   -1.208121776952
## Petal.Width.to.1layhid4       -2.818546573375   -1.756461221433
## Intercept.to.1layhid5          1.517414608899   -0.823948730177
## Sepal.Length.to.1layhid5       0.454597926413    0.488164157046
## Sepal.Width.to.1layhid5        0.128487729457   -0.530339558601
## Petal.Length.to.1layhid5      -0.441535624739    0.490886986223
## Petal.Width.to.1layhid5       -2.093062662111    0.516788551481
## Intercept.to.2layhid1         -1.730045138917   -0.489414664249
## 1layhid.1.to.2layhid1          7.887891023732    0.571566815386
## 1layhid.2.to.2layhid1          2.174867625664    4.721239292031
## 1layhid.3.to.2layhid1          2.203725703880   -1.121004317413
## 1layhid.4.to.2layhid1        -10.751719449242  -10.901699821333
## 1layhid.5.to.2layhid1          3.279062534021    1.314331465877
## Intercept.to.2layhid2          5.100451188348    8.020073312049
## 1layhid.1.to.2layhid2         -9.020166409801  -13.716535395884
## 1layhid.2.to.2layhid2         -4.492852368210  -18.047043036680
## 1layhid.3.to.2layhid2          4.056986866101  -17.022034324597
## 1layhid.4.to.2layhid2        -33.203537882170   15.760940726255
## 1layhid.5.to.2layhid2         -1.511579730433    3.048009738176
## Intercept.to.2layhid3         -3.200755507244    1.365990937720
## 1layhid.1.to.2layhid3         -4.634292787596   -1.334976064432
## 1layhid.2.to.2layhid3         -3.658356091885   -3.411814318328
## 1layhid.3.to.2layhid3         -3.034467107633   -0.197192624764
## 1layhid.4.to.2layhid3         13.472740075614    7.424712017087
```

```
## 1layhid.5.to.2layhid3      -2.273014963982    0.281223829051
## Intercept.to.setosa         0.051554450564   -8.904348810679
## 2layhid.1.to.setosa       -18.335643118877  -18.222428125085
## 2layhid.2.to.setosa       -36.880395335171   17.031722356428
## 2layhid.3.to.setosa        29.958648941860    0.605710466217
## Intercept.to.versicolor    -1.019962082450    0.592496432708
## 2layhid.1.to.versicolor    12.595277607001  -15.779332213925
## 2layhid.2.to.versicolor   -25.358941851531  -17.855663428408
## 2layhid.3.to.versicolor   -18.915510754252   10.941696932403
## Intercept.to.virginica     -1.773274903902    0.647646335325
## 2layhid.1.to.virginica     -9.281363866317   15.281433098384
## 2layhid.2.to.virginica     24.267322792947  -18.804673118883
## 2layhid.3.to.virginica     -4.270714948854  -12.847667841138
##                                           5
## error                       0.001128758554
## reached.threshold           0.009734097988
## steps                     960.000000000000
## Intercept.to.1layhid1      -1.413021562704
## Sepal.Length.to.1layhid1   -0.444204858813
## Sepal.Width.to.1layhid1     0.058228117909
## Petal.Length.to.1layhid1    0.867452559475
## Petal.Width.to.1layhid1    -0.066326329242
## Intercept.to.1layhid2       0.391143032398
## Sepal.Length.to.1layhid2    9.501359183499
## Sepal.Width.to.1layhid2    -2.834489767589
## Petal.Length.to.1layhid2    3.685279023831
## Petal.Width.to.1layhid2     3.317848589982
## Intercept.to.1layhid3       2.497724143584
## Sepal.Length.to.1layhid3    0.229640132911
## Sepal.Width.to.1layhid3     0.398116501391
## Petal.Length.to.1layhid3   -0.729170220169
## Petal.Width.to.1layhid3    -1.020147447599
## Intercept.to.1layhid4       0.159205248710
## Sepal.Length.to.1layhid4    0.095176181930
## Sepal.Width.to.1layhid4     1.942921053718
## Petal.Length.to.1layhid4   -0.834814211315
## Petal.Width.to.1layhid4    -2.557861754563
## Intercept.to.1layhid5       2.039805958621
## Sepal.Length.to.1layhid5   -0.257705221124
## Sepal.Width.to.1layhid5    -0.589374192102
## Petal.Length.to.1layhid5   -0.201163784790
## Petal.Width.to.1layhid5    -0.717704438967
## Intercept.to.2layhid1       2.478954893055
## 1layhid.1.to.2layhid1       5.447419791946
## 1layhid.2.to.2layhid1      -0.783247632445
## 1layhid.3.to.2layhid1      -9.440634277661
## 1layhid.4.to.2layhid1      -5.908753907166
## 1layhid.5.to.2layhid1       6.694417104414
## Intercept.to.2layhid2      -1.055858340871
## 1layhid.1.to.2layhid2      -4.189571932896
## 1layhid.2.to.2layhid2      -0.403485330182
## 1layhid.3.to.2layhid2       7.212114214379
## 1layhid.4.to.2layhid2       4.739341127000
## 1layhid.5.to.2layhid2     -12.614739504106
```

```
## Intercept.to.2layhid3      11.820879958221
## 1layhid.1.to.2layhid3      82.928360104493
## 1layhid.2.to.2layhid3      46.989813751742
## 1layhid.3.to.2layhid3     -20.940557002955
## 1layhid.4.to.2layhid3     -90.232723408534
## 1layhid.5.to.2layhid3     -49.612456039729
## Intercept.to.setosa        1.842672701396
## 2layhid.1.to.setosa       -74.581504737535
## 2layhid.2.to.setosa        34.933077385992
## 2layhid.3.to.setosa       -96.033150964328
## Intercept.to.versicolor    -5.096854252883
## 2layhid.1.to.versicolor   -55.865346081828
## 2layhid.2.to.versicolor    -0.631279703213
## 2layhid.3.to.versicolor    29.434061341863
## Intercept.to.virginica     0.514701725625
## 2layhid.1.to.virginica    66.877202421607
## 2layhid.2.to.virginica   -66.944738750350
## 2layhid.3.to.virginica     0.991481158715
##
## attr(,"class")
## [1] "nn"
```

```r
### Seems setting seed - does not work - keep getting different
# STEPS and ERROR as seen below --

# STEPS == 1614
# ERROR == 0.01052


# STEPS == 1938
# ERROR == 0.003109


# STEPS == 446
# ERROR == 0.00107


# Seen in the PLOT :-
#
# Black lines are connections between each layer,
# Figures seen on connections are weights ,
# The Circles with Figure 1 in them and the blue lines show "bias terms".
#

set.seed(123)
```

```
## ANN - 3
```

```r
nn_iris_2<-neuralnet(setosa + versicolor + virginica ~ Sepal.Length + Sepal.Width + Petal.Length + Peta
trainData[samp,], hidden = c(5,3,3), threshold = 0.01, stepmax = 1e+05, algorithm = "rprop+",
err.fct = "sse", act.fct = "logistic",rep=3 , linear.output = FALSE) ## Added -- rep=="3" , hidden == c

#Plotting the Model
```

```
#
plot(nn_iris_2,col.entry="blue",col.hidden="green",col.out = "red")
nn_iris_2
```

```
## $call
## neuralnet(formula = setosa + versicolor + virginica ~ Sepal.Length +
##     Sepal.Width + Petal.Length + Petal.Width, data = trainData[samp,
##     ], hidden = c(5, 3, 3), threshold = 0.01, stepmax = 100000,
##     rep = 3, algorithm = "rprop+", err.fct = "sse", act.fct = "logistic",
##     linear.output = FALSE)
##
## $response
##     setosa versicolor virginica
## 3        1          0         0
## 43       1          0         0
## 7        1          0         0
## 13       1          0         0
## 47       1          0         0
## 6        1          0         0
## 26       1          0         0
## 49       1          0         0
## 16       1          0         0
## 4        1          0         0
## 35       1          0         0
## 15       1          0         0
## 14       1          0         0
## 11       1          0         0
## 41       1          0         0
## 23       1          0         0
## 46       1          0         0
## 2        1          0         0
## 12       1          0         0
## 19       1          0         0
## 50       1          0         0
## 22       1          0         0
## 17       1          0         0
## 37       1          0         0
## 24       1          0         0
## 79       0          1         0
## 74       0          1         0
## 52       0          1         0
## 99       0          1         0
## 75       0          1         0
## 97       0          1         0
## 95       0          1         0
## 87       0          1         0
## 83       0          1         0
## 81       0          1         0
## 90       0          1         0
## 77       0          1         0
## 89       0          1         0
## 93       0          1         0
## 57       0          1         0
## 69       0          1         0
```

```
## 96         0           1         0
## 68         0           1         0
## 91         0           1         0
## 59         0           1         0
## 56         0           1         0
## 100        0           1         0
## 78         0           1         0
## 72         0           1         0
## 61         0           1         0
## 105        0           0         1
## 111        0           0         1
## 134        0           0         1
## 149        0           0         1
## 132        0           0         1
## 107        0           0         1
## 126        0           0         1
## 123        0           0         1
## 137        0           0         1
## 127        0           0         1
## 119        0           0         1
## 124        0           0         1
## 146        0           0         1
## 121        0           0         1
## 139        0           0         1
## 128        0           0         1
## 140        0           0         1
## 138        0           0         1
## 113        0           0         1
## 112        0           0         1
## 135        0           0         1
## 145        0           0         1
## 142        0           0         1
## 115        0           0         1
## 125        0           0         1
##
## $covariate
##        [,1] [,2] [,3] [,4]
##  [1,]  4.7  3.2  1.3  0.2
##  [2,]  4.4  3.2  1.3  0.2
##  [3,]  4.6  3.4  1.4  0.3
##  [4,]  4.8  3.0  1.4  0.1
##  [5,]  5.1  3.8  1.6  0.2
##  [6,]  5.4  3.9  1.7  0.4
##  [7,]  5.0  3.0  1.6  0.2
##  [8,]  5.3  3.7  1.5  0.2
##  [9,]  5.7  4.4  1.5  0.4
## [10,]  4.6  3.1  1.5  0.2
## [11,]  4.9  3.1  1.5  0.2
## [12,]  5.8  4.0  1.2  0.2
## [13,]  4.3  3.0  1.1  0.1
## [14,]  5.4  3.7  1.5  0.2
## [15,]  5.0  3.5  1.3  0.3
## [16,]  4.6  3.6  1.0  0.2
## [17,]  4.8  3.0  1.4  0.3
```

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```
## [18,]   4.9   3.0   1.4   0.2
## [19,]   4.8   3.4   1.6   0.2
## [20,]   5.7   3.8   1.7   0.3
## [21,]   5.0   3.3   1.4   0.2
## [22,]   5.1   3.7   1.5   0.4
## [23,]   5.4   3.9   1.3   0.4
## [24,]   5.5   3.5   1.3   0.2
## [25,]   5.1   3.3   1.7   0.5
## [26,]   6.0   2.9   4.5   1.5
## [27,]   6.1   2.8   4.7   1.2
## [28,]   6.4   3.2   4.5   1.5
## [29,]   5.1   2.5   3.0   1.1
## [30,]   6.4   2.9   4.3   1.3
## [31,]   5.7   2.9   4.2   1.3
## [32,]   5.6   2.7   4.2   1.3
## [33,]   6.7   3.1   4.7   1.5
## [34,]   5.8   2.7   3.9   1.2
## [35,]   5.5   2.4   3.8   1.1
## [36,]   5.5   2.5   4.0   1.3
## [37,]   6.8   2.8   4.8   1.4
## [38,]   5.6   3.0   4.1   1.3
## [39,]   5.8   2.6   4.0   1.2
## [40,]   6.3   3.3   4.7   1.6
## [41,]   6.2   2.2   4.5   1.5
## [42,]   5.7   3.0   4.2   1.2
## [43,]   5.8   2.7   4.1   1.0
## [44,]   5.5   2.6   4.4   1.2
## [45,]   6.6   2.9   4.6   1.3
## [46,]   5.7   2.8   4.5   1.3
## [47,]   5.7   2.8   4.1   1.3
## [48,]   6.7   3.0   5.0   1.7
## [49,]   6.1   2.8   4.0   1.3
## [50,]   5.0   2.0   3.5   1.0
## [51,]   6.5   3.0   5.8   2.2
## [52,]   6.5   3.2   5.1   2.0
## [53,]   6.3   2.8   5.1   1.5
## [54,]   6.2   3.4   5.4   2.3
## [55,]   7.9   3.8   6.4   2.0
## [56,]   4.9   2.5   4.5   1.7
## [57,]   7.2   3.2   6.0   1.8
## [58,]   7.7   2.8   6.7   2.0
## [59,]   6.3   3.4   5.6   2.4
## [60,]   6.2   2.8   4.8   1.8
## [61,]   7.7   2.6   6.9   2.3
## [62,]   6.3   2.7   4.9   1.8
## [63,]   6.7   3.0   5.2   2.3
## [64,]   6.9   3.2   5.7   2.3
## [65,]   6.0   3.0   4.8   1.8
## [66,]   6.1   3.0   4.9   1.8
## [67,]   6.9   3.1   5.4   2.1
## [68,]   6.4   3.1   5.5   1.8
## [69,]   6.8   3.0   5.5   2.1
## [70,]   6.4   2.7   5.3   1.9
## [71,]   6.1   2.6   5.6   1.4
```

```
## [72,]  6.7  3.3  5.7  2.5
## [73,]  6.9  3.1  5.1  2.3
## [74,]  5.8  2.8  5.1  2.4
## [75,]  6.7  3.3  5.7  2.1
##
## $model.list
## $model.list$response
## [1] "setosa"     "versicolor" "virginica"
##
## $model.list$variables
## [1] "Sepal.Length" "Sepal.Width"  "Petal.Length" "Petal.Width"
##
##
## $err.fct
## function (x, y)
## {
##     1/2 * (y - x)^2
## }
## <bytecode: 0x2964878>
## <environment: 0x3f270d0>
## attr(,"type")
## [1] "sse"
##
## $act.fct
## function (x)
## {
##     1/(1 + exp(-x))
## }
## <bytecode: 0x392d3f8>
## <environment: 0x3f270d0>
## attr(,"type")
## [1] "logistic"
##
## $linear.output
## [1] FALSE
##
## $data
##     Sepal.Length Sepal.Width Petal.Length Petal.Width setosa versicolor
## 3            4.7         3.2          1.3         0.2      1          0
## 43           4.4         3.2          1.3         0.2      1          0
## 7            4.6         3.4          1.4         0.3      1          0
## 13           4.8         3.0          1.4         0.1      1          0
## 47           5.1         3.8          1.6         0.2      1          0
## 6            5.4         3.9          1.7         0.4      1          0
## 26           5.0         3.0          1.6         0.2      1          0
## 49           5.3         3.7          1.5         0.2      1          0
## 16           5.7         4.4          1.5         0.4      1          0
## 4            4.6         3.1          1.5         0.2      1          0
## 35           4.9         3.1          1.5         0.2      1          0
## 15           5.8         4.0          1.2         0.2      1          0
## 14           4.3         3.0          1.1         0.1      1          0
## 11           5.4         3.7          1.5         0.2      1          0
## 41           5.0         3.5          1.3         0.3      1          0
## 23           4.6         3.6          1.0         0.2      1          0
```

```
## 46     4.8     3.0     1.4     0.3     1     0
## 2      4.9     3.0     1.4     0.2     1     0
## 12     4.8     3.4     1.6     0.2     1     0
## 19     5.7     3.8     1.7     0.3     1     0
## 50     5.0     3.3     1.4     0.2     1     0
## 22     5.1     3.7     1.5     0.4     1     0
## 17     5.4     3.9     1.3     0.4     1     0
## 37     5.5     3.5     1.3     0.2     1     0
## 24     5.1     3.3     1.7     0.5     1     0
## 79     6.0     2.9     4.5     1.5     0     1
## 74     6.1     2.8     4.7     1.2     0     1
## 52     6.4     3.2     4.5     1.5     0     1
## 99     5.1     2.5     3.0     1.1     0     1
## 75     6.4     2.9     4.3     1.3     0     1
## 97     5.7     2.9     4.2     1.3     0     1
## 95     5.6     2.7     4.2     1.3     0     1
## 87     6.7     3.1     4.7     1.5     0     1
## 83     5.8     2.7     3.9     1.2     0     1
## 81     5.5     2.4     3.8     1.1     0     1
## 90     5.5     2.5     4.0     1.3     0     1
## 77     6.8     2.8     4.8     1.4     0     1
## 89     5.6     3.0     4.1     1.3     0     1
## 93     5.8     2.6     4.0     1.2     0     1
## 57     6.3     3.3     4.7     1.6     0     1
## 69     6.2     2.2     4.5     1.5     0     1
## 96     5.7     3.0     4.2     1.2     0     1
## 68     5.8     2.7     4.1     1.0     0     1
## 91     5.5     2.6     4.4     1.2     0     1
## 59     6.6     2.9     4.6     1.3     0     1
## 56     5.7     2.8     4.5     1.3     0     1
## 100    5.7     2.8     4.1     1.3     0     1
## 78     6.7     3.0     5.0     1.7     0     1
## 72     6.1     2.8     4.0     1.3     0     1
## 61     5.0     2.0     3.5     1.0     0     1
## 105    6.5     3.0     5.8     2.2     0     0
## 111    6.5     3.2     5.1     2.0     0     0
## 134    6.3     2.8     5.1     1.5     0     0
## 149    6.2     3.4     5.4     2.3     0     0
## 132    7.9     3.8     6.4     2.0     0     0
## 107    4.9     2.5     4.5     1.7     0     0
## 126    7.2     3.2     6.0     1.8     0     0
## 123    7.7     2.8     6.7     2.0     0     0
## 137    6.3     3.4     5.6     2.4     0     0
## 127    6.2     2.8     4.8     1.8     0     0
## 119    7.7     2.6     6.9     2.3     0     0
## 124    6.3     2.7     4.9     1.8     0     0
## 146    6.7     3.0     5.2     2.3     0     0
## 121    6.9     3.2     5.7     2.3     0     0
## 139    6.0     3.0     4.8     1.8     0     0
## 128    6.1     3.0     4.9     1.8     0     0
## 140    6.9     3.1     5.4     2.1     0     0
## 138    6.4     3.1     5.5     1.8     0     0
## 113    6.8     3.0     5.5     2.1     0     0
## 112    6.4     2.7     5.3     1.9     0     0
```

```
## 135          6.1          2.6          5.6          1.4          0          0
## 145          6.7          3.3          5.7          2.5          0          0
## 142          6.9          3.1          5.1          2.3          0          0
## 115          5.8          2.8          5.1          2.4          0          0
## 125          6.7          3.3          5.7          2.1          0          0
##      virginica
## 3         0
## 43        0
## 7         0
## 13        0
## 47        0
## 6         0
## 26        0
## 49        0
## 16        0
## 4         0
## 35        0
## 15        0
## 14        0
## 11        0
## 41        0
## 23        0
## 46        0
## 2         0
## 12        0
## 19        0
## 50        0
## 22        0
## 17        0
## 37        0
## 24        0
## 79        0
## 74        0
## 52        0
## 99        0
## 75        0
## 97        0
## 95        0
## 87        0
## 83        0
## 81        0
## 90        0
## 77        0
## 89        0
## 93        0
## 57        0
## 69        0
## 96        0
## 68        0
## 91        0
## 59        0
## 56        0
## 100       0
## 78        0
```

```
## 72          0
## 61          0
## 105         1
## 111         1
## 134         1
## 149         1
## 132         1
## 107         1
## 126         1
## 123         1
## 137         1
## 127         1
## 119         1
## 124         1
## 146         1
## 121         1
## 139         1
## 128         1
## 140         1
## 138         1
## 113         1
## 112         1
## 135         1
## 145         1
## 142         1
## 115         1
## 125         1
##
## $net.result
## $net.result[[1]]
##                                           [,1]                    [,2]
## 3    0.9999630722088445056172645308834034949541  0.003187347624466567
## 43   0.9999630385051242464911069873778615146875  0.003189009509951741
## 7    0.9999629820238634669848920566437300294637  0.003191793063978804
## 13   0.9999630948961404364183636062080040574073  0.003186228576535307
## 47   0.9999630255251017452167161536635830998420  0.003189649363577184
## 6    0.9999629259595136376859159099694807082414  0.003194554264352940
## 26   0.9999630624353050833974521083291620016098  0.003187829611821238
## 49   0.9999630744679235405669714964460581541061  0.003187236208951986
## 16   0.9999630073252745443568301197956316173076  0.003190546366070471
## 4    0.9999630281324546343668657755188178271055  0.003189520841175758
## 35   0.9999630651636806089044284817646257579326  0.003187695066039852
## 15   0.9999631186465757215486860332021024078130  0.003185056772145904
## 14   0.9999630925489980670661793737963307648897  0.003186344362754312
## 11   0.9999630828858067088660277477174531668424  0.003186821021553643
## 41   0.9999630605475964273409772431477904319763  0.003187922698880066
## 23   0.9999630821391282120558230417373124510049  0.003186857850927888
## 46   0.9999630470007482285765831875323783606290  0.003188590663560238
## 2    0.9999630833420763975638578813232015818357  0.003186798516218760
## 12   0.9999630105837209459451742077362723648548  0.003190385783189217
## 19   0.9999630497312709254131846137170214205980  0.003188456036093150
## 50   0.9999630802514626326527036326297093182802  0.003186950957227441
## 22   0.9999629622505721293634906032821163535118  0.003192767114879244
## 17   0.9999630512078392374775148709886707365512  0.003188383232628170
```

```
## 37   0.999963112986604230059128894936293363357117 0.003185336054574262
## 24   0.999962815833499329976064018410397669351482 0.003199972804978827
## 79   0.000000001323731196261226047409897815245569 0.999978437154012023
## 74   0.000000002604984114585239711494469704456554 0.999985359446470712
## 52   0.000000003308601280255867068783762237750039 0.999987052275463806
## 99   0.000102496951743644834826631184743206404160 0.995367943137067335
## 75   0.000000003435356604330296772673754232325088 0.999987040608332101
## 97   0.000000003306941986839760327616492220008821 0.999987059271790435
## 95   0.000000002780186325277588329317697950497820 0.999985889160421304
## 87   0.000000002937251817639732152515038689851060 0.999986315131855541
## 83   0.000000003688259015054994789117110410539730 0.999986671897169166
## 81   0.000000003395704718093708619496524990337420 0.999987095707400075
## 90   0.000000002580400267815404489248502363876220 0.999985279983505948
## 77   0.000000002048892032788732408423317910093480 0.999983224241114965
## 89   0.000000003570909343658899419333485204916710 0.999986862333256399
## 93   0.000000003344943303443602984184018208973710 0.999987082949103767
## 57   0.000000002830876497306571888812767141211520 0.999986038821045531
## 69   0.000000000000020987038740617296839555624050 0.986268138034832265
## 96   0.000000003782362635152142924922477243811560 0.999986488858118361
## 68   0.000000003996272457213317534185244002484930 0.999986100692579205
## 91   0.000000001713987570008541387922004623476680 0.999981401221457289
## 59   0.000000003174508731306261247431992211114930 0.999986852864414799
## 56   0.000000001978861356524662476069842954027630 0.999982876481644523
## 100  0.000000003285201856498217939207817571921860 0.999987037704089254
## 78   0.000000000000000904073301152130004568215132 0.977186249198271462
## 72   0.000000003591373477571045311109249406492440 0.999986834297707849
## 61   0.000000003343828571756394429840890077706290 0.999987117788397217
## 105  0.000000000000000000000000000000002152408299 0.000000002278827486
## 111  0.000000000000000000000000000000226458498066 0.000000030596536378
## 134  0.000000000000000000022684518963578461737700 0.020185782132772036
## 149  0.000000000000000000000000000000002809556304 0.000000002634189138
## 132  0.000000000000000000000000000000169957559244 0.000000026054918543
## 107  0.000000000000000000000000000000004219846156 0.000000003293069313
## 126  0.000000000000000000000000000000023028876833 0.000000008478707446
## 123  0.000000000000000000000000000000003027743274 0.000000002747858625
## 137  0.000000000000000000000000000000002262977370 0.000000002341425193
## 127  0.000000000000000000000000000009511179070928 0.000000259412175520
## 119  0.000000000000000000000000000000002223358037 0.000000002320129400
## 124  0.000000000000000000000000000000433696336249 0.000000044555051574
## 146  0.000000000000000000000000000000003064393018 0.000000002763488067
## 121  0.000000000000000000000000000000002457820018 0.000000002449383933
## 139  0.000000000000000000000000000261323198492590 0.000001733384073508
## 128  0.000000000000000000000000000014930163124370 0.000000333716470558
## 140  0.000000000000000000000000000006826150264000 0.000000004299346648
## 138  0.000000000000000000000000000009876255839000 0.000000005274296190
## 113  0.000000000000000000000000000003582374087000 0.000000003011409545
## 112  0.000000000000000000000000000004599843988000 0.000000003457499604
## 135  0.000000000000000000000000000027053418704000 0.000000009291221251
## 145  0.000000000000000000000000000002130551585000 0.000000002266113275
## 142  0.000000000000000000000000000006267472721000 0.000000004099740102
## 115  0.000000000000000000000000000002050594633000 0.000000002219647022
## 125  0.000000000000000000000000000003157027814000 0.000000002808277131
##                    [,3]
## 3     0.000004505457583
```

```
## 43  0.000004505438108
## 7   0.000004505405512
## 13  0.000004505470702
## 47  0.000004505430613
## 6   0.000004505373206
## 26  0.000004505451934
## 49  0.000004505458889
## 16  0.000004505420108
## 4   0.000004505432118
## 35  0.000004505453510
## 15  0.000004505484444
## 14  0.000004505469344
## 11  0.000004505463756
## 41  0.000004505450843
## 23  0.000004505463324
## 46  0.000004505443015
## 2   0.000004505464020
## 12  0.000004505421988
## 19  0.000004505444593
## 50  0.000004505462233
## 22  0.000004505394113
## 17  0.000004505445446
## 37  0.000004505481169
## 24  0.000004505309891
## 79  0.000007079883876
## 74  0.000004622105970
## 52  0.000004007451930
## 99  0.000004109889648
## 75  0.000003962770319
## 97  0.000004006922332
## 95  0.000004437539953
## 87  0.000004288463338
## 83  0.000003936486255
## 81  0.000003967846386
## 90  0.000004649826064
## 77  0.000005372296270
## 89  0.000003944869375
## 93  0.000003988689806
## 57  0.000004386324491
## 69  0.008248894477420
## 96  0.000003935199626
## 68  0.000003929278471
## 91  0.000006016230609
## 59  0.000004094054960
## 56  0.000005493833662
## 100 0.000004018886928
## 78  0.014295730419233
## 72  0.000003942506939
## 61  0.000003983245260
## 105 0.999999999603495
## 111 0.999999992905128
## 134 0.983375286073309
## 149 0.999999999533597
## 132 0.999999994063354
```

```
## 107 0.999999999401524
## 126 0.999999998288644
## 123 0.999999999511291
## 137 0.999999999591249
## 127 0.999999925325862
## 119 0.999999999595486
## 124 0.999999989284972
## 146 0.999999999508007
## 121 0.999999999570101
## 139 0.999999396359498
## 128 0.999999901236301
## 140 0.999999999194753
## 138 0.999999998988923
## 113 0.999999999458500
## 112 0.999999999368397
## 135 0.999999998106780
## 145 0.999999999605966
## 142 0.999999999236191
## 115 0.999999999615020
## 125 0.999999999499040
##
## $net.result[[2]]
##                        [,1]              [,2]                              [,3]
## 3    0.9999999761803607390 0.00007402531719 0.000000000000000005939416112
## 43   0.9999999762312540286 0.00007394249290 0.000000000000000005929614004
## 7    0.9999999755883196562 0.00007498631785 0.000000000000000006053355524
## 13   0.9999999767005721685 0.00007316141900 0.000000000000000005838135016
## 47   0.9999999764054215978 0.00007367275529 0.000000000000000005896931793
## 6    0.9999999748741010830 0.00007614113154 0.000000000000000006190618831
## 26   0.9999999758121854709 0.00007454631594 0.000000000000000006005401147
## 49   0.9999999762883656773 0.00007386453102 0.000000000000000005919559060
## 16   0.9999999746789429711 0.00007648681576 0.000000000000000006230074378
## 4    0.9999999761451369151 0.00007405477283 0.000000000000000005944443880
## 35   0.9999999760823184980 0.00007415397314 0.000000000000000005956350864
## 15   0.9999999759282406364 0.00007446335458 0.000000000000000005989753042
## 14   0.9999999766873449714 0.00007319764484 0.000000000000000005841605544
## 11   0.9999999762670782610 0.00007389939754 0.000000000000000005923673685
## 41   0.9999999754739544722 0.00007518473627 0.000000000000000006076183434
## 23   0.9999999760497743084 0.00007426119432 0.000000000000000005966055246
## 46   0.9999999749597745513 0.00007590772567 0.000000000000000006168070433
## 2    0.9999999759995953363 0.00007428428327 0.000000000000000005972010723
## 12   0.9999999763421522081 0.00007375740653 0.000000000000000005907964114
## 19   0.9999999756401575235 0.00007491017338 0.000000000000000006043884884
## 50   0.9999999761980028490 0.00007399735062 0.000000000000000005936065155
## 22   0.9999999747239336489 0.00007638052225 0.000000000000000006219272851
## 17   0.9999999745011578511 0.00007676300113 0.000000000000000006263545246
## 37   0.9999999760819456851 0.00007420110757 0.000000000000000005959365208
## 24   0.9999999698913597523 0.00008324189019 0.000000000000000007088040456
## 79   0.0000000008483667516 0.99988402199262 0.00003751642187099131779855 2
## 74   0.0000000008783680911 0.99992099466079 0.00002455358392242205255911 0
## 52   0.0000000008954119513 0.99993111647427 0.00002099120831611114932485 6
## 99   0.0000001665437432905 0.99928478115040 0.00000481120990041572854320
## 75   0.0000000009551689524 0.99993087414983 0.00001980408588743653536213 8
## 97   0.0000000008902378061 0.99993074594147 0.00002120531711821797431248 9
```

```
## 95  0.0000000008817518769 0.99992428152426 0.00002342806419676730038781
## 87  0.0000000008875021732 0.99992916160849 0.00002175929727443698285843
## 83  0.0000000009850449219 0.99993024439272 0.00001934956399504823867343
## 81  0.0000000008934451864 0.99993203271435 0.00002073327535526790364912
## 90  0.0000000008825505869 0.99992504122148 0.00002316873533092108462328
## 77  0.0000000008797733605 0.99992238111651 0.00002407826298451924126658
## 89  0.0000000009072128504 0.99993157253500 0.00002060563687819969380210
## 93  0.0000000008948912028 0.99993189133163 0.00002074937500120038784889
## 57  0.0000000008771636517 0.99991977493027 0.00002497232490366266350538
## 69  0.0000000006141071731 0.99589284465646 0.00193154076613912721940846
## 96  0.0000000009597281654 0.99993070373291 0.00001977782894796487370928
## 68  0.0000000011916461459 0.99992502778085 0.00001701258616102026066186
## 91  0.0000000008462679286 0.99988080396116 0.00003866759837954990384079
## 59  0.0000000008929046400 0.99993127499066 0.00002098564857629997958284
## 56  0.0000000008536681444 0.99989173649988 0.00003477045511625370547217
## 100 0.0000000008904590665 0.99993100571535 0.00002111866250743520676859
## 78  0.0000000005267959402 0.97803629913092 0.01241744122870623752430407
## 72  0.0000000010009920177 0.99992987385733 0.00001915889901807897406833
## 61  0.0000000008896858382 0.99993137776065 0.00002101482514232168690424
## 105 0.0000000001704061093 0.00017053079111 0.99991695611216935279941253
## 111 0.0000000001854323046 0.00043377656999 0.99976714732440374877597832
## 134 0.0000000002654454399 0.02235042752070 0.98179271688054647881926939
## 149 0.0000000001705586966 0.00017222560329 0.99991604423462954187584728
## 132 0.0000000001753292704 0.00023359808859 0.99988244800847292381718034
## 107 0.0000000001736913291 0.00021058714639 0.99989516792637311848324088
## 126 0.0000000001732767925 0.00020510020849 0.99989818016967602076761068
## 123 0.0000000001708384582 0.00017537279949 0.99991434843609561244903716
## 137 0.0000000001702575890 0.00016889572970 0.99991783494543862165215841
## 127 0.0000000002154638429 0.00227444407689 0.99854779743113719625569046
## 119 0.0000000001705994797 0.00017268117381 0.99991579895910964737026915
## 124 0.0000000001961655682 0.00080753886949 0.99953742592173444592162923
## 146 0.0000000001726689855 0.00019728989221 0.99990245336845473556053320
## 121 0.0000000001707596227 0.00017448068493 0.99991482945784371239028587
## 139 0.0000000002093229717 0.00165337487642 0.99897910668327971617230787
## 128 0.0000000001980380384 0.00089684955489 0.99948059926929033736087149
## 140 0.0000000001744446980 0.00022090187591 0.99988948323427850883859946
## 138 0.0000000001729480335 0.00020084143791 0.99990051238668797850550618
## 113 0.0000000001720133069 0.00018916846038 0.99990687808036515793475018
## 112 0.0000000001730496044 0.00020214853168 0.99989979713113563697390873
## 135 0.0000000001748914473 0.00022723340614 0.99988597993781469508434156
## 145 0.0000000001703575748 0.00016999489811 0.99991724424795491721340567
## 142 0.0000000001792363218 0.00029800112458 0.99984618003734471169963171
## 115 0.0000000001705963053 0.00017264567536 0.99991581807362017730866909
## 125 0.0000000001709284892 0.00017639667626 0.99991379605431041088792198
##
## $net.result[[3]]
##                 [,1]               [,2]               [,3]
## 3   0.99949904770031 0.002128712823980 0.00265138398337
## 43  0.99949902402256 0.002121936905972 0.00265934122857
## 7   0.99949902834222 0.002121617869066 0.00265969767866
## 13  0.99949905387560 0.002130195195619 0.00264964606879
## 47  0.99949904991378 0.002130603888772 0.00264918776658
## 6   0.99949906248667 0.002129528085465 0.00265038765016
## 26  0.99949905541611 0.002128018499144 0.00265216115573
```

```
## 49   0.99949905971479 0.002134184564370 0.00264501939437
## 16   0.99949906571150 0.002135707467492 0.00264324424107
## 4    0.99949902969374 0.002121314757215 0.00266004620276
## 35   0.99949905449684 0.002128088584492 0.00265208294261
## 15   0.99949905902322 0.002139446538364 0.00263897214764
## 14   0.99949903390192 0.002127407366222 0.00265294632749
## 11   0.99949906235723 0.002135026957768 0.00264403950833
## 41   0.99949905758808 0.002131693065194 0.00264790160611
## 23   0.99949904054691 0.002133037521054 0.00264641060366
## 46   0.99949904909761 0.002126080535271 0.00265443180038
## 2    0.99949905939594 0.002129728083677 0.00265016682140
## 12   0.99949903754608 0.002124229856603 0.00265662333268
## 19   0.99949907292520 0.002134163530346 0.00264499670948
## 50   0.99949905808776 0.002131612104544 0.00264799328230
## 22   0.99949905550658 0.002128113970864 0.00265205013511
## 17   0.99949906613200 0.002134764996315 0.00264432783250
## 37   0.99949906632127 0.002137062865937 0.00264168300406
## 24   0.99949890129181 0.002132931824052 0.00264704005085
## 79   0.00009410934860 0.999422457340304 0.00054509869202
## 74   0.00042062892856 0.999843610778230 0.00008717661357
## 52   0.00059609067871 0.999886051712780 0.00005675667157
## 99   0.00074111979634 0.999907625791720 0.00004308418007
## 75   0.00074343890128 0.999902743866392 0.00004480893327
## 97   0.00045473773210 0.999866789997869 0.00007366306935
## 95   0.00026731862523 0.999797833880915 0.00013491802274
## 87   0.00063448791695 0.999885756165963 0.00005512550616
## 83   0.00072686430826 0.999902007586729 0.00004558746523
## 81   0.00070252950365 0.999897043998329 0.00004822388215
## 90   0.00031942156779 0.999817942190170 0.00011325033767
## 77   0.00067169377677 0.999883365393735 0.00005446855566
## 89   0.00049298281029 0.999877250990464 0.00006624501362
## 93   0.00070125631220 0.999896820713156 0.00004835076930
## 57   0.00015891566314 0.999704789764969 0.00023939707258
## 69   0.00003750104277 0.993104142835500 0.00705910746071
## 96   0.00059517642681 0.999889550830526 0.00005540355986
## 68   0.00073566750746 0.999903203496585 0.00004487533704
## 91   0.00008438406616 0.999310780137533 0.00066793262947
## 59   0.00073373679350 0.999898273070026 0.00004674075417
## 56   0.00008901299432 0.999395384949617 0.00058266927685
## 100  0.00052650470354 0.999877118638491 0.00006415331066
## 78   0.00002323084946 0.987262377670144 0.01523323178805
## 72   0.00073885512995 0.999903250409330 0.00004476170257
## 61   0.00064163871547 0.999887753758475 0.00005405133286
## 105  0.00034651343763 0.000004884717803 0.99946575929941
## 111  0.00020662469692 0.000009790591515 0.99935120692305
## 134  0.00001279910936 0.008263695759717 0.97779086538473
## 149  0.00034199954650 0.000004958198535 0.99946415115222
## 132  0.00012379554746 0.000022243691689 0.99912855687505
## 107  0.00033211426393 0.000005148649262 0.99945904920392
## 126  0.00024039604162 0.000008158751463 0.99937927510274
## 123  0.00034398512488 0.000004941365652 0.99946378682230
## 137  0.00034589508682 0.000004890414043 0.99946583226256
## 127  0.00009626858808 0.000032158782841 0.99901186328355
## 119  0.00034926017822 0.000004839542966 0.99946682318022
```

```
## 124 0.00015013163191 0.000016173489398 0.99922671407347
## 146 0.00033032848369 0.000005201770517 0.99945695312838
## 121 0.00034087366808 0.000004990075523 0.99946284730143
## 139 0.00013235214982 0.000018542548432 0.99920456128368
## 128 0.00014994559065 0.000015531649327 0.99924842193963
## 140 0.00028821771985 0.000006261338780 0.99942825066712
## 138 0.00029799918536 0.000005968106561 0.99943642331829
## 113 0.00032616303685 0.000005297300833 0.99945404819300
## 112 0.00032449071241 0.000005337888196 0.99945277341662
## 135 0.00030029831358 0.000005954669143 0.99943508837948
## 145 0.00034643648627 0.000004883815694 0.99946587892146
## 142 0.00028038165319 0.000006485394599 0.99942305062605
## 115 0.00034783857104 0.000004858752955 0.99946655465995
## 125 0.00033338276000 0.000005134752427 0.99945896498724
##
##
## $weights
## $weights[[1]]
## $weights[[1]][[1]]
##               [,1]          [,2]          [,3]          [,4]          [,5]
## [1,] -1.2105118255  2.0419777239  1.1765978267  0.7595847624  0.4706146140
## [2,] -0.8507532835  0.7990871234  0.1457271368  0.5442506527  0.5276668301
## [3,]  0.9383179673 -0.3155146297  1.4405709993 -3.4820107954  0.5043242263
## [4,]  0.3661865846 -1.6254000378 -0.8046004024  1.2679267439 -0.8047706489
## [5,]  1.1298860300 -2.5463485061 -2.2276217010  0.6821148643 -0.9849615921
##
## $weights[[1]][[2]]
##              [,1]         [,2]         [,3]
## [1,]  -1.691453250 -1.1883087121 -0.1896266939
## [2,]   5.181942472 -0.9610116476 -1.5755191823
## [3,] -15.501857507 13.6405618714  6.0596883908
## [4,]  -4.122477329  1.8191985196  0.5954293508
## [5,]   2.903852956 -1.1107491077 -2.3692217174
## [6,]  -5.312889523  2.1422344604  1.7962147245
##
## $weights[[1]][[3]]
##               [,1]         [,2]         [,3]
## [1,]  14.184476429 -0.9626238115 -1.558495460
## [2,]  29.776361998  6.9115480600  8.612147060
## [3,]  -5.317861847 -7.6321396477 -6.601292355
## [4,] -13.156711255 -6.6487862620 -8.260105240
##
## $weights[[1]][[4]]
##              [,1]         [,2]         [,3]
## [1,]  10.61730937  -5.980838229 -12.3082726222
## [2,] -30.11715280  17.263399554  -0.1429023194
## [3,] -27.65218625 -13.627879405  15.8238039924
## [4,] -26.07857075 -17.723798977  18.4662248551
##
##
## $weights[[2]]
## $weights[[2]][[1]]
##                 [,1]          [,2]         [,3]          [,4]
## [1,] -1.693843367111  1.66908303917  0.09866824305 -0.5880508731
```

```
## [2,]  -0.216926888892  -0.08202338971   0.51606197091   0.4129505835
## [3,]   2.418885428325  -0.02423347755   1.68900770734  -3.4088888748
## [4,]   0.005557968157   0.30987014402  -1.43702137979   2.8221965406
## [5,]  -2.035504458888  -1.99271529167  -1.23003970424   7.3878100933
##                 [,5]
## [1,] -0.7664246856
## [2,] -1.1884149700
## [3,] -0.7815547104
## [4,]  1.5130150488
## [5,]  1.8830924860
##
## $weights[[2]][[2]]
##                [,1]          [,2]          [,3]
## [1,] -0.1131579344   0.1133904782  -0.4025374941
## [2,] -1.0748713395  -2.3627523752   1.9032205210
## [3,] -1.1412128834   2.3219825931  -3.1718891949
## [4,] -4.6459881039   6.0665501458  -5.1015611899
## [5,]  3.2250993952  -0.4807378406   0.5423812596
## [6,]  3.1745961102  -1.9345838016   2.7905277709
##
## $weights[[2]][[3]]
##                [,1]          [,2]          [,3]
## [1,] -0.2748685055    1.305106532  -0.04529930594
## [2,] 20.9454076250  -22.348123758  -1.02110760426
## [3,] -1.9471592832    1.147561370   8.70734123721
## [4,] 14.7068588765  -23.289983128  -5.98824659309
##
## $weights[[2]][[4]]
##                [,1]          [,2]          [,3]
## [1,]  -1.693064344   -9.2002371916   1.448979060
## [2,] -20.805081868    0.4651365892   8.011869735
## [3,]  21.608579554  -20.4671089420  -23.727167078
## [4,]   1.660630902   18.3517836090  -20.264030230
##
##
## $weights[[3]]
## $weights[[3]][[1]]
##                [,1]             [,2]           [,3]           [,4]
## [1,] -1.9129960792  -0.8669593332518  -1.5409306998  -1.3648663197
## [2,]  0.3015053438   1.2789987453658  -0.4089830572   0.5961478045
## [3,] -0.4480338833   0.0008587208374  -1.3352469194   6.6376826700
## [4,]  0.5982346191  -1.2855902764886   0.9132260949  -7.9098263418
## [5,]  1.8310308729  -1.2223983518142   2.3353614061  -14.1819766083
##                 [,5]
## [1,]  0.81928497738
## [2,]  0.08188806287
## [3,]  1.37038790187
## [4,] -0.91655857840
## [5,] -1.12853296701
##
## $weights[[3]][[2]]
##                [,1]          [,2]          [,3]
## [1,] -1.1179306666  -1.5777424383   3.795394271
## [2,]  0.7506735796   0.1087198834   6.339058675
```

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```
## [3,]  -4.5286541267 -10.5626426163  -1.822270981
## [4,]   1.7712984741   5.5714251961   8.668201804
## [5,]  15.2407033338   3.6367082494 -14.852636696
## [6,]  -2.5272906070   0.1863357098  -2.114348016
##
## $weights[[3]][[3]]
##                [,1]           [,2]           [,3]
## [1,]  0.3107678036    2.6714018644 -3.8744802213
## [2,]  2.4041609088   -2.4848599348 -0.7792170312
## [3,]  7.5342224260  -12.5034462607  8.5293253561
## [4,] -3.3856968994    0.7210535221  3.1322484882
##
## $weights[[3]][[4]]
##                [,1]           [,2]           [,3]
## [1,]  -4.280889119  -1.1042479508  -1.131743179
## [2,]  11.889458986 -11.8374676087   1.601564523
## [3,]   1.602595787  11.0898218078 -11.669567153
## [4,] -15.552672750   0.6726626684   7.077877631
##
##
##
## $startweights
## $startweights[[1]]
## $startweights[[1]][[1]]
##                 [,1]           [,2]           [,3]           [,4]
## [1,] -0.56047564655  1.7150649869   1.2240817974   1.7869131368
## [2,] -0.23017748948  0.4609162060   0.3598138271   0.4978504782
## [3,]  1.55870831415 -1.2650612346   0.4007714506  -1.9666171566
## [4,]  0.07050839142 -0.6868528519   0.1106827159   0.7013559016
## [5,]  0.12928773516 -0.4456619701  -0.5558411348  -0.4727914077
##                 [,5]
## [1,] -1.0678237060
## [2,] -0.2179749147
## [3,] -1.0260044483
## [4,] -0.7288912293
## [5,] -0.6250392678
##
## $startweights[[1]][[2]]
##                 [,1]           [,2]           [,3]
## [1,] -1.6866933107  -0.2950714830 -0.06191171058
## [2,]  0.8377870445   0.8951256610 -0.30596266374
## [3,]  0.1533731178   0.8781334875 -0.38047100101
## [4,] -1.1381369370   0.8215810816 -0.69470697892
## [5,]  1.2538149211   0.6886402541 -0.20791727802
## [6,]  0.4264642215   0.5539176535 -1.26539635157
##
## $startweights[[1]][[3]]
##                 [,1]           [,2]           [,3]
## [1,]  2.1689559653 -0.46665535362 -0.02854675535
## [2,]  1.2079619983  0.77996511834 -0.04287045729
## [3,] -1.1231085832 -0.08336906647  1.36860228401
## [4,] -0.4028848353  0.25331851399 -0.22577098566
##
## $startweights[[1]][[4]]
```

```
##                [,1]          [,2]          [,3]
## [1,]   1.5164706044   0.2159415687  -1.0185753831
## [2,]  -1.5487528042   0.3796394828  -1.0717912265
## [3,]   0.5846137496  -0.5023234531   0.3035286414
## [4,]   0.1238542438  -0.3332073837   0.4482097786
##
##
## $startweights[[2]]
## $startweights[[2]][[1]]
##                 [,1]          [,2]          [,3]          [,4]
## [1,]   0.05300422673   1.0057385245  -1.2207177123  -0.3706600318
## [2,]   0.92226746788  -0.7092007626   0.1813034797   0.6443765485
## [3,]   2.05008468563  -0.6880086165  -0.1388913624  -0.2204865618
## [4,]  -0.49103116606   1.0255713697   0.0057641859   0.3317819639
## [5,]  -2.30916887564  -0.2847730071   0.3852804011   1.0968390131
##                 [,5]
## [1,]   0.4351814908
## [2,]  -0.3259315855
## [3,]   1.1488076185
## [4,]   0.9935038560
## [5,]   0.5483969595
##
## $startweights[[2]][[2]]
##                 [,1]          [,2]          [,3]
## [1,]   0.2387317351  -0.2357003591  -0.95161856727
## [2,]  -0.6279060760  -1.0264209003  -0.04502772481
## [3,]   1.3606524485  -0.7104065637  -0.78490446946
## [4,]  -0.6002595871   0.2568837092  -1.66794193659
## [5,]   2.1873329930  -0.2466918785  -0.38022652029
## [6,]   1.5326106262  -0.3475425994   0.91899660906
##
## $startweights[[2]][[3]]
##                 [,1]          [,2]          [,3]
## [1,]  -0.57534696261   0.5194072039  -0.8497043460
## [2,]   0.60796432223   0.3011533622  -1.0241287906
## [3,]  -1.61788270829   0.1056761941   0.1176465971
## [4,]  -0.05556196552  -0.6407060083  -0.9474746142
##
## $startweights[[2]][[4]]
##                 [,1]          [,2]          [,3]
## [1,]  -0.4905574437   0.23538657228   1.44455085842
## [2,]  -0.2560921922   0.07796084956   0.45150405308
## [3,]   1.8438620052  -0.96185663413   0.04123292199
## [4,]  -0.6519499017  -0.07130808612  -0.42249683234
##
##
## $startweights[[3]]
## $startweights[[3]][[1]]
##                 [,1]          [,2]          [,3]          [,4]          [,5]
## [1,]  -2.0532472215  -1.4438931610  -1.6015361736  -1.2870304760  -0.1194526066
## [2,]   1.1313372134   0.7017843354  -0.5309065222   0.7877388475  -0.2803953352
## [3,]  -1.4606400709  -0.2621974894  -1.4617555850   0.7690422410   0.5629895332
## [4,]   0.7399475109  -1.5721441591   0.6879167730   0.3322025790  -0.3724387561
## [5,]   1.9091035692  -1.5146676538   2.1001089405  -1.0083766083   0.9769733867
```

```
##
## $startweights[[3]][[2]]
##                [,1]          [,2]          [,3]
## [1,] -0.3745808578  0.2982275915  0.06529303353
## [2,]  1.0527114656  0.6365696740 -0.03406725374
## [3,] -1.0491770067 -0.4837806257  2.12845189902
## [4,] -1.2601552448  0.5168620443 -0.74133609627
## [5,]  3.2410399349  0.3689645274 -1.09599626707
## [6,] -0.4168575882 -0.2153805076  0.03778839917
##
## $startweights[[3]][[3]]
##                [,1]          [,2]          [,3]
## [1,]  0.3104807494  1.2631851761 -0.1971758943
## [2,]  0.4365234789 -0.3496503880  1.1099202897
## [3,] -0.4583653327 -0.8655128627  0.0847372922
## [4,] -1.0633261340 -0.2362795689  0.7540537852
##
## $startweights[[3]][[4]]
##                [,1]          [,2]          [,3]
## [1,] -0.49929201717 -0.8953633580 -1.2512713616
## [2,]  0.21444530958 -1.3108015333 -0.6111659167
## [3,] -0.32468591149  1.9972133847 -1.1854800846
## [4,]  0.09458352817  0.6007088237  2.1988103489
##
##
##
## $generalized.weights
## $generalized.weights[[1]]
##                 [,1]            [,2]            [,3]            [,4]
## 3     0.0024806658235 -0.0012500064041 -0.003869301502 -0.006466355329
## 43    0.0036946113455 -0.0018838978927 -0.005781933910 -0.009656242129
## 7     0.0059060569888 -0.0030314242531 -0.009468555433 -0.015733054175
## 13    0.0016868490772 -0.0007240693381 -0.002710001986 -0.004470062206
## 47    0.0042155221795 -0.0023112878546 -0.006613260993 -0.011080667348
## 6     0.0082465572228 -0.0042992090408 -0.013574242750 -0.022444804301
## 26    0.0027685116238 -0.0010498282797 -0.004745225882 -0.007691232469
## 49    0.0024278654097 -0.0013403196223 -0.003740314923 -0.006297724125
## 16    0.0048841961993 -0.0028509629198 -0.007525325645 -0.012717796500
## 4     0.0040781105272 -0.0018644720033 -0.006697670880 -0.011014989530
## 35    0.0027105617869 -0.0011930114817 -0.004471003057 -0.007339372436
## 15    0.0009887679987 -0.0006376801576 -0.001338636172 -0.002353504213
## 14    0.0017709272778 -0.0009038451090 -0.002628926987 -0.004446487367
## 11    0.0021392853171 -0.0011802516312 -0.003290490821 -0.005542706181
## 41    0.0029101756313 -0.0015702006340 -0.004507194103 -0.007571952953
## 23    0.0021120145420 -0.0013014154139 -0.002936118647 -0.005105582447
## 46    0.0033480967123 -0.0014073750989 -0.005601871061 -0.009158858600
## 2     0.0020655615766 -0.0008577472553 -0.003400825652 -0.005576361531
## 12    0.0047876640276 -0.0023930954191 -0.007764224805 -0.012849241607
## 19    0.0033281795264 -0.0017363370147 -0.005404869178 -0.008965693856
## 50    0.0022112002984 -0.0011116804768 -0.003481057249 -0.005805229605
## 22    0.0067296358683 -0.0035239125595 -0.010910902980 -0.018107256744
## 17    0.0032509421993 -0.0018575531715 -0.004975829695 -0.008411576601
## 37    0.0011559800781 -0.0006319832661 -0.001727950640 -0.002930964988
## 24    0.0128838295791 -0.0057005099972 -0.022325504748 -0.036286439865
```

```
## 79    2.6892811441827   7.3849181752907   -6.658785137460  -10.320770663727
## 74    0.6009171136898   1.6145035932734   -1.513003075534   -2.384032551669
## 52    0.1048809687359   0.4236958608711   -0.334618805990   -0.486261844506
## 99   16.1987934894393  40.0008282072211  -50.295827556146  -69.388335546383
## 75    0.1056432495723   0.4370225758739   -0.362866794957   -0.514703910251
## 97    0.1077210271073   0.4070260664340   -0.337721176512   -0.492136751361
## 95    0.4717537678816   1.4406693909714   -1.293538708651   -1.968424554940
## 87    0.2898287687465   1.0428444898846   -0.856748909387   -1.277978721408
## 83    0.2347460776926   0.9296400179244   -0.816532367914   -1.133607278292
## 81    0.1155200126800   0.2988178787028   -0.325201786084   -0.483073447336
## 90    0.7027302944307   1.7341087717684   -1.747973941101   -2.727597354291
## 77    1.1849017985107   2.3512016778788   -2.530665013838   -4.161056781443
## 89    0.2012680233494   0.7227310990533   -0.609830234783   -0.879849136486
## 93    0.1041627259059   0.3260994309034   -0.311540234036   -0.458957531672
## 57    0.4283371070180   1.5275516518762   -1.231310883687   -1.841502770762
## 69   36.5889648373921  22.9144871029167  -51.525283714778  -91.321728666910
## 96    0.2995300614982   1.1820643423392   -0.977674876740   -1.371719824714
## 68    0.3818673909761   1.5221073190964   -1.366936954389   -1.865674325823
## 91    1.9286148283636   4.4690478390411   -4.469321986665   -7.181129120493
## 59    0.1426208625566   0.4732242991832   -0.417569919011   -0.630238306624
## 56    1.4358185307804   4.0477358280925   -3.651875205212   -5.689636882578
## 100   0.1120101039330   0.4116774186282   -0.350079260367   -0.511143166572
## 78   38.7901942163625  60.5364772380384  -70.603828129398 -116.119325825976
## 72    0.1760320187559   0.7350309385950   -0.621489078197   -0.865491829624
## 61    0.1312436177953   0.1851908070575   -0.303448368938   -0.477109477830
## 105   0.2050499031151   0.0982602717952   -0.257104989854   -0.429866618881
## 111  12.5262985597859  24.4840185183957  -25.214234753018  -38.254853456652
## 134  56.0344897180010  64.5920459334296  -90.141117024418 -156.683590345378
## 149   0.3682426650968   1.5303557572285   -1.162588458183   -1.487313672162
## 132  12.4763128477713  19.6694865562610  -22.560635240182  -35.639769629640
## 107   1.5567420218580   2.3010484401455   -2.767639137442   -4.437702621769
## 126   7.3016580976209   4.8237573778629   -9.781503928287  -17.165296051929
## 123   0.9804831936801  -0.2518264589778   -0.856367423070   -1.661777606747
## 137   0.1477698531049   0.5774449153208   -0.448203611224   -0.565377329947
## 127  26.2406204742341  30.2353006982237  -42.202109252034  -69.943471879144
## 119   0.2876487692471  -0.1491440331297   -0.212486992324   -0.441970656258
## 124  17.3469256226393  12.7998389337000  -24.200279682594  -41.684838400498
## 146   0.9162308851698   0.6968382780496   -1.285189350568   -2.051595404052
## 121   0.4214491745944   0.3521637640188   -0.606455192762   -0.958591558496
## 139  31.4952631893140  64.7639298323952  -65.148064411243 -101.146922711310
## 128  25.0986269024340  46.2642797633471  -49.131200066158  -77.286959922032
## 140   3.1377449603873   2.6296774421396   -4.514357275970   -7.385884618924
## 138   4.0252954340112   5.1726906802088   -6.692865951528  -10.951596870509
## 113   1.3743574015303   0.7419565366925   -1.766208634483   -2.984149498999
## 112   2.1627412350488   0.7016161387455   -2.542910430820   -4.527044348841
## 135   8.0561043765862   3.4300793663146   -9.857769327498  -18.603157017160
## 145   0.1433827590605   0.2367966632570   -0.267434897797   -0.377376852618
## 142   2.7594074991751   2.8192757685201   -4.243144057955   -6.616750803512
## 115   0.1123016080070   0.1206646269292   -0.176060152249   -0.263955946718
## 125   0.8509664762644   1.2903719213611   -1.519914399358   -2.316063534885
##                [,5]             [,6]             [,7]             [,8]
## 3    -0.0014219067133   0.0007164981619   0.0022178665559   0.003706486359
## 43   -0.0021177349743   0.0010798419903   0.0033141790777   0.005534915507
## 7    -0.0033853259909   0.0017375991087   0.0054273344700   0.009018117699
```

```
## 13   -0.0009668944416    0.0004150333477    0.0015533611675    0.002562219912
## 47   -0.0024163187890    0.0013248200469    0.0037906921272    0.006351389816
## 6    -0.0047268905961    0.0024642878667    0.0077806966424    0.012865263788
## 26   -0.0015868986610    0.0006017569436    0.0027199425556    0.004408580546
## 49   -0.0013916417471    0.0007682652997    0.0021439320148    0.003609827691
## 16   -0.0027995998305    0.0016341594429    0.0043134836237    0.007289785131
## 4    -0.0023375550264    0.0010687071592    0.0038390754933    0.006313743561
## 35   -0.0015536820692    0.0006838289246    0.0025627592396    0.004206895923
## 15   -0.0005667574441    0.0003655154470    0.0007673003319    0.001349018204
## 14   -0.0010150876980    0.0005180800278    0.0015068893401    0.002548706925
## 11   -0.0012262289047    0.0006765150294    0.0018860948151    0.003177054721
## 41   -0.0016680998523    0.0009000320895    0.0025835037977    0.004340210068
## 23   -0.0012105974210    0.0007459655777    0.0016829702546    0.002926497336
## 46   -0.0019191142963    0.0008067012129    0.0032109678228    0.005249817419
## 2    -0.0011839707804    0.0004916569424    0.0019493382519    0.003196345816
## 12   -0.0027442679998    0.0013717117925    0.0044504195531    0.007365128854
## 19   -0.0019076978500    0.0009952607350    0.0030980472049    0.005139096229
## 50   -0.0012674502561    0.0006372103467    0.0019953266530    0.003327531993
## 22   -0.0038573978318    0.0020198912693    0.0062540818168    0.010379000299
## 17   -0.0018634257583    0.0010647413049    0.0028521236688    0.004821478670
## 37   -0.0006626026697    0.0003622500147    0.0009904536646    0.001680016169
## 24   -0.0073849552239    0.0032675076233    0.0127968823972    0.020799229824
## 79    1.5503158234069    4.2522580055983   -3.8354570871946   -5.943172185121
## 74    0.3398448155930    0.9137896003701   -0.8558817529352   -1.347592478271
## 52    0.0164560096257    0.0778382195179   -0.0592299721451   -0.085574594545
## 99   -9.2848714999424  -22.9279627428579   28.8287897804945   39.772263615691
## 75   -0.0233922958628   -0.1005686735617    0.0809721553181    0.111893385528
## 97    0.0195932818290    0.0821707529964   -0.0669719889040   -0.097343193572
## 95    0.2648375816763    0.8105166990949   -0.7270067122834   -1.105274139839
## 87    0.1582943950858    0.5727456878008   -0.4696740651713   -0.699562017782
## 83   -0.1163921327464   -0.4672194875508    0.4072201659704    0.562786452556
## 81   -0.0105519418655   -0.0324081522781    0.0300917583746    0.042394378843
## 90    0.3983833284641    0.9840340933461   -0.9911008148715   -1.545551233363
## 77    0.6757489723292    1.3396954104057   -1.4421886866610   -2.370406214844
## 89   -0.0895162104197   -0.3192963476459    0.2691444306882    0.386907945118
## 93    0.0089049224206    0.0262220301888   -0.0277474900686   -0.042527645155
## 57    0.2396806551220    0.8564581105133   -0.6898794978301   -1.030735483144
## 69   21.6363386635429   13.5065556395668  -30.4359562794388  -53.955574791564
## 96   -0.1558725783337   -0.6166507164246    0.5089224986597    0.712292041728
## 68   -0.2081895031020   -0.8353476295103    0.7476711267323    1.018554872822
## 91    1.1084079200164    2.5661381896962   -2.5665617203408   -4.122592385036
## 59    0.0652082474443    0.2195168018815   -0.1932165008245   -0.291351537231
## 56    0.8229284683825    2.3183398884080   -2.0917722295016   -3.257638045956
## 100   0.0289127388654    0.1124734409681   -0.0949920029480   -0.138516514684
## 78   23.0016435456305   35.8184037623845  -41.8232042212505  -68.791677745905
## 72   -0.0786010894760   -0.3343286871910    0.2796280111510    0.386533616808
## 61    0.0177235181794    0.0219463026689   -0.0421735491816   -0.067028192306
## 105   0.1114435900167    0.0530776194833   -0.1395661081528   -0.233440234178
## 111   7.0964567073325   13.8428172594220  -14.2698785169285  -21.653109715485
## 134  33.1619669649228   38.1285218738271  -53.2921321126522  -92.645820351338
## 149   0.2011702899334    0.8353050669657   -0.6347526535224   -0.811967810532
## 132   7.0644604117369   11.1115867963389  -12.7613108074415  -20.162766181667
## 107   0.8575482189096    1.2643313571377   -1.5228348862165   -2.442114783602
## 126   4.0975665873390    2.6963041771874   -5.4836613468679   -9.625508780003
```

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```
## 123  0.5399081132778  -0.1395446041413  -0.4711030299203  -0.914631270120
## 137  0.0802805163594   0.3135421961109  -0.2434144979327  -0.307011523343
## 127 15.0811519341231  17.3323114783942 -24.2301809324817 -40.165339511929
## 119  0.1570823262452  -0.0816754974571  -0.1159160495362  -0.241265438289
## 124  9.8779873463942   7.2640137905961 -13.7669221367729 -23.719080531298
## 146  0.5027400420716   0.3809115614003  -0.7044287241857  -1.124892652521
## 121  0.2299912347961   0.1914695528388  -0.3305827169061  -0.522707687275
## 139 18.2258081582818  37.4052353741341 -37.6615115912816 -58.477968751232
## 128 14.4246913276058  26.5340496648107 -28.2075158384776 -44.377884895156
## 140  1.7417417210293   1.4547734618663  -2.5033000287975  -4.096765837895
## 138  2.2401633597263   2.8708919052872  -3.7206641613207  -6.089267970401
## 113  0.7567053003217   0.4065020537819  -0.9714001991551  -1.641820139006
## 112  1.1962177089700   0.3852839065424  -1.4050033010063  -2.502134383498
## 135  4.5293077536247   1.9178260728145  -5.5365025657402 -10.450828325853
## 145  0.0778078072434   0.1282698273702  -0.1450072616397  -0.204652773584
## 142  1.5297487900923   1.5584069059027  -2.3499107447406  -3.665499932647
## 115  0.0608626552065   0.0652226037010  -0.0953269865216  -0.142953593755
## 125  0.4667250631935   0.7059569910753  -0.8327105214704  -1.269130743541
##                 [,9]             [,10]             [,11]
## 3     0.000011753249881 -0.000005922458491 -0.000018332521417
## 43    0.000017504874707 -0.000008925811367 -0.000027394493812
## 7     0.000027982642874 -0.000014362761406 -0.000044861594997
## 13    0.000007992185622 -0.000003430595721 -0.000012839818462
## 47    0.000019972931475 -0.000010950768107 -0.000031333289848
## 6     0.000039071900441 -0.000020369510450 -0.000064314268087
## 26    0.000013117048640 -0.000004974026297 -0.000022482603791
## 49    0.000011503083591 -0.000006350356865 -0.000017721388927
## 16    0.000023141092607 -0.000013507732370 -0.000035654631200
## 4     0.000019321877990 -0.000008833774314 -0.000031733213886
## 35    0.000012842485284 -0.000005652420409 -0.000021183350959
## 15    0.000004684717630 -0.000003021287011 -0.000006342368933
## 14    0.000008390544598 -0.000004282363254 -0.000012455692457
## 11    0.000010135804931 -0.000005591962192 -0.000015590144456
## 41    0.000013788248168 -0.000007439523732 -0.000021354827503
## 23    0.000010006599922 -0.000006166030295 -0.000013911153785
## 46    0.000015863098778 -0.000006668067133 -0.000026541353608
## 2     0.000009786505427 -0.000004063954921 -0.000016112903324
## 12    0.000022683720378 -0.000011338373207 -0.000036786512747
## 19    0.000015768730567 -0.000008226670721 -0.000025607966160
## 50    0.000010476534532 -0.000005267076443 -0.000016493037887
## 22    0.000031884743438 -0.000016696161268 -0.000051695403819
## 17    0.000015402786642 -0.000008800987535 -0.000023575204429
## 37    0.000005476958104 -0.000002994295894 -0.000008186916031
## 24    0.000061043332086 -0.000027008916706 -0.000105777763009
## 79   -1.702552166472078 -4.671660136332017  4.213267444755777
## 74   -0.376015874191342 -1.010645183946974  0.946813407659714
## 52   -0.041786644458351 -0.175139839718127  0.137061599718192
## 99    0.076635400165759  0.189335429529520 -0.237990711805839
## 75   -0.020018733900610 -0.080772502985490  0.068444551458475
## 97   -0.044419333546515 -0.172404283361559  0.142355275176225
## 95   -0.294023137353257 -0.898949299045837  0.806665519695555
## 87   -0.178053966846731 -0.642503591858538  0.527332884703694
## 83   -0.008914122574269 -0.031863840778006  0.029715622198513
## 81   -0.030216709283674 -0.075390191967329  0.084872490795066
```

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## 90    -0.440325691628151   -1.087175354701628   1.095313523317906
## 77    -0.744944862940042   -1.477291813327718   1.590237807280766
## 89    -0.013309954559167   -0.049003509381282   0.041489956340901
## 93    -0.037416972424486   -0.116298263398897   0.112557971212130
## 57    -0.266443822268299   -0.951100983377959   0.766389363350442
## 69   -23.559040581324755  -14.722568076508804  33.152474103831842
## 96    -0.007306939726627   -0.028020196319043   0.023777144798892
## 68    -0.004095396191763   -0.013300268720254   0.013326219205553
## 91    -1.218550259328139   -2.821972347322403   2.822345802311488
## 59    -0.080555957300704   -0.269128359007429   0.237164955680274
## 56    -0.905583339473940   -2.551750915918731   2.302323458767980
## 100   -0.050914084610351   -0.190642343957267   0.161722156341916
## 78   -25.022661138385828  -38.993772208661554  45.513520237322879
## 72    -0.011474691814214   -0.044570651483624   0.039358781885425
## 61    -0.050798028327043   -0.070025561510665   0.118121215963514
## 105   -0.124893955634291   -0.059612058132790   0.156477189864216
## 111   -7.839453520253871  -15.302716984669756  15.769443162318892
## 134  -36.099194734461094  -41.541026672964144  58.032057928939970
## 149   -0.225043862848133   -0.934717544856883   0.710224693322959
## 132   -7.805495426617412  -12.286916252973594  14.104905880890220
## 107   -0.956536401264250   -1.411527396727675   1.699297115469073
## 126   -4.541300827790552   -2.992372041222327   6.079614361141402
## 123   -0.602308866169972    0.155332912099689   0.525730177129397
## 137   -0.089982197217525   -0.351500806927117   0.272864279807232
## 127  -16.578925701496193  -19.070281742019361  26.645678109875057
## 119   -0.175747181380794    0.091290563754503   0.129736866566161
## 124  -10.893139870031439   -8.019802186622867  15.186851757359738
## 146   -0.561538998974768   -0.426025595003126   0.787112928916185
## 121   -0.257381243328389   -0.214550758675359   0.370096944239464
## 139  -19.989506357474134  -41.051745494695382  41.320264831899735
## 128  -15.857316748859681  -29.189799117239563  31.019875545276481
## 140   -1.937638812234941   -1.620298785242516   2.785848786804580
## 138   -2.489904764389422   -3.193954235603669   4.137016739916220
## 113   -0.844198334030693   -0.454284123931286   1.084126300823364
## 112   -1.332417209308945   -0.430227107020248   1.565549631876222
## 135   -5.016611405389741   -2.128207681346972   6.134351617413015
## 145   -0.087245807643308   -0.143919354407674   0.162643147010649
## 142   -1.702565407196524   -1.736208760946665   2.616301682481815
## 115   -0.068276242799452   -0.073235305831638   0.106974155134559
## 125   -0.521391350393547   -0.789332529455744   0.930598042955625
##                    [,12]
## 3     -0.00003063721016
## 43    -0.00004575076166
## 7     -0.00007454251701
## 13    -0.00002117887345
## 47    -0.00005249963448
## 6     -0.00010634267531
## 26    -0.00003644061242
## 49    -0.00002983824275
## 16    -0.00006025631312
## 4     -0.00005218844614
## 35    -0.00003477351865
## 15    -0.00001115074665
## 14    -0.00002106718137
```

```
## 11    -0.00002626100458
## 41    -0.00003587548141
## 23    -0.00002418994441
## 46    -0.00004339416447
## 2     -0.00002642045971
## 12    -0.00006087907437
## 19    -0.00004247895557
## 50    -0.00002750482665
## 22    -0.00008579143495
## 17    -0.00003985358476
## 37    -0.00001388671918
## 24    -0.00017192439001
## 79     6.52919371235561
## 74     1.49117722786632
## 52     0.19885998056908
## 99    -0.32830218563373
## 75     0.09869435460389
## 97     0.20726397225394
## 95     1.22682063501092
## 87     0.78591694353167
## 83     0.04265919124967
## 81     0.12732381329412
## 90     1.70846523573435
## 77     2.61409654727122
## 89     0.06062306870726
## 93     0.16669608291112
## 57     1.14549863616193
## 69    58.76700209492407
## 96     0.03431505677964
## 68     0.01923599434340
## 91     4.53392383126812
## 59     0.35773543963389
## 56     3.58605445268153
## 100    0.23598086423720
## 78    74.85916563094293
## 72     0.05638585589124
## 61     0.18609616971452
## 105    0.26168942704949
## 111   23.92743270180399
## 134  100.88115937489420
## 149    0.90854167325025
## 132   22.28438482337877
## 107    2.72495984597371
## 126   10.67068145559521
## 123    1.02051021087670
## 137    0.34417091811513
## 127   44.16659078219188
## 119    0.26996859850543
## 124   26.16336311329370
## 146    1.25677898094357
## 121    0.58511851769572
## 139   64.15684613016958
## 128   48.80045749486577
## 140    4.55872749832501
```

```
## 138   6.77024627270769
## 113   1.83212642025750
## 112   2.78771374327436
## 135  11.57835978099722
## 145   0.22952965076195
## 142   4.08062212799606
## 115   0.16040569451286
## 125   1.41822837999316
##
## $generalized.weights[[2]]
##                  [,1]              [,2]              [,3]              [,4]
## 3    -0.007796345283  0.0166865272635   0.014972762342  -0.279196994248
## 43   -0.006427282891  0.0166018088822   0.014164759985  -0.271603517072
## 7    -0.009901173334  0.0253024813806   0.015039964104  -0.345241065386
## 13   -0.005735201781  0.0221919832930   0.002487361215  -0.238251238938
## 47   -0.008082866232  0.0054377413224   0.026462868558  -0.241349980879
## 6    -0.015526137810  0.0304279344980   0.022298249662  -0.419610277621
## 26   -0.013878748888  0.0958908345962  -0.054397444971  -0.441048091540
## 49   -0.008860677416  0.0054452495677   0.027711645924  -0.253163505660
## 16   -0.015061462204 -0.0001217716059   0.053647498831  -0.384489380292
## 4    -0.007731974839  0.0450016607300  -0.011749984397  -0.323520583562
## 35   -0.009766346543  0.0480047322163  -0.013329957913  -0.338255251660
## 15   -0.010791250212 -0.0020772550094   0.040171385185  -0.275283605750
## 14   -0.004654121323  0.0073896820333   0.016162961591  -0.216168011172
## 11   -0.009085269827  0.0054914528969   0.027966353177  -0.255527807485
## 41   -0.011509500826  0.0129937681688   0.028825762930  -0.338712594197
## 23   -0.009174562135 -0.0006274323677   0.035792274549  -0.265282609062
## 46   -0.017719859399  0.1100080093058  -0.059353578676  -0.545802082165
## 2    -0.010242270899  0.0496398031293  -0.015329999767  -0.350500992467
## 12   -0.007443277928  0.0229275601065   0.009009744843  -0.271936388803
## 19   -0.012665212351  0.0207965112182   0.021960223719  -0.337763855722
## 50   -0.008683675957  0.0172813692163   0.015375729384  -0.279749366580
## 22   -0.015302728339  0.0304383918314   0.022616651494  -0.432001271630
## 17   -0.015555247441  0.0062498218197   0.048226322939  -0.410433200500
## 37   -0.009891500678  0.0052488842681   0.029395256714  -0.273550459744
## 24   -0.076045056889  0.5683066989184  -0.407857435153  -1.752824275342
## 79    0.224369962010  0.2904326103572  -0.422693481543  -0.503947144304
## 74    0.056522570462  0.0835400779535  -0.109238643475  -0.138471171587
## 52    0.062101518682  0.1239970768856  -0.122053346682  -0.170079992245
## 99   11.497759797238 31.1059328168005 -24.349275155308 -41.120965565953
## 75    0.429346924608  1.0037105195665  -0.890632651747  -1.295551612629
## 97    0.022607581083  0.0412800346570  -0.043902002024  -0.059993092242
## 95    0.041617136565  0.0564501997180  -0.079330834584  -0.096911643093
## 87    0.020047942362  0.0334371104648  -0.039814528602  -0.050790791071
## 83    0.601799946174  1.4074358072598  -1.237340216542  -1.816304590331
## 81    0.028656909681  0.0627397139184  -0.058006432416  -0.082052770871
## 90    0.037057816884  0.0448695116798  -0.069846808778  -0.081453652611
## 77    0.047305401967  0.0619428985753  -0.091649914885  -0.108595954798
## 89    0.154828549392  0.3077701327721  -0.298952638715  -0.426113291815
## 93    0.042683695249  0.0931797122217  -0.086287041597  -0.122660923110
## 57    0.065309224374  0.1037403091345  -0.126797561766  -0.161140665028
## 69    1.292939313027  0.9752643369910  -2.168008811269  -2.698851272429
## 96    0.523199609476  1.0742815718833  -1.023985950391  -1.464977651284
## 68    1.568232447800  3.6735784033695  -3.255667340781  -4.650531896345
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## 91   0.230440116505   0.2855873948022  -0.427476863077  -0.525029758434
## 59   0.035167077244   0.0745905152047  -0.071613637757  -0.100175781422
## 56   0.192418736700   0.2633076009854  -0.362860026241  -0.456421406917
## 100  0.020174964961   0.0370553639573  -0.039381115808  -0.053470626322
## 78   1.880942658044   1.9815287641200  -3.416738235553  -3.819571668789
## 72   0.666704854024   1.5847689602422  -1.382865649025  -2.039448299204
## 61   0.006189491024   0.0081998723939  -0.011930744233  -0.013900051026
## 105  0.003480311961  -0.0029154048530  -0.004960961928  -0.003680580078
## 111  0.335030114945   0.3017622260104  -0.600189095479  -0.590254046256
## 134  1.515049929593   1.2930962852994  -2.601000150435  -3.216738958674
## 149  0.007008338291   0.0032538950214  -0.012553110982  -0.009485189868
## 132  0.103464518930   0.1340811392167  -0.187095887599  -0.237355730715
## 107  0.047736928391   0.0112693204582  -0.078149407595  -0.088382892882
## 126  0.052182266923   0.0310865336313  -0.084376626248  -0.107343651492
## 123  0.005807676890  -0.0077234576126  -0.006349439607  -0.009667114304
## 137  0.003179250567  -0.0001271679200  -0.005443695320  -0.003167950663
## 127  0.902994293990   0.6623625413216  -1.558946725366  -1.624918240705
## 119  0.001811431928  -0.0040932310568  -0.001458741955  -0.004584303415
## 124  0.515545443682   0.2992281963531  -0.859486490084  -0.916715352892
## 146  0.037642473740   0.0145141991885  -0.063193178990  -0.049078045462
## 121  0.008723656263  -0.0000622574627  -0.014015524729  -0.010046622272
## 139  0.827532226863   0.7849418839745  -1.482686265286  -1.590792652494
## 128  0.598792316083   0.5393171325960  -1.062243061256  -1.148370638813
## 140  0.076613728150   0.0380726592597  -0.128518659030  -0.116434659265
## 138  0.045648053772   0.0298453159465  -0.076635568513  -0.092232429075
## 113  0.027132325014   0.0053262925598  -0.043340990708  -0.039247157542
## 112  0.039707248136   0.0032912144083  -0.060625293261  -0.066398485815
## 135  0.064488723737   0.0005515132444  -0.092824711396  -0.134999215823
## 145  0.003741995179  -0.0012402503908  -0.006072582638  -0.002742274637
## 142  0.179566933685   0.1162050440204  -0.312930719787  -0.247754054443
## 115  0.004215802412  -0.0016967605021  -0.006721226798  -0.004148054353
## 125  0.012116604707   0.0052799412612  -0.020383787913  -0.019775257156
##                 [,5]             [,6]             [,7]             [,8]
## 3    0.004070487627  -0.0077577949720  -0.008654146858   0.14538176132
## 43   0.003374993330  -0.0077847859065  -0.008181067473   0.14151673918
## 7    0.005170461471  -0.0120347489938  -0.008994756058   0.18000105557
## 13   0.002957490502  -0.0103684248197  -0.002234012801   0.12290970234
## 47   0.004259264728  -0.0025091244079  -0.014234500581   0.12664396005
## 6    0.008102328212  -0.0146057154101  -0.013069771866   0.21944821051
## 26   0.006893608925  -0.0457934140703   0.025012223293   0.22261222980
## 49   0.004661513557  -0.0024646376983  -0.014930099247   0.13285563271
## 16   0.008000530097   0.0002713819405  -0.028692926936   0.20408055840
## 4    0.003943308058  -0.0214701983412   0.004480707080   0.16608718887
## 35   0.004963834559  -0.0228301276140   0.005150481275   0.17336074757
## 15   0.005706843628   0.0012034543045  -0.021316811340   0.14545365505
## 14   0.002461167548  -0.0032397881362  -0.008919633164   0.11276839955
## 11   0.004776985668  -0.0024780605803  -0.015073591863   0.13409122399
## 41   0.006044213210  -0.0060057242886  -0.015917795071   0.17770342426
## 23   0.004860398392   0.0005186764851  -0.019037570394   0.13994890382
## 46   0.008853216329  -0.0525205737595   0.027053064974   0.27687707053
## 2    0.005192189698  -0.0234751931927   0.006076988322   0.17945467148
## 12   0.003871760507  -0.0109389056627  -0.005634747482   0.14111448690
## 19   0.006602930285  -0.0098875945749  -0.012498466583   0.17640607400
## 50   0.004522787314  -0.0080754473976  -0.008879036169   0.14561404583
```

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## 22    0.007993849010   -0.0145562827527   -0.013276951350    0.22607064533
## 17    0.008235859237   -0.0027563855978   -0.026088386739    0.21722818401
## 37    0.005194751355   -0.0022550717161   -0.015891009440    0.14356141469
## 24    0.037293549582   -0.2739101489388    0.194202713047    0.86990497219
## 79    2.479488493313    3.2095213691438   -4.671141651156   -5.56905269611
## 74    0.623238945160    0.9205966289109   -1.204549734584   -1.52652125093
## 52    0.057059282685    0.0890645304978   -0.113837648402   -0.14528887459
## 99   -5.562852858883  -14.8455554252169   11.740772621289   19.85530668426
## 75   -0.127839953733   -0.3075832247865    0.264669318263    0.39346332492
## 97    0.094083509177    0.1470176772456   -0.184153736693   -0.23821609501
## 95    0.458555039188    0.6213155201830   -0.874118297335   -1.06737561289
## 87    0.172012777924    0.2680993010398   -0.342036841435   -0.42485405180
## 83   -0.204916634101   -0.4827089735213    0.420350577337    0.62423618527
## 81    0.026163386170    0.0317403363444   -0.051569677370   -0.05811169620
## 90    0.409017919028    0.4949156554488   -0.770915982555   -0.89879774163
## 77    0.521874458172    0.6827742665369   -1.011074370842   -1.19762488293
## 89   -0.003226457133   -0.0194822589489    0.004649888134    0.01324511775
## 93    0.026601726164    0.0314628161412   -0.052624222998   -0.05969060943
## 57    0.718398122577    1.1403230679622   -1.394935091929   -1.77216618113
## 69   14.288390278558   10.7777351340179  -23.958863120882  -29.82525156680
## 96   -0.153126087025   -0.3182013891021    0.297809063464    0.43179168960
## 68   -0.612284513254   -1.4254732814330    1.267914288484    1.82085521371
## 91    2.546589942737    3.1560114300123   -4.724040463996   -5.80208795380
## 59    0.056444042531    0.0870885987134   -0.114436475261   -0.14222693218
## 56    2.126366046570    2.9097142295954   -4.009867943363   -5.04377022822
## 100   0.080841446459    0.1203462602628   -0.158069500665   -0.19858225898
## 78   20.786468787276   21.8980549650079  -37.758685726841  -42.21043467102
## 72   -0.228375635898   -0.5450170894232    0.472522035990    0.70436793260
## 61    0.062738218036    0.0785813083752   -0.120697341013   -0.13769767738
## 105   0.038461245017   -0.0322184050232   -0.054824042893   -0.04067442624
## 111   3.702448367201    3.3348018912968   -6.632744453249   -6.52295131778
## 134  16.742954995088   14.2901250207868  -28.743889960712  -35.54847570473
## 149   0.077449785872    0.0359590907561   -0.138725574766   -0.10482169863
## 132   1.143395838379    1.4817429024992   -2.067613723743   -2.62303983551
## 107   0.527545151017    0.1245382885580   -0.863636233430   -0.97672741300
## 126   0.576670992697    0.3435401193823   -0.932453794900   -1.18626448630
## 123   0.064181167189   -0.0853526347406   -0.070168236403   -0.10683216217
## 137   0.035134188081   -0.0014053442864   -0.060158773644   -0.03500931181
## 127   9.979072328666    7.3198288754143  -17.228062494441  -17.95711972920
## 119   0.020018299501   -0.0452346698624   -0.016120690441   -0.05066155529
## 124   5.697339734701    3.3067980983792   -9.498263618476  -10.13070500265
## 146   0.415990411678    0.1603977394607   -0.698353586563   -0.54236595812
## 121   0.096405921281   -0.0006880129008   -0.154886842509   -0.11102613935
## 139   9.145134139746    8.6744643744967  -16.385301191992  -17.57999473993
## 128   6.617308516548    5.9600428374146  -11.738944984933  -12.69074870231
## 140   0.846665299776    0.4207444310990   -1.420271426561   -1.28673004265
## 138   0.504460807010    0.3298233095077   -0.846906659605   -1.01926898868
## 113   0.299841799196    0.0588613450307   -0.478965242602   -0.43372391877
## 112   0.438808421908    0.0363715107045   -0.669975647084   -0.73377572472
## 135   0.712670769750    0.0060948231745   -1.025814354654   -1.49188865091
## 145   0.041353130136   -0.0137061202254   -0.067108664781   -0.03030512721
## 142   1.984410567260    1.2841925436308   -3.458225935144   -2.73795265991
## 115   0.046589217087   -0.0187510551157   -0.074276890572   -0.04584052711
## 125   0.133901704094    0.0583491126014   -0.225263099976   -0.21853817106
```

```
##                  [,9]               [,10]               [,11]               [,12]
## 3       0.006012495292  -0.0121171612698  -0.012205765529   0.21505225855
## 43      0.004971604558  -0.0121086719849  -0.011541961274   0.20927492478
## 7       0.007636705326  -0.0185898734602  -0.012497134327   0.26609600508
## 13      0.004393431235  -0.0161556251794  -0.002652595754   0.18261324114
## 47      0.006265242258  -0.0039345148106  -0.020740786786   0.18666850620
## 6       0.011971625574  -0.0224614128582  -0.018319971722   0.32393440377
## 26      0.010425628731  -0.0705984011927   0.039295958410   0.33416926872
## 49      0.006862092371  -0.0039016347829  -0.021738188809   0.19581327124
## 16      0.011724140534   0.0002575350999  -0.041914452299   0.29917489001
## 4       0.005888630772  -0.0331155906931   0.007765010876   0.24732577556
## 35      0.007425176595  -0.0352671650534   0.008861181559   0.25835929061
## 15      0.008380719671   0.0016965776426  -0.031255523548   0.21369553572
## 14      0.003613334305  -0.0052097725549  -0.012844158697   0.16667111695
## 11      0.007033923297  -0.0039287534286  -0.021942929010   0.19763752315
## 41      0.008904272962  -0.0094079109984  -0.022915037078   0.26193103677
## 23      0.007131649554   0.0006355830452  -0.027883105668   0.20575985386
## 46      0.013351638188  -0.0809770902471   0.042688518274   0.41461574552
## 2       0.007776176092  -0.0363621932847   0.010311429061   0.26756598720
## 12      0.005729102333  -0.0168726074871  -0.007680330715   0.20908166722
## 19      0.009760956185  -0.0152767131199  -0.017750178052   0.26057290148
## 50      0.006688512150  -0.0125820522456  -0.012528396612   0.21543494462
## 22      0.011805426319  -0.0224254542457  -0.018597164916   0.33360844863
## 17      0.012086948582  -0.0044208066067  -0.037909941589   0.31886872810
## 37      0.007653074898  -0.0036644968971  -0.023100876182   0.21158289558
## 24      0.056750501265  -0.4203617852161   0.299825542648   1.31624068903
## 79     -2.737852006302  -3.5439553686859   5.157876082928   6.14935042701
## 74     -0.688260170729  -1.0166704449949   1.330215070830   1.68579815852
## 52     -0.110495849745  -0.1941108752222   0.218717693702   0.29148007360
## 99     -8.522015368997 -22.8930912610851  18.016100610161  30.44483321797
## 75     -0.294884783694  -0.6702499685810   0.610154218472   0.88192189093
## 97     -0.115172629938  -0.1845154455386   0.225107605986   0.29384333282
## 95     -0.506414032337  -0.6861986971017   0.965347889637   1.17880157976
## 87     -0.193218522771  -0.3026766620650   0.384151459947   0.47816117077
## 83     -0.407368847049  -0.9346107367199   0.835698014113   1.22228527290
## 81     -0.052743774758  -0.0887173755925   0.105220782553   0.13368681136
## 90     -0.451666448997  -0.5465383116340   0.851299880628   0.99252877240
## 77     -0.576304678745  -0.7540175390977   1.116527221313   1.32255714157
## 89     -0.136997695717  -0.2566824744290   0.265649909211   0.37335213462
## 93     -0.065662116579  -0.1151599248876   0.131376125193   0.17138612675
## 57     -0.793433563089  -1.2594691941942   1.540624082016   1.95728643424
## 69    -15.777233360039 -11.9007697152739  26.455364609259  32.93302778152
## 96     -0.357648280553  -0.7234938958428   0.700271027604   1.00228503808
## 68     -1.070357630623  -2.4887159791913   2.219436349168   3.17264694615
## 91     -2.811944513082  -3.4848681597476   5.216285255853   6.40666563158
## 59     -0.088076915043  -0.1526788260323   0.178710746244   0.23183197134
## 56     -2.347935739241  -3.2129108220954   4.427700483785   5.56933743612
## 100    -0.099693613664  -0.1538613874515   0.194829415593   0.24805409552
## 78    -22.952408385000 -24.1798212855738  41.693121797118  46.60874074523
## 72     -0.448740269107  -1.0466221829805   0.928476482584   1.36462119880
## 61     -0.069685551057  -0.0876279680947   0.134079041378   0.15319376011
## 105    -0.042468887402   0.0355755466212   0.060536680587   0.04491268100
## 111    -4.088241624785  -3.6822865710148   7.323873089103   7.20263956415
## 134   -18.487562484288 -15.7791488604377  31.738988837152  39.25260899323
```

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## 149   -0.085520014604  -0.0397060099260   0.153180709879   0.11574406690
## 132   -1.262537109628  -1.6361397676470   2.283058033780   2.89635926702
## 107   -0.582515090405  -0.1375151155848   0.953626694556   1.07850191816
## 126   -0.636759820079  -0.3793368270262   1.029615011317   1.30987264910
## 123   -0.070868812527   0.0942463363493   0.077479731342   0.11796401974
## 137   -0.038795152807   0.0015517804542   0.066427287598   0.03865726450
## 127  -11.018886645991  -8.0825513624769  19.023217940908  19.82824257284
## 119   -0.022104196241   0.0499480997096   0.017800458276   0.05594046387
## 124   -6.290999669376  -3.6513647969599  10.487977910030  11.18631936833
## 146   -0.459336403337  -0.1771111032346   0.771121679020   0.59888021815
## 121   -0.106451369788   0.0007597034990   0.171025973592   0.12259500723
## 139  -10.098052517253  -9.5783391992120  18.092641334655  19.41182134939
## 128   -7.306828735568  -6.5810763032683  12.962137147854  14.01311833384
## 140   -0.934887398152  -0.4645857891909   1.568262994831   1.42080666589
## 138   -0.557025369364  -0.3641907324619   0.935153907553   1.12547630463
## 113   -0.331085163855  -0.0649946675765   0.528873179968   0.47891773295
## 112   -0.484532038756  -0.0401614038256   0.739786772521   0.81023478615
## 135   -0.786930705494  -0.0067299006840   1.132703694438   1.64734269794
## 145   -0.045662105496   0.0151342910589   0.074101353896   0.03346290622
## 142   -2.191185150236  -1.4180047607458   3.818571338145   3.02324594992
## 115   -0.051443790074   0.0207049056272   0.082016505209   0.05061708698
## 125   -0.147854194310  -0.0644290607856   0.248735401689   0.24130973857
##
## $generalized.weights[[3]]
##                    [,1]              [,2]              [,3]
## 3     0.00011388120712 -0.00003974371904 -0.000057936563187
## 43    0.00021427438230 -0.00003377538354 -0.000166364211110
## 7     0.00021767475542 -0.00002808728811 -0.000175284845044
## 13    0.00009531117272 -0.00004429973564 -0.000036991243477
## 47    0.00009260519339 -0.00003588442229 -0.000036372369533
## 6     0.00009833132103 -0.00002568899773 -0.000057083508603
## 26    0.00012559366845  0.00002857206442 -0.000151899149511
## 49    0.00005646221709 -0.00003923086659  0.000004677740759
## 16    0.00004397633558 -0.00003340734133  0.000014731723518
## 4     0.00022314409066 -0.00001943197376 -0.000193800093423
## 35    0.00012009781379 -0.00002630310440 -0.000082499832417
## 15    0.00002616814078 -0.00003747082341  0.000038796103370
## 14    0.00013306952607 -0.00004079593367 -0.000077728326265
## 11    0.00004937369471 -0.00003983051932  0.000012808341550
## 41    0.00007889049458 -0.00003817188389 -0.000021167036173
## 23    0.00006943052149 -0.00003458429428 -0.000014146874440
## 46    0.00015114497798  0.00002720927435 -0.000174581551462
## 2     0.00009937093694 -0.00003096266423 -0.000056797878234
## 12    0.00017602763062 -0.00003157947584 -0.000130267687488
## 19    0.00005163282886 -0.00003475742605  0.000001842512674
## 50    0.00007952005296 -0.00004118413991 -0.000020755635671
## 22    0.00011771040663 -0.00002791846769 -0.000073688422987
## 17    0.00005010912958 -0.00003589560819  0.000008769991581
## 37    0.00003531446053 -0.00004290274894  0.000030554318684
## 24    0.00033688740217  0.00265352814775 -0.003267821968223
## 79    7.10395545183543  3.27755319941932 -8.223472335014760
## 74    2.63808262246822  0.93895535965379 -2.923873334762169
## 52    1.16363454741554  0.33276332556446 -1.250012631764599
## 99    0.03486229930110 -0.01129626577653 -0.023655287736482
```

98

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## 75    0.14406186793041 -0.01808728882049 -0.116545410987242
## 97    2.15825736417694  0.71561022062543 -2.376389409085586
## 95    4.11582114722536  1.67030117609539 -4.666183120994958
## 87    1.00028789029833  0.28067607527101 -1.064316384333155
## 83    0.23203294173808  0.00791701675834 -0.213570090480868
## 81    0.45412644592195  0.06930351194580 -0.449489781018369
## 90    3.65651084276906  1.46318850450834 -4.133622494622547
## 77    0.87941331753527  0.24610994692159 -0.928270084870876
## 89    1.77217071579902  0.53509616139527 -1.932080852583374
## 93    0.46494100617592  0.07460148320223 -0.462604326182305
## 57    5.59939551422166  2.45820654254810 -6.434278030360395
## 69    8.71888844374177  3.58537305509491 -9.949235137543646
## 96    1.05586120845003  0.24474032006216 -1.114482906558488
## 68    0.16446189335655 -0.01712614919497 -0.138457483425238
## 91    6.96683798397024  3.26119562089337 -8.069654146032311
## 59    0.29287002138783  0.01647344973307 -0.270263380220325
## 56    6.84837513322684  3.18606638810203 -7.928117763026477
## 100   1.64951996173612  0.51623517526760 -1.797689904046129
## 78    8.29673016800390  3.77265762082150 -9.559375463487539
## 72    0.15080209990676 -0.01082391945463 -0.127423630779573
## 61    0.92515598621805  0.24287961162394 -0.973464496563965
## 105 -0.01779426981192 -0.01653937973461  0.025650394579385
## 111 -2.37283826009579 -1.67339379823835  3.064561488755782
## 134 -5.02717920934207 -3.71743770657356  6.671832699385196
## 149 -0.03454197667271 -0.04387101686688  0.055186414162391
## 132 -4.84570477098180 -3.31456654753342  6.198133069077107
## 107 -0.10094740778789 -0.12025525651755  0.154410087502426
## 126 -1.69039770066436 -1.14851381615781  2.160785624739604
## 123 -0.04316166880046 -0.01910398914672  0.051583879306828
## 137 -0.01631205861365 -0.02196001288353  0.027019806339553
## 127 -6.07408737502998 -3.84114633409665  7.654546279229110
## 119 -0.00912678191121 -0.00295544133323  0.010545215550790
## 124 -4.23631449661152 -2.51237571908791  5.270662250849353
## 146 -0.16657990944717 -0.09511519225011  0.209018162290140
## 121 -0.05681046022723 -0.04104522110788  0.075613037205302
## 139 -4.30022361858999 -3.25095390282894  5.634700245076683
## 128 -3.79490078853252 -2.83582971936429  4.959513061430147
## 140 -0.79609371541824 -0.47057230109607  0.994297392017400
## 138 -0.52877174207742 -0.46144204416614  0.721910732321625
## 113 -0.21408649919959 -0.13354531974500  0.272006168482344
## 112 -0.23382946585923 -0.15081293372685  0.298641916778414
## 135 -0.51164967873887 -0.44646368996063  0.696054388631293
## 145 -0.01755718136545 -0.01645675690515  0.025614129418454
## 142 -0.97235075889504 -0.49049876662516  1.181226654680828
## 115 -0.01073119061549 -0.01132358335841  0.016453981733087
## 125 -0.11105356171591 -0.09982260941498  0.154992068178584
##                  [,4]             [,5]             [,6]             [,7]
## 3    0.000007366527460  0.008174391256  0.0008925630390 -0.009343180702
## 43  -0.000107085887176  0.013661507377  0.0009428058550 -0.014849198472
## 7   -0.000120151040469  0.013552509992  0.0008604759488 -0.014690254130
## 13   0.000027417545699  0.007004323721  0.0009034466563 -0.008140167284
## 47   0.000034842096019  0.006897996299  0.0007329953841 -0.008034110551
## 6   -0.000003880805505  0.006800987893  0.0006755975741 -0.007859830482
## 26  -0.000166347870327  0.008045543224 -0.0007048844916 -0.007329051160
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## 49     0.000080133364464   0.004274596408   0.0007345978893  -0.005412386701
## 16     0.000091602423842   0.003049503388   0.0006390134695  -0.004167910372
## 4     -0.000154989339711   0.013674471624   0.0005744617205  -0.014388843468
## 35    -0.000037554638783   0.008165187124   0.0006099877524  -0.008963406623
## 15     0.000122632815307   0.001185378342   0.0006041381819  -0.002237259756
## 14    -0.000013975879891   0.009742847212   0.0009101231349  -0.010876632086
## 11     0.000089368027597   0.003651653326   0.0007318766934  -0.004791993548
## 41     0.000048768430611   0.005841524465   0.0008140237446  -0.007011941963
## 23     0.000055757382967   0.005893365495   0.0006528128481  -0.006895737429
## 46    -0.000186588957851   0.009495884029  -0.0005858111818  -0.008872103060
## 2     -0.000008312089558   0.006941199735   0.0006883104349  -0.007807428793
## 12    -0.000072875703212   0.011448712053   0.0008059238383  -0.012549777523
## 19     0.000067163404120   0.003619020602   0.0007240742454  -0.004747984869
## 50     0.000047867327677   0.005897534541   0.0008452302776  -0.007059437979
## 22    -0.000017656328505   0.008025437068   0.0007458660475  -0.009123566469
## 17     0.000082990762645   0.003586543649   0.0007201696639  -0.004738278181
## 37     0.000110283098581   0.002283564594   0.0007496055821  -0.003431578268
## 24    -0.005788709191962   0.008327815865  -0.0462669063975   0.042653712397
## 79   -11.983521824776568   8.236751551385   4.6941777326889 -10.152374212333
## 74    -4.110428890688681   1.873428608899   1.0110975505877  -2.313023329722
## 52    -1.721584996550606   0.719761730748   0.3807515548496  -0.891398175905
## 99    -0.035525726498792   0.057347719048   0.0302765376933  -0.073698756100
## 75    -0.169419413288235   0.184411834945   0.1101013756021  -0.239123228773
## 97    -3.273927923599561   1.291267392551   0.6645601789180  -1.582941517680
## 95    -6.637900067939023   3.047241613022   1.6668386510786  -3.751434073919
## 87    -1.495878659874696   0.707634095917   0.3948363184844  -0.886508866054
## 83    -0.291818751217622   0.213821638353   0.1184811307221  -0.272472270533
## 81    -0.618258211454288   0.359401801232   0.1998478411470  -0.455670112321
## 90    -5.875440725771055   2.631628013837   1.4408477696208  -3.244446787958
## 77    -1.333656154764528   0.743796963962   0.4272759655874  -0.937193358676
## 89    -2.609323201935536   0.986476133899   0.4813269391281  -1.200228502147
## 93    -0.638778538443684   0.366776322107   0.2043676324899  -0.464432500346
## 57    -9.267337998543862   4.821911402698   2.6890668934696  -5.930584788555
## 69   -14.002901446543742  21.972089149847  10.6448508777088 -26.253640465421
## 96    -1.468599724381006   0.602649612966   0.2848633508545  -0.734415501866
## 68    -0.183538207088833   0.175293589631   0.0929340165716  -0.223045030668
## 91   -11.845901894300166   8.655912567794   5.0623784291034 -10.730262521442
## 59    -0.387171038266394   0.308138746066   0.1812089979732  -0.395465731390
## 56   -11.612764514421247   8.050457487867   4.6827965193021  -9.967657467456
## 100   -2.475372749798818   0.992367369367   0.5177473578594  -1.223053600714
## 78   -13.988323841355029  24.076837942430  13.3104094246824 -29.402303183189
## 72    -0.181741748094889   0.174156073325   0.1025934790156  -0.225162336775
## 61    -1.353112112514951   0.644998157560   0.3581474275997  -0.811936993014
## 105    0.036627487146024   0.023687190500   0.0197063039430  -0.032560302999
## 111    4.559471567672083   3.360828662358   2.2875290926842  -4.283344411272
## 134    9.605838464411573  30.694017413908  19.3980585637943 -38.380025580475
## 149    0.085379346734264   0.044536545530   0.0511949378946  -0.067544945451
## 132    9.216502721014134   7.958004444971   5.2628582464971 -10.050072037391
## 107    0.251131366312236   0.132152182130   0.1474778466651  -0.195239399118
## 126    3.201228887376320   2.466053403528   1.6265614208160  -3.116546906627
## 123    0.066095665028732   0.061012416569   0.0256051923847  -0.071827514918
## 137    0.040681420258510   0.020934520531   0.0248901264275  -0.032477946646
## 127   11.103576804905265  10.224509545958   6.2173647205150 -12.710278507818
## 119    0.012265455519279   0.012273326881   0.0036036578094  -0.013911822840
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## 124   7.515597963609737   6.600752256837   3.7798970893301  -8.116776619503
## 146   0.280712110085177   0.225188059210   0.1196794354269  -0.276484900803
## 121   0.105073042916542   0.076622977511   0.0506737033186  -0.098771857186
## 139   8.593057283439526   6.533823419972   4.7669856538374  -8.441604001934
## 128   7.535656808499691   5.680400064852   4.0992537995494  -7.322249968043
## 140   1.395881366074297   1.100551571208   0.6240594782744  -1.356029159841
## 138   1.129268514596201   0.720956025167   0.6048526542120  -0.967145611321
## 113   0.379874141848088   0.292990993501   0.1728333204834  -0.365301517771
## 112   0.423438894950156   0.321976175817   0.1974583898868  -0.403957815958
## 135   1.101908184925924   0.722140328944   0.6103155843655  -0.967619857258
## 145   0.035542389523005   0.022941505368   0.0188445078348  -0.031694620328
## 142   1.586205736041967   1.338048810867   0.6440945350932  -1.604324218999
## 115   0.022691682697250   0.013778258669   0.0124822757050  -0.019764756005
## 125   0.234574738083453   0.148963926629   0.1255228874076  -0.202097018757
##                   [,8]             [,9]             [,10]            [,11]
## 3      -0.010532451411  -0.007682532473  -0.0008034239265   0.008732044616
## 43     -0.015828944644  -0.012856033587  -0.0008542324616   0.013928590184
## 7      -0.015660470737  -0.012756924114  -0.0007816094223   0.013786942497
## 13     -0.009349461295  -0.006581291660  -0.0008104393369   0.007598531119
## 47     -0.009189825309  -0.006480514160  -0.0006576020148   0.007499428347
## 6      -0.009012964597  -0.006394053307  -0.0006114461780   0.007351836773
## 26     -0.007002509213  -0.007570587850   0.0006356802882   0.006922922012
## 49     -0.006699279769  -0.004015186359  -0.0006568136808   0.005032323157
## 16     -0.005503278678  -0.002866882162  -0.0005719281809   0.003867773163
## 4      -0.015044769449  -0.012874129317  -0.0005214803725   0.013519238836
## 35     -0.009891223927  -0.007678176767  -0.0005498611500   0.008395706861
## 15     -0.003570276940  -0.001120556960  -0.0005365768996   0.002055029079
## 14     -0.011912607454  -0.009154868239  -0.0008189534873   0.010172061472
## 11     -0.006112345307  -0.003430797905  -0.0006538812291   0.004449612878
## 41     -0.008295968905  -0.005488255616  -0.0007314677289   0.006538147458
## 23     -0.007921840279  -0.005530085248  -0.0005837861573   0.006425016762
## 46     -0.008621989084  -0.008937355048   0.0005258335732   0.008373984767
## 2      -0.008849874278  -0.006525299169  -0.0006195285318   0.007302676177
## 12     -0.013543915231  -0.010771207923  -0.0007284636090   0.011764787393
## 19     -0.006087755708  -0.003401881120  -0.0006502849596   0.004416434284
## 50     -0.008332747379  -0.005540800903  -0.0007584346630   0.006582041484
## 22     -0.010277927577  -0.007546486428  -0.0006752168999   0.008538769019
## 17     -0.006096732019  -0.003370689529  -0.0006457465665   0.004402495478
## 37     -0.004826470021  -0.002148429837  -0.0006682709278   0.003171855914
## 24      0.086030392885  -0.007977770326   0.0412169634576  -0.037433067786
## 79    -14.422844729482 -10.494551230213  -5.5861706218713  12.662572529218
## 74     -3.134403844944  -2.839060648080  -1.2885270749041   3.337721461791
## 52     -1.174864570479  -1.156449111000  -0.4703747182364   1.336674800694
## 99     -0.089162158091  -0.062761201542  -0.0183995140849   0.070159044345
## 75     -0.303774971179  -0.217975276300  -0.0782622329187   0.247628935476
## 97     -2.114568111808  -2.120246131682  -0.8930952706014   2.464119692430
## 95     -5.187980861903  -4.561047385914  -2.2016204690753   5.412788840877
## 87     -1.176827812273  -1.064754763070  -0.4553765036209   1.239492410735
## 83     -0.344871657488  -0.285241942970  -0.0979198026491   0.322555982962
## 81     -0.589182931943  -0.512178636802  -0.1933825057261   0.586359604558
## 90     -4.473086249154  -3.979939433046  -1.9075562351326   4.718083432997
## 77     -1.252927676023  -1.033286812918  -0.4639902305933   1.212019133246
## 89     -1.576700595380  -1.678075904131  -0.6537817842140   1.929504037361
## 93     -0.600998470778  -0.523469442909  -0.1996316180440   0.599906607176
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## 57    -8.325674858232   -6.812011783712   -3.4616945962249   8.148585935721
## 69   -36.057857541150  -23.172875271481  -10.8910882948477  27.442229027632
## 96    -0.938854866363   -1.008353287988   -0.3495558310096   1.142768698245
## 68    -0.274769497984   -0.220911057817   -0.0651476953423   0.245810539967
## 91   -15.351808712506  -10.796788276796   -5.8971733566846  13.093409292731
## 59    -0.510719642765   -0.390724236843   -0.1520749966041   0.448771612213
## 56   -14.231968139480  -10.215885471004   -5.5338586674164  12.366428663650
## 100   -1.625256097148   -1.620850903548   -0.6732445006269   1.879845416686
## 78   -41.832915617372  -24.818409743034  -13.2899048148603  30.005166818789
## 72    -0.286072175748   -0.213187082470   -0.0759274352547   0.241965454290
## 61    -1.076625953359   -0.976743603057   -0.4069922421487   1.134009880485
## 105   -0.047460456003   -0.006228903939   -0.0043381909457   0.007983403241
## 111   -6.412988035121   -1.035509409447   -0.6748550442645   1.298998238790
## 134  -56.954009563123  -21.906082866886  -13.5425000908257  27.176082171897
## 149   -0.106882732741   -0.011219016118   -0.0108649684131   0.015649606915
## 132  -15.051879652758   -2.997894599165   -1.9246540280595   3.744618419216
## 107   -0.322829803081   -0.034311438778   -0.0345619876109   0.048105001062
## 126   -4.648850018125   -0.775899950014   -0.4947590586822   0.968150451759
## 123   -0.093019572104   -0.017398354216   -0.0068193534063   0.020106757059
## 137   -0.050211370280   -0.005220193605   -0.0049584672267   0.007265286123
## 127  -18.558807278090   -4.001598848549   -2.3545660866262   4.919115858007
## 119   -0.016327992712   -0.003265465351   -0.0008250290348   0.003604353885
## 124  -11.641484401895   -2.328780887949   -1.2884119700014   2.831590013590
## 146   -0.374430245708   -0.061280872129   -0.0293372545243   0.073035688096
## 121   -0.139112521034   -0.020617352582   -0.0119396480738   0.025415296636
## 139  -12.960641331667   -2.263181844790   -1.5913296289725   2.882428157911
## 128  -11.200129785995   -1.918486239636   -1.3335733370217   2.437542933617
## 140   -1.916003923925   -0.316468207399   -0.1698882594191   0.383240818054
## 138   -1.527192079653   -0.202463878796   -0.1609893211040   0.265342599130
## 113   -0.514735049394   -0.081304012291   -0.0443921544400   0.098870593468
## 112   -0.577950048072   -0.090176340278   -0.0516551310237   0.110541541501
## 135   -1.546444841330   -0.211854912394   -0.1720719058965   0.278666086264
## 145   -0.044832606331   -0.005874698397   -0.0038360573518   0.007455733939
## 142   -2.165597246431   -0.383958114802   -0.1735880688079   0.452667216837
## 115   -0.027832992340   -0.003432820207   -0.0023318585749   0.004409336903
## 125   -0.310152081388   -0.040014239713   -0.0306573429370   0.052165940865
##                  [,12]
## 3     0.009794353362
## 43    0.014800043503
## 7     0.014652573277
## 13    0.008680077900
## 47    0.008526480261
## 6     0.008389492792
## 26    0.006630186498
## 49    0.006178538875
## 16    0.005058292265
## 4     0.014103686274
## 35    0.009228988152
## 15    0.003238254395
## 14    0.011092590890
## 11    0.005626226211
## 41    0.007685557806
## 23    0.007332102207
## 46    0.008150696787
```

```
## 2     0.008240148582
## 12    0.012651112642
## 19    0.005619296544
## 50    0.007720349720
## 22    0.009575423192
## 17    0.005616337301
## 37    0.004415638605
## 24   -0.076049592231
## 79   18.143004999216
## 74    4.597518702887
## 52    1.798776935063
## 99    0.088371983961
## 75    0.325239317177
## 97    3.341547655134
## 95    7.578843617441
## 87    1.686919204420
## 83    0.418995255478
## 81    0.776671365621
## 90    6.593698967124
## 77    1.666689915569
## 89    2.570388432940
## 93    0.796351321287
## 57   11.558464871180
## 69   37.867979289231
## 96    1.482820163929
## 68    0.309300022434
## 91   18.887015854243
## 59    0.598596641023
## 56   17.807006051871
## 100   2.541353425307
## 78   42.895554788317
## 72    0.317324704393
## 61    1.534841177463
## 105   0.012006735297
## 111   1.959621979554
## 134  40.492562788813
## 149   0.025713613264
## 132   5.643244718432
## 107   0.081595775645
## 126   1.455279998016
## 123   0.026383654948
## 137   0.011763226384
## 127   7.221631650486
## 119   0.004284322109
## 124   4.084106371912
## 146   0.100062671911
## 121   0.036489425953
## 139   4.456077305684
## 128   3.754864957471
## 140   0.546000719987
## 138   0.424309567122
## 113   0.140987986113
## 112   0.160040300320
## 135   0.450589972477
```

```
## 145   0.010881413137
## 142   0.615175917807
## 115   0.006441980746
## 125   0.081668238035
##
##
## $result.matrix
##                                           1                    2
## error                          0.0009705105274    0.0007516129449
## reached.threshold              0.0087327388754    0.0088879563769
## steps                        290.0000000000000  242.0000000000000
## Intercept.to.1layhid1         -1.2105118254628   -1.6938433671109
## Sepal.Length.to.1layhid1      -0.8507532835151   -0.2169268888924
## Sepal.Width.to.1layhid1        0.9383179673370    2.4188854283250
## Petal.Length.to.1layhid1       0.3661865845928    0.0055579681568
## Petal.Width.to.1layhid1        1.1298860300382   -2.0355044588880
## Intercept.to.1layhid2          2.0419777239344    1.6690830391715
## Sepal.Length.to.1layhid2       0.7990871234269   -0.0820233897107
## Sepal.Width.to.1layhid2       -0.3155146297256   -0.0242334775541
## Petal.Length.to.1layhid2      -1.6254000377789    0.3098701440217
## Petal.Width.to.1layhid2       -2.5463485061433   -1.9927152916746
## Intercept.to.1layhid3          1.1765978266675    0.0986682430494
## Sepal.Length.to.1layhid3       0.1457271367604    0.5160619709133
## Sepal.Width.to.1layhid3        1.4405709993270    1.6890077073447
## Petal.Length.to.1layhid3      -0.8046004024133   -1.4370213797856
## Petal.Width.to.1layhid3       -2.2276217009841   -1.2300397042398
## Intercept.to.1layhid4          0.7595847623848   -0.5880508730534
## Sepal.Length.to.1layhid4       0.5442506527086    0.4129505834598
## Sepal.Width.to.1layhid4       -3.4820107954259   -3.4088888748308
## Petal.Length.to.1layhid4       1.2679267438745    2.8221965405748
## Petal.Width.to.1layhid4        0.6821148643111    7.3878100933378
## Intercept.to.1layhid5          0.4706146139866   -0.7664246855860
## Sepal.Length.to.1layhid5       0.5276668300586   -1.1884149700084
## Sepal.Width.to.1layhid5        0.5043242262993   -0.7815547103644
## Petal.Length.to.1layhid5      -0.8047706489112    1.5130150488383
## Petal.Width.to.1layhid5       -0.9849615921087    1.8830924859650
## Intercept.to.2layhid1         -1.6914532500827   -0.1131579344019
## 1layhid.1.to.2layhid1          5.1819424719829   -1.0748713394819
## 1layhid.2.to.2layhid1        -15.5018575074383   -1.1412128833714
## 1layhid.3.to.2layhid1         -4.1224773289966   -4.6459881039495
## 1layhid.4.to.2layhid1          2.9038529559243    3.2250993952067
## 1layhid.5.to.2layhid1         -5.3128895228453    3.1745961101735
## Intercept.to.2layhid2         -1.1883087121409    0.1133904781671
## 1layhid.1.to.2layhid2         -0.9610116476226   -2.3627523751674
## 1layhid.2.to.2layhid2         13.6405618714449    2.3219825930768
## 1layhid.3.to.2layhid2          1.8191985196488    6.0665501457863
## 1layhid.4.to.2layhid2         -1.1107491077066   -0.4807378406392
## 1layhid.5.to.2layhid2          2.1422344603721   -1.9345838016276
## Intercept.to.2layhid3         -0.1896266938834   -0.4025374941245
## 1layhid.1.to.2layhid3         -1.5755191822948    1.9032205209909
## 1layhid.2.to.2layhid3          6.0596883907606   -3.1718891949102
## 1layhid.3.to.2layhid3          0.5954293507723   -5.1015611898510
## 1layhid.4.to.2layhid3         -2.3692217173763    0.5423812595568
## 1layhid.5.to.2layhid3          1.7962147244827    2.7905277708945
```

```
## Intercept.to.3layhid1     14.1844764292839   -0.2748685054501
## 2layhid.1.to.3layhid1     29.7763619983051   20.9454076250450
## 2layhid.2.to.3layhid1     -5.3178618473656   -1.9471592831563
## 2layhid.3.to.3layhid1    -13.1567112548274   14.7068588764594
## Intercept.to.3layhid2     -0.9626238114518    1.3051065324057
## 2layhid.1.to.3layhid2      6.9115480599704  -22.3481237578333
## 2layhid.2.to.3layhid2     -7.6321396477444    1.1475613702796
## 2layhid.3.to.3layhid2     -6.6487862620401  -23.2899831283054
## Intercept.to.3layhid3     -1.5584954602488   -0.0452993059413
## 2layhid.1.to.3layhid3      8.6121470595914   -1.0211076042598
## 2layhid.2.to.3layhid3     -6.6012923548913    8.7073412372092
## 2layhid.3.to.3layhid3     -8.2601052396150   -5.9882465930920
## Intercept.to.setosa       10.6173093665100   -1.6930643436274
## 3layhid.1.to.setosa      -30.1171528042304  -20.8050818682303
## 3layhid.2.to.setosa      -27.6521862503641   21.6085795542792
## 3layhid.3.to.setosa      -26.0785707549754    1.6606309020135
## Intercept.to.versicolor   -5.9808382292891   -9.2002371915793
## 3layhid.1.to.versicolor   17.2633995543298    0.4651365892383
## 3layhid.2.to.versicolor  -13.6278794051815  -20.4671089419971
## 3layhid.3.to.versicolor  -17.7237989769035   18.3517836090087
## Intercept.to.virginica   -12.3082726221786    1.4489790596394
## 3layhid.1.to.virginica    -0.1429023193938    8.0118697349932
## 3layhid.2.to.virginica    15.8238039923927  -23.7271670780071
## 3layhid.3.to.virginica    18.4662248550821  -20.2640302303556
##                                             3
## error                      0.0006850012749
## reached.threshold          0.0072312432005
## steps                    170.0000000000000
## Intercept.to.1layhid1     -1.9129960791700
## Sepal.Length.to.1layhid1   0.3015053438159
## Sepal.Width.to.1layhid1   -0.4480338832666
## Petal.Length.to.1layhid1   0.5982346191494
## Petal.Width.to.1layhid1    1.8310308728790
## Intercept.to.1layhid2     -0.8669593332518
## Sepal.Length.to.1layhid2   1.2789987453658
## Sepal.Width.to.1layhid2    0.0008587208374
## Petal.Length.to.1layhid2  -1.2855902764886
## Petal.Width.to.1layhid2   -1.2223983518142
## Intercept.to.1layhid3     -1.5409306997649
## Sepal.Length.to.1layhid3  -0.4089830572100
## Sepal.Width.to.1layhid3   -1.3352469193810
## Petal.Length.to.1layhid3   0.9132260949364
## Petal.Width.to.1layhid3    2.3353614061396
## Intercept.to.1layhid4     -1.3648663196966
## Sepal.Length.to.1layhid4   0.5961478045346
## Sepal.Width.to.1layhid4    6.6376826700479
## Petal.Length.to.1layhid4  -7.9098263418344
## Petal.Width.to.1layhid4  -14.1819766082770
## Intercept.to.1layhid5      0.8192849773754
## Sepal.Length.to.1layhid5   0.0818880628658
## Sepal.Width.to.1layhid5    1.3703879018662
## Petal.Length.to.1layhid5  -0.9165585784029
## Petal.Width.to.1layhid5   -1.1285329670090
## Intercept.to.2layhid1     -1.1179306665563
```

```
## 1layhid.1.to.2layhid1        0.7506735795975
## 1layhid.2.to.2layhid1       -4.5286541266661
## 1layhid.3.to.2layhid1        1.7712984741469
## 1layhid.4.to.2layhid1       15.2407033337623
## 1layhid.5.to.2layhid1       -2.5272906070319
## Intercept.to.2layhid2       -1.5777424382656
## 1layhid.1.to.2layhid2        0.1087198834181
## 1layhid.2.to.2layhid2      -10.5626426162971
## 1layhid.3.to.2layhid2        5.5714251961039
## 1layhid.4.to.2layhid2        3.6367082493691
## 1layhid.5.to.2layhid2        0.1863357098105
## Intercept.to.2layhid3        3.7953942710344
## 1layhid.1.to.2layhid3        6.3390586747236
## 1layhid.2.to.2layhid3       -1.8222709809838
## 1layhid.3.to.2layhid3        8.6682018042802
## 1layhid.4.to.2layhid3      -14.8526366961216
## 1layhid.5.to.2layhid3       -2.1143480159939
## Intercept.to.3layhid1        0.3107678036150
## 2layhid.1.to.3layhid1        2.4041609088052
## 2layhid.2.to.3layhid1        7.5342224260052
## 2layhid.3.to.3layhid1       -3.3856968994171
## Intercept.to.3layhid2        2.6714018643793
## 2layhid.1.to.3layhid2       -2.4848599347930
## 2layhid.2.to.3layhid2      -12.5034462606694
## 2layhid.3.to.3layhid2        0.7210535220699
## Intercept.to.3layhid3       -3.8744802212903
## 2layhid.1.to.3layhid3       -0.7792170312419
## 2layhid.2.to.3layhid3        8.5293253560961
## 2layhid.3.to.3layhid3        3.1322484882075
## Intercept.to.setosa         -4.2808891187180
## 3layhid.1.to.setosa         11.8894589856136
## 3layhid.2.to.setosa          1.6025957872515
## 3layhid.3.to.setosa        -15.5526727498424
## Intercept.to.versicolor     -1.1042479508137
## 3layhid.1.to.versicolor    -11.8374676086586
## 3layhid.2.to.versicolor     11.0898218077908
## 3layhid.3.to.versicolor      0.6726626684461
## Intercept.to.virginica      -1.1317431790745
## 3layhid.1.to.virginica       1.6015645231611
## 3layhid.2.to.virginica     -11.6695671532362
## 3layhid.3.to.virginica       7.0778776312250
##
## attr(,"class")
## [1] "nn"
### Seems setting seed - does not work - keep getting different
# STEPS and ERROR as seen below --

# STEPS == 168
# ERROR == 0.001692


# Seen in the PLOT :-
#
```

```
# Black lines are connections between each layer,
# Figures seen on connections are weights ,
# The Circles with Figure 1 in them and the blue lines show "bias terms".
#
```

```
# Another simpler code chunk ... Basic Classifier NN

iris$Species.Class <- 0
iris$Species.Class[iris$Species == "versicolor"] <- 1
iris$Species.Class[iris$Species == "virginica"] <- 2
nn.1 <- neuralnet(Species.Class ~ Sepal.Width + Sepal.Length + Petal.Width + Petal.Length,
                  data = iris, hidden = 2)
plot(nn.1)
nn.1
```

```
## $call
## neuralnet(formula = Species.Class ~ Sepal.Width + Sepal.Length +
##     Petal.Width + Petal.Length, data = iris, hidden = 2)
##
## $response
##      Species.Class
## 1                0
## 2                0
## 3                0
## 4                0
## 5                0
## 6                0
## 7                0
## 8                0
## 9                0
## 10               0
## 11               0
## 12               0
## 13               0
## 14               0
## 15               0
## 16               0
## 17               0
## 18               0
## 19               0
## 20               0
## 21               0
## 22               0
## 23               0
## 24               0
## 25               0
## 26               0
## 27               0
## 28               0
## 29               0
## 30               0
## 31               0
## 32               0
## 33               0
```

```
## 34          0
## 35          0
## 36          0
## 37          0
## 38          0
## 39          0
## 40          0
## 41          0
## 42          0
## 43          0
## 44          0
## 45          0
## 46          0
## 47          0
## 48          0
## 49          0
## 50          0
## 51          1
## 52          1
## 53          1
## 54          1
## 55          1
## 56          1
## 57          1
## 58          1
## 59          1
## 60          1
## 61          1
## 62          1
## 63          1
## 64          1
## 65          1
## 66          1
## 67          1
## 68          1
## 69          1
## 70          1
## 71          1
## 72          1
## 73          1
## 74          1
## 75          1
## 76          1
## 77          1
## 78          1
## 79          1
## 80          1
## 81          1
## 82          1
## 83          1
## 84          1
## 85          1
## 86          1
## 87          1
```

```
## 88            1
## 89            1
## 90            1
## 91            1
## 92            1
## 93            1
## 94            1
## 95            1
## 96            1
## 97            1
## 98            1
## 99            1
## 100           1
## 101           2
## 102           2
## 103           2
## 104           2
## 105           2
## 106           2
## 107           2
## 108           2
## 109           2
## 110           2
## 111           2
## 112           2
## 113           2
## 114           2
## 115           2
## 116           2
## 117           2
## 118           2
## 119           2
## 120           2
## 121           2
## 122           2
## 123           2
## 124           2
## 125           2
## 126           2
## 127           2
## 128           2
## 129           2
## 130           2
## 131           2
## 132           2
## 133           2
## 134           2
## 135           2
## 136           2
## 137           2
## 138           2
## 139           2
## 140           2
## 141           2
```

```
## 142               2
## 143               2
## 144               2
## 145               2
## 146               2
## 147               2
## 148               2
## 149               2
## 150               2
##
## $covariate
##           [,1] [,2] [,3] [,4]
##    [1,]   3.5  5.1  0.2  1.4
##    [2,]   3.0  4.9  0.2  1.4
##    [3,]   3.2  4.7  0.2  1.3
##    [4,]   3.1  4.6  0.2  1.5
##    [5,]   3.6  5.0  0.2  1.4
##    [6,]   3.9  5.4  0.4  1.7
##    [7,]   3.4  4.6  0.3  1.4
##    [8,]   3.4  5.0  0.2  1.5
##    [9,]   2.9  4.4  0.2  1.4
##   [10,]   3.1  4.9  0.1  1.5
##   [11,]   3.7  5.4  0.2  1.5
##   [12,]   3.4  4.8  0.2  1.6
##   [13,]   3.0  4.8  0.1  1.4
##   [14,]   3.0  4.3  0.1  1.1
##   [15,]   4.0  5.8  0.2  1.2
##   [16,]   4.4  5.7  0.4  1.5
##   [17,]   3.9  5.4  0.4  1.3
##   [18,]   3.5  5.1  0.3  1.4
##   [19,]   3.8  5.7  0.3  1.7
##   [20,]   3.8  5.1  0.3  1.5
##   [21,]   3.4  5.4  0.2  1.7
##   [22,]   3.7  5.1  0.4  1.5
##   [23,]   3.6  4.6  0.2  1.0
##   [24,]   3.3  5.1  0.5  1.7
##   [25,]   3.4  4.8  0.2  1.9
##   [26,]   3.0  5.0  0.2  1.6
##   [27,]   3.4  5.0  0.4  1.6
##   [28,]   3.5  5.2  0.2  1.5
##   [29,]   3.4  5.2  0.2  1.4
##   [30,]   3.2  4.7  0.2  1.6
##   [31,]   3.1  4.8  0.2  1.6
##   [32,]   3.4  5.4  0.4  1.5
##   [33,]   4.1  5.2  0.1  1.5
##   [34,]   4.2  5.5  0.2  1.4
##   [35,]   3.1  4.9  0.2  1.5
##   [36,]   3.2  5.0  0.2  1.2
##   [37,]   3.5  5.5  0.2  1.3
##   [38,]   3.6  4.9  0.1  1.4
##   [39,]   3.0  4.4  0.2  1.3
##   [40,]   3.4  5.1  0.2  1.5
##   [41,]   3.5  5.0  0.3  1.3
##   [42,]   2.3  4.5  0.3  1.3
```

```
## [43,]  3.2  4.4  0.2  1.3
## [44,]  3.5  5.0  0.6  1.6
## [45,]  3.8  5.1  0.4  1.9
## [46,]  3.0  4.8  0.3  1.4
## [47,]  3.8  5.1  0.2  1.6
## [48,]  3.2  4.6  0.2  1.4
## [49,]  3.7  5.3  0.2  1.5
## [50,]  3.3  5.0  0.2  1.4
## [51,]  3.2  7.0  1.4  4.7
## [52,]  3.2  6.4  1.5  4.5
## [53,]  3.1  6.9  1.5  4.9
## [54,]  2.3  5.5  1.3  4.0
## [55,]  2.8  6.5  1.5  4.6
## [56,]  2.8  5.7  1.3  4.5
## [57,]  3.3  6.3  1.6  4.7
## [58,]  2.4  4.9  1.0  3.3
## [59,]  2.9  6.6  1.3  4.6
## [60,]  2.7  5.2  1.4  3.9
## [61,]  2.0  5.0  1.0  3.5
## [62,]  3.0  5.9  1.5  4.2
## [63,]  2.2  6.0  1.0  4.0
## [64,]  2.9  6.1  1.4  4.7
## [65,]  2.9  5.6  1.3  3.6
## [66,]  3.1  6.7  1.4  4.4
## [67,]  3.0  5.6  1.5  4.5
## [68,]  2.7  5.8  1.0  4.1
## [69,]  2.2  6.2  1.5  4.5
## [70,]  2.5  5.6  1.1  3.9
## [71,]  3.2  5.9  1.8  4.8
## [72,]  2.8  6.1  1.3  4.0
## [73,]  2.5  6.3  1.5  4.9
## [74,]  2.8  6.1  1.2  4.7
## [75,]  2.9  6.4  1.3  4.3
## [76,]  3.0  6.6  1.4  4.4
## [77,]  2.8  6.8  1.4  4.8
## [78,]  3.0  6.7  1.7  5.0
## [79,]  2.9  6.0  1.5  4.5
## [80,]  2.6  5.7  1.0  3.5
## [81,]  2.4  5.5  1.1  3.8
## [82,]  2.4  5.5  1.0  3.7
## [83,]  2.7  5.8  1.2  3.9
## [84,]  2.7  6.0  1.6  5.1
## [85,]  3.0  5.4  1.5  4.5
## [86,]  3.4  6.0  1.6  4.5
## [87,]  3.1  6.7  1.5  4.7
## [88,]  2.3  6.3  1.3  4.4
## [89,]  3.0  5.6  1.3  4.1
## [90,]  2.5  5.5  1.3  4.0
## [91,]  2.6  5.5  1.2  4.4
## [92,]  3.0  6.1  1.4  4.6
## [93,]  2.6  5.8  1.2  4.0
## [94,]  2.3  5.0  1.0  3.3
## [95,]  2.7  5.6  1.3  4.2
## [96,]  3.0  5.7  1.2  4.2
```

```
##  [97,]  2.9  5.7  1.3  4.2
##  [98,]  2.9  6.2  1.3  4.3
##  [99,]  2.5  5.1  1.1  3.0
## [100,]  2.8  5.7  1.3  4.1
## [101,]  3.3  6.3  2.5  6.0
## [102,]  2.7  5.8  1.9  5.1
## [103,]  3.0  7.1  2.1  5.9
## [104,]  2.9  6.3  1.8  5.6
## [105,]  3.0  6.5  2.2  5.8
## [106,]  3.0  7.6  2.1  6.6
## [107,]  2.5  4.9  1.7  4.5
## [108,]  2.9  7.3  1.8  6.3
## [109,]  2.5  6.7  1.8  5.8
## [110,]  3.6  7.2  2.5  6.1
## [111,]  3.2  6.5  2.0  5.1
## [112,]  2.7  6.4  1.9  5.3
## [113,]  3.0  6.8  2.1  5.5
## [114,]  2.5  5.7  2.0  5.0
## [115,]  2.8  5.8  2.4  5.1
## [116,]  3.2  6.4  2.3  5.3
## [117,]  3.0  6.5  1.8  5.5
## [118,]  3.8  7.7  2.2  6.7
## [119,]  2.6  7.7  2.3  6.9
## [120,]  2.2  6.0  1.5  5.0
## [121,]  3.2  6.9  2.3  5.7
## [122,]  2.8  5.6  2.0  4.9
## [123,]  2.8  7.7  2.0  6.7
## [124,]  2.7  6.3  1.8  4.9
## [125,]  3.3  6.7  2.1  5.7
## [126,]  3.2  7.2  1.8  6.0
## [127,]  2.8  6.2  1.8  4.8
## [128,]  3.0  6.1  1.8  4.9
## [129,]  2.8  6.4  2.1  5.6
## [130,]  3.0  7.2  1.6  5.8
## [131,]  2.8  7.4  1.9  6.1
## [132,]  3.8  7.9  2.0  6.4
## [133,]  2.8  6.4  2.2  5.6
## [134,]  2.8  6.3  1.5  5.1
## [135,]  2.6  6.1  1.4  5.6
## [136,]  3.0  7.7  2.3  6.1
## [137,]  3.4  6.3  2.4  5.6
## [138,]  3.1  6.4  1.8  5.5
## [139,]  3.0  6.0  1.8  4.8
## [140,]  3.1  6.9  2.1  5.4
## [141,]  3.1  6.7  2.4  5.6
## [142,]  3.1  6.9  2.3  5.1
## [143,]  2.7  5.8  1.9  5.1
## [144,]  3.2  6.8  2.3  5.9
## [145,]  3.3  6.7  2.5  5.7
## [146,]  3.0  6.7  2.3  5.2
## [147,]  2.5  6.3  1.9  5.0
## [148,]  3.0  6.5  2.0  5.2
## [149,]  3.4  6.2  2.3  5.4
## [150,]  3.0  5.9  1.8  5.1
```

```
##
## $model.list
## $model.list$response
## [1] "Species.Class"
##
## $model.list$variables
## [1] "Sepal.Width"  "Sepal.Length" "Petal.Width"  "Petal.Length"
##
##
## $err.fct
## function (x, y)
## {
##     1/2 * (y - x)^2
## }
## <bytecode: 0x2964878>
## <environment: 0x38ba020>
## attr(,"type")
## [1] "sse"
##
## $act.fct
## function (x)
## {
##     1/(1 + exp(-x))
## }
## <bytecode: 0x392d3f8>
## <environment: 0x38ba020>
## attr(,"type")
## [1] "logistic"
##
## $linear.output
## [1] TRUE
##
## $data
##    Sepal.Length Sepal.Width Petal.Length Petal.Width   Species
## 1           5.1         3.5          1.4         0.2    setosa
## 2           4.9         3.0          1.4         0.2    setosa
## 3           4.7         3.2          1.3         0.2    setosa
## 4           4.6         3.1          1.5         0.2    setosa
## 5           5.0         3.6          1.4         0.2    setosa
## 6           5.4         3.9          1.7         0.4    setosa
## 7           4.6         3.4          1.4         0.3    setosa
## 8           5.0         3.4          1.5         0.2    setosa
## 9           4.4         2.9          1.4         0.2    setosa
## 10          4.9         3.1          1.5         0.1    setosa
## 11          5.4         3.7          1.5         0.2    setosa
## 12          4.8         3.4          1.6         0.2    setosa
## 13          4.8         3.0          1.4         0.1    setosa
## 14          4.3         3.0          1.1         0.1    setosa
## 15          5.8         4.0          1.2         0.2    setosa
## 16          5.7         4.4          1.5         0.4    setosa
## 17          5.4         3.9          1.3         0.4    setosa
## 18          5.1         3.5          1.4         0.3    setosa
## 19          5.7         3.8          1.7         0.3    setosa
## 20          5.1         3.8          1.5         0.3    setosa
```

```
## 21           5.4         3.4         1.7         0.2      setosa
## 22           5.1         3.7         1.5         0.4      setosa
## 23           4.6         3.6         1.0         0.2      setosa
## 24           5.1         3.3         1.7         0.5      setosa
## 25           4.8         3.4         1.9         0.2      setosa
## 26           5.0         3.0         1.6         0.2      setosa
## 27           5.0         3.4         1.6         0.4      setosa
## 28           5.2         3.5         1.5         0.2      setosa
## 29           5.2         3.4         1.4         0.2      setosa
## 30           4.7         3.2         1.6         0.2      setosa
## 31           4.8         3.1         1.6         0.2      setosa
## 32           5.4         3.4         1.5         0.4      setosa
## 33           5.2         4.1         1.5         0.1      setosa
## 34           5.5         4.2         1.4         0.2      setosa
## 35           4.9         3.1         1.5         0.2      setosa
## 36           5.0         3.2         1.2         0.2      setosa
## 37           5.5         3.5         1.3         0.2      setosa
## 38           4.9         3.6         1.4         0.1      setosa
## 39           4.4         3.0         1.3         0.2      setosa
## 40           5.1         3.4         1.5         0.2      setosa
## 41           5.0         3.5         1.3         0.3      setosa
## 42           4.5         2.3         1.3         0.3      setosa
## 43           4.4         3.2         1.3         0.2      setosa
## 44           5.0         3.5         1.6         0.6      setosa
## 45           5.1         3.8         1.9         0.4      setosa
## 46           4.8         3.0         1.4         0.3      setosa
## 47           5.1         3.8         1.6         0.2      setosa
## 48           4.6         3.2         1.4         0.2      setosa
## 49           5.3         3.7         1.5         0.2      setosa
## 50           5.0         3.3         1.4         0.2      setosa
## 51           7.0         3.2         4.7         1.4 versicolor
## 52           6.4         3.2         4.5         1.5 versicolor
## 53           6.9         3.1         4.9         1.5 versicolor
## 54           5.5         2.3         4.0         1.3 versicolor
## 55           6.5         2.8         4.6         1.5 versicolor
## 56           5.7         2.8         4.5         1.3 versicolor
## 57           6.3         3.3         4.7         1.6 versicolor
## 58           4.9         2.4         3.3         1.0 versicolor
## 59           6.6         2.9         4.6         1.3 versicolor
## 60           5.2         2.7         3.9         1.4 versicolor
## 61           5.0         2.0         3.5         1.0 versicolor
## 62           5.9         3.0         4.2         1.5 versicolor
## 63           6.0         2.2         4.0         1.0 versicolor
## 64           6.1         2.9         4.7         1.4 versicolor
## 65           5.6         2.9         3.6         1.3 versicolor
## 66           6.7         3.1         4.4         1.4 versicolor
## 67           5.6         3.0         4.5         1.5 versicolor
## 68           5.8         2.7         4.1         1.0 versicolor
## 69           6.2         2.2         4.5         1.5 versicolor
## 70           5.6         2.5         3.9         1.1 versicolor
## 71           5.9         3.2         4.8         1.8 versicolor
## 72           6.1         2.8         4.0         1.3 versicolor
## 73           6.3         2.5         4.9         1.5 versicolor
## 74           6.1         2.8         4.7         1.2 versicolor
```

```
## 75           6.4           2.9           4.3           1.3 versicolor
## 76           6.6           3.0           4.4           1.4 versicolor
## 77           6.8           2.8           4.8           1.4 versicolor
## 78           6.7           3.0           5.0           1.7 versicolor
## 79           6.0           2.9           4.5           1.5 versicolor
## 80           5.7           2.6           3.5           1.0 versicolor
## 81           5.5           2.4           3.8           1.1 versicolor
## 82           5.5           2.4           3.7           1.0 versicolor
## 83           5.8           2.7           3.9           1.2 versicolor
## 84           6.0           2.7           5.1           1.6 versicolor
## 85           5.4           3.0           4.5           1.5 versicolor
## 86           6.0           3.4           4.5           1.6 versicolor
## 87           6.7           3.1           4.7           1.5 versicolor
## 88           6.3           2.3           4.4           1.3 versicolor
## 89           5.6           3.0           4.1           1.3 versicolor
## 90           5.5           2.5           4.0           1.3 versicolor
## 91           5.5           2.6           4.4           1.2 versicolor
## 92           6.1           3.0           4.6           1.4 versicolor
## 93           5.8           2.6           4.0           1.2 versicolor
## 94           5.0           2.3           3.3           1.0 versicolor
## 95           5.6           2.7           4.2           1.3 versicolor
## 96           5.7           3.0           4.2           1.2 versicolor
## 97           5.7           2.9           4.2           1.3 versicolor
## 98           6.2           2.9           4.3           1.3 versicolor
## 99           5.1           2.5           3.0           1.1 versicolor
## 100          5.7           2.8           4.1           1.3 versicolor
## 101          6.3           3.3           6.0           2.5  virginica
## 102          5.8           2.7           5.1           1.9  virginica
## 103          7.1           3.0           5.9           2.1  virginica
## 104          6.3           2.9           5.6           1.8  virginica
## 105          6.5           3.0           5.8           2.2  virginica
## 106          7.6           3.0           6.6           2.1  virginica
## 107          4.9           2.5           4.5           1.7  virginica
## 108          7.3           2.9           6.3           1.8  virginica
## 109          6.7           2.5           5.8           1.8  virginica
## 110          7.2           3.6           6.1           2.5  virginica
## 111          6.5           3.2           5.1           2.0  virginica
## 112          6.4           2.7           5.3           1.9  virginica
## 113          6.8           3.0           5.5           2.1  virginica
## 114          5.7           2.5           5.0           2.0  virginica
## 115          5.8           2.8           5.1           2.4  virginica
## 116          6.4           3.2           5.3           2.3  virginica
## 117          6.5           3.0           5.5           1.8  virginica
## 118          7.7           3.8           6.7           2.2  virginica
## 119          7.7           2.6           6.9           2.3  virginica
## 120          6.0           2.2           5.0           1.5  virginica
## 121          6.9           3.2           5.7           2.3  virginica
## 122          5.6           2.8           4.9           2.0  virginica
## 123          7.7           2.8           6.7           2.0  virginica
## 124          6.3           2.7           4.9           1.8  virginica
## 125          6.7           3.3           5.7           2.1  virginica
## 126          7.2           3.2           6.0           1.8  virginica
## 127          6.2           2.8           4.8           1.8  virginica
## 128          6.1           3.0           4.9           1.8  virginica
```

```
## 129           6.4          2.8          5.6          2.1  virginica
## 130           7.2          3.0          5.8          1.6  virginica
## 131           7.4          2.8          6.1          1.9  virginica
## 132           7.9          3.8          6.4          2.0  virginica
## 133           6.4          2.8          5.6          2.2  virginica
## 134           6.3          2.8          5.1          1.5  virginica
## 135           6.1          2.6          5.6          1.4  virginica
## 136           7.7          3.0          6.1          2.3  virginica
## 137           6.3          3.4          5.6          2.4  virginica
## 138           6.4          3.1          5.5          1.8  virginica
## 139           6.0          3.0          4.8          1.8  virginica
## 140           6.9          3.1          5.4          2.1  virginica
## 141           6.7          3.1          5.6          2.4  virginica
## 142           6.9          3.1          5.1          2.3  virginica
## 143           5.8          2.7          5.1          1.9  virginica
## 144           6.8          3.2          5.9          2.3  virginica
## 145           6.7          3.3          5.7          2.5  virginica
## 146           6.7          3.0          5.2          2.3  virginica
## 147           6.3          2.5          5.0          1.9  virginica
## 148           6.5          3.0          5.2          2.0  virginica
## 149           6.2          3.4          5.4          2.3  virginica
## 150           5.9          3.0          5.1          1.8  virginica
##      Species.Class
## 1                0
## 2                0
## 3                0
## 4                0
## 5                0
## 6                0
## 7                0
## 8                0
## 9                0
## 10               0
## 11               0
## 12               0
## 13               0
## 14               0
## 15               0
## 16               0
## 17               0
## 18               0
## 19               0
## 20               0
## 21               0
## 22               0
## 23               0
## 24               0
## 25               0
## 26               0
## 27               0
## 28               0
## 29               0
## 30               0
## 31               0
```

```
## 32                0
## 33                0
## 34                0
## 35                0
## 36                0
## 37                0
## 38                0
## 39                0
## 40                0
## 41                0
## 42                0
## 43                0
## 44                0
## 45                0
## 46                0
## 47                0
## 48                0
## 49                0
## 50                0
## 51                1
## 52                1
## 53                1
## 54                1
## 55                1
## 56                1
## 57                1
## 58                1
## 59                1
## 60                1
## 61                1
## 62                1
## 63                1
## 64                1
## 65                1
## 66                1
## 67                1
## 68                1
## 69                1
## 70                1
## 71                1
## 72                1
## 73                1
## 74                1
## 75                1
## 76                1
## 77                1
## 78                1
## 79                1
## 80                1
## 81                1
## 82                1
## 83                1
## 84                1
## 85                1
```

```
## 86               1
## 87               1
## 88               1
## 89               1
## 90               1
## 91               1
## 92               1
## 93               1
## 94               1
## 95               1
## 96               1
## 97               1
## 98               1
## 99               1
## 100              1
## 101              2
## 102              2
## 103              2
## 104              2
## 105              2
## 106              2
## 107              2
## 108              2
## 109              2
## 110              2
## 111              2
## 112              2
## 113              2
## 114              2
## 115              2
## 116              2
## 117              2
## 118              2
## 119              2
## 120              2
## 121              2
## 122              2
## 123              2
## 124              2
## 125              2
## 126              2
## 127              2
## 128              2
## 129              2
## 130              2
## 131              2
## 132              2
## 133              2
## 134              2
## 135              2
## 136              2
## 137              2
## 138              2
## 139              2
```

```
## 140                     2
## 141                     2
## 142                     2
## 143                     2
## 144                     2
## 145                     2
## 146                     2
## 147                     2
## 148                     2
## 149                     2
## 150                     2
##
## $net.result
## $net.result[[1]]
##                     [,1]
## 1    -0.003145932243
## 2     0.017408453262
## 3     0.009028860363
## 4     0.023110078144
## 5    -0.004724227239
## 6     0.001968510854
## 7     0.014607535080
## 8     0.004322616852
## 9     0.032453067201
## 10    0.009285069326
## 11   -0.009230477212
## 12    0.010942458164
## 13    0.010984296395
## 14    0.008097452151
## 15   -0.023581707403
## 16   -0.018112613756
## 17   -0.009012254651
## 18    0.003035321568
## 19   -0.004898440240
## 20   -0.003124083000
## 21    0.005097122084
## 22    0.006447208814
## 23   -0.010275474745
## 24    0.043681888552
## 25    0.023382084268
## 26    0.024269259215
## 27    0.024518573270
## 28   -0.001559367672
## 29   -0.001504280358
## 30    0.021041857260
## 31    0.023643558094
## 32    0.012766287540
## 33   -0.019697496845
## 34   -0.021719897877
## 35    0.017329099801
## 36    0.001253393594
## 37   -0.010175010112
## 38   -0.008842337416
## 39    0.022666759930
```

```
## 40    0.002888440474
## 41    0.001277588904
## 42    0.076290855329
## 43    0.014038113745
## 44    0.040590965278
## 45    0.017803329164
## 46    0.028806828047
## 47   -0.005989276527
## 48    0.014500543562
## 49   -0.008166617951
## 50    0.004385302465
## 51    0.943853481137
## 52    1.058916346759
## 53    1.180453426377
## 54    1.232808408406
## 55    1.259561441051
## 56    1.190345611914
## 57    1.209849181444
## 58    0.750769202652
## 59    1.018026272294
## 60    1.159630476966
## 61    0.977515953403
## 62    1.112651890326
## 63    0.916782374418
## 64    1.245834729935
## 65    0.789458901321
## 66    0.916632907887
## 67    1.300033540458
## 68    0.787905946930
## 69    1.530049248890
## 70    0.907492783925
## 71    1.543219285215
## 72    0.901907453453
## 73    1.550042177615
## 74    1.110922703240
## 75    0.928980400570
## 76    0.977598903746
## 77    1.199290539446
## 78    1.480140748895
## 79    1.267760581641
## 80    0.621743218019
## 81    0.926522433160
## 82    0.802806510969
## 83    0.872492198468
## 84    1.678029038210
## 85    1.337956801106
## 86    1.136340512741
## 87    1.132015342856
## 88    1.253014273767
## 89    0.950412821970
## 90    1.144362560700
## 91    1.184118843525
## 92    1.158223344890
## 93    0.955756448378
```

```
## 94     0.772823138155
## 95     1.123575995980
## 96     0.888147339227
## 97     1.016979037548
## 98     0.965861275847
## 99     0.647164328039
## 100    1.017788349356
## 101    2.188003299025
## 102    1.909190902445
## 103    1.997851200125
## 104    1.870710423480
## 105    2.081879381426
## 106    2.103448458583
## 107    1.781663279607
## 108    1.944566072903
## 109    1.989573243445
## 110    2.081643366975
## 111    1.712508523150
## 112    1.890363549213
## 113    1.927668014743
## 114    2.003112571230
## 115    2.125802108673
## 116    1.977312770861
## 117    1.778402959196
## 118    1.979329884929
## 119    2.261251132713
## 120    1.750099638027
## 121    2.021388083431
## 122    1.907167296799
## 123    2.113660543835
## 124    1.707116307057
## 125    1.910340313077
## 126    1.774042262140
## 127    1.649470094885
## 128    1.627028182416
## 129    2.047883866217
## 130    1.627462496532
## 131    1.961712472857
## 132    1.737213177676
## 133    2.091641393205
## 134    1.507653295975
## 135    1.729869983927
## 136    2.076994982568
## 137    2.059383118577
## 138    1.758892915522
## 139    1.605710403425
## 140    1.855699929091
## 141    2.086534439142
## 142    1.889625227099
## 143    1.909190902445
## 144    2.075687496255
## 145    2.106897122426
## 146    1.969906200109
## 147    1.874941536496
```

```
## 148   1.815489684956
## 149   1.973336719882
## 150   1.732209207962
##
##
## $weights
## $weights[[1]]
## $weights[[1]][[1]]
##               [,1]        [,2]
## [1,] -1.2753406936 2.611397162
## [2,] -0.7181684688 2.805382733
## [3,] -0.3113060000 5.050907467
## [4,]  1.4552548540 3.014371875
## [5,]  0.7047720590 3.519245236
##
## $weights[[1]][[2]]
##               [,1]
## [1,]  0.3581941801
## [2,]  2.4641532928
## [3,] -0.4015570804
##
##
##
## $startweights
## $startweights[[1]]
## $startweights[[1]][[1]]
##               [,1]            [,2]
## [1,]  1.3124129764 -0.78860283785
## [2,] -0.2651450567 -0.59461726746
## [3,]  0.5431940592  1.65090746734
## [4,] -0.4143399479 -0.05402812509
## [5,] -0.4762468946  0.11924523643
##
## $startweights[[1]][[2]]
##               [,1]
## [1,]  0.2436874296
## [2,]  1.2324758785
## [3,] -0.5160638309
##
##
##
## $generalized.weights
## $generalized.weights[[1]]
##              [,1]           [,2]           [,3]           [,4]
## 1      9.00275982364   3.90244527713 -18.24266937476  -8.83482616292
## 2     -2.48855420774  -1.07871883790   5.04266164179   2.44213377376
## 3     -4.11587357487  -1.78411639410   8.34016704716   4.03909781610
## 4     -2.05753856947  -0.89188558067   4.16927659784   2.01915811828
## 5      5.75449289169   2.49441216331 -11.66057001396  -5.64715102366
## 6    -16.26595931749  -7.05083967140  32.96039477950  15.96254101613
## 7     -2.82427919983  -1.22424625788   5.72295525747   2.77159629434
## 8     -7.80298428865  -3.38237604704  15.81151394714   7.65743073154
## 9     -1.68068827304  -0.72853148834   3.40564905514   1.64933742732
## 10    -4.02248659350  -1.74363574244   8.15093309464   3.94745283584
```

```
## 11     2.59490357357    1.12481832168    -5.25816181697    -2.54649934366
## 12    -3.52415078277   -1.52762106816     7.14113436505     3.45841276982
## 13    -3.51351998048   -1.52301291188     7.11959272501     3.44798027000
## 14    -4.50522023011   -1.95288730943     9.12911648521     4.42118176409
## 15     0.58382225422    0.25307066314    -1.18302349124    -0.57293188168
## 16     0.97329055211    0.42189430716    -1.97221941888    -0.95513520324
## 17     2.67506673972    1.15956681828    -5.42059979873    -2.62516718013
## 18   -10.80407952808   -4.68326712631    21.89275895284    10.60254481412
## 19     5.52425038937    2.39460846052   -11.19401998619    -5.42120336726
## 20     9.07076448385    3.93192340054   -18.38047006660    -8.90156229307
## 21    -6.72788081032   -2.91634867615    13.63298673070     6.60238177719
## 22    -5.47157583976   -2.37177551247    11.08728333967     5.36951138634
## 23     2.25827386460    0.97889873217    -4.57603493558    -2.21614898241
## 24    -1.44359911306   -0.62575995042     2.92522535813     1.41667082791
## 25    -2.04226148322   -0.88526338989     4.13831999797     2.00416600430
## 26    -1.99483335715   -0.86470462011     4.04221439927     1.95762258237
## 27    -1.98212826196   -0.85919731572     4.01646953265     1.94515448264
## 28    18.89658052366    8.19114059056   -38.29093273168   -18.54409173082
## 29    19.61502640515    8.50256684118   -39.74674971851   -19.24913602777
## 30    -2.18672466590   -0.94788415019     4.43105179690     2.14593443209
## 31    -2.02791003089   -0.87904243560     4.10923904890     1.99008225787
## 32    -3.12552948958   -1.35482985597     6.33339133960     3.06722718905
## 33     0.83804393759    0.36326867209    -1.69816353813    -0.82241142167
## 34     0.69426119534    0.30094286374    -1.40681054414    -0.68131074167
## 35    -2.49656625351   -1.08219183627     5.05889678577     2.44999636623
## 36   -25.13284104393  -10.89438558332    50.92772867368    24.66402369420
## 37     2.28762884631    0.99162329797    -4.63551816476    -2.24495638875
## 38     2.74022817246    1.18781248188    -5.55263913965    -2.68911311916
## 39    -2.08322955695   -0.90302190717     4.22133532202     2.04436987698
## 40   -11.31656055880   -4.90541335893    22.93122073428    11.10546624121
## 41   -24.67059110960  -10.69401312994    49.99105226713    24.21039637395
## 42    -1.16018533305   -0.50290798180     2.35093214290     1.13854372826
## 43    -2.90897965855   -1.26096154426     5.89458734526     2.85471678666
## 44    -1.49547608679   -0.64824717156     3.03034584322     1.46758011059
## 45    -2.44975174171   -1.06189905116     4.96403457935     2.40405511246
## 46    -1.79833589611   -0.77952845149     3.64404336228     1.76479050157
## 47     4.38719009673    1.90172453872    -8.88994708141    -4.30535331471
## 48    -2.83968493572   -1.23092421469     5.75417254549     2.78671465818
## 49     3.02622128264    1.31178251818    -6.13215895964    -2.96977143525
## 50    -7.70184068874   -3.33853311760    15.60656243352     7.55817382141
## 51    -8.01872820122   -3.47589501558    16.24868487514     7.86915024874
## 52     7.01277207636    3.03984109374   -14.21027383776    -6.88195880247
## 53     2.07682810522    0.90024705639    -4.20836379220    -2.03808783521
## 54     1.53951240783    0.66733568847    -3.11957848532    -1.51079499679
## 55     1.34876451373    0.58465179675    -2.73305803668    -1.32360523294
## 56     1.95261830832    0.84640557391    -3.95667227734    -1.91619499514
## 57     1.74207853721    0.75514245555    -3.53004671920    -1.70958254357
## 58    -2.06569020695   -0.89541908815     4.18579460235     2.02715769857
## 59    23.64574496482   10.24977091135   -47.91436359107   -23.20466727419
## 60     2.38867231054    1.03542282139    -4.84026676925    -2.34411503108
## 61   -19.53814865898   -8.46924248250    39.59096912088    19.17369232645
## 62     3.51623536319    1.52418995455    -7.12509501876    -3.45064500112
## 63    -5.51650653911   -2.39125171742    11.17832829799     5.41360396749
## 64     1.44143783948    0.62482309860    -2.92084587893    -1.41454986981
```

123

```
## 65    -2.38224545382   -1.03263695826    4.82724376023    2.33780805822
## 66    -5.50720394587   -2.38721930272   11.15947806360    5.40447490088
## 67     1.12499306241    0.48765311407   -2.27962057063   -1.10400791930
## 68    -2.36729673657   -1.02615710629    4.79695254825    2.32313818800
## 69     0.50365249640    0.21831930923   -1.02057215250   -0.49425757650
## 70    -4.99549781260   -2.16540896654   10.12258648935    4.90231391664
## 71     0.48406165394    0.20982722546   -0.98087440771   -0.47503217329
## 72    -4.72978030153   -2.05022783692    9.58415196520    4.64155298724
## 73     0.47428336580    0.20558861029   -0.96106025283   -0.46543628520
## 74     3.57597960649    1.55008741762   -7.24615728177   -3.50927480066
## 75    -6.40777096617   -2.77758998726   12.98433474343    6.28824312620
## 76   -19.60929986056   -8.50008454383   39.73514578133   19.24351630372
## 77     1.85093414443    0.80232832506   -3.75062539628   -1.81640760449
## 78     0.58770370092    0.25475316202   -1.19088862929   -0.57674092552
## 79     1.29795267142    0.56262628036   -2.63009587200   -1.27374121317
## 80    -1.48284011504   -0.64276983026    3.00474104432    1.45517984489
## 81    -6.20435705135   -2.68941572884   12.57214860641    6.08862360822
## 82    -2.52049980003   -1.09256636113    5.10739433371    2.47348346653
## 83    -3.71485337439   -1.61028532252    7.52756301538    3.64555807624
## 84     0.32752157240    0.14197146635   -0.66367068271   -0.32141212400
## 85     0.96407596526    0.41790004078   -1.95354751553   -0.94609250138
## 86     2.85046161521    1.23559560466   -5.77600978259   -2.79729031406
## 87     2.95417799005    1.28055376028   -5.98617461782   -2.89907200766
## 88     1.39170932265    0.60326717359   -2.82007890205   -1.36574896763
## 89    -9.03637371983   -3.91701596356   18.31078262075    8.86781303975
## 90     2.67456234500    1.15934817724   -5.41957772258   -2.62467219418
## 91     2.02924503720    0.87962112360   -4.11194422813   -1.99139236155
## 92     2.41271005967    1.04584251517   -4.88897546729   -2.36770439024
## 93   -10.08849654398   -4.37308186186   20.44274317493    9.90031001130
## 94    -2.23281190562   -0.96786168314    4.52444030143    2.19116198000
## 95     3.17747334528    1.37734606858   -6.43864735043   -3.11820210611
## 96    -4.18847500125   -1.81558708743    8.48728235886    4.11034496629
## 97    25.12396801446   10.89053937253  -50.90974888234  -24.65531617845
## 98   -12.97854634247   -5.62583783977   26.29897215173   12.73645004747
## 99    -1.56319956501   -0.67760341042    3.16757676423    1.53404030379
## 100   23.96630489436   10.38872469970  -48.56392760520  -23.51924761485
## 101    0.05824018434    0.02524549547   -0.11801452532   -0.05715379666
## 102    0.16772093974    0.07270234928   -0.33985996637   -0.16459234451
## 103    0.12621070150    0.05470881881   -0.25574603167   -0.12385642064
## 104    0.18839210711    0.08166272377   -0.38174681876   -0.18487792070
## 105    0.09320051899    0.04039982542   -0.18885611599   -0.09146199607
## 106    0.08554527632    0.03708149124   -0.17334397707   -0.08394955104
## 107    0.24410103040    0.10581098817   -0.49463214379   -0.23954767338
## 108    0.15021593272    0.06511441699   -0.30438883732   -0.14741386847
## 109    0.12976886241    0.05625118232   -0.26295608218   -0.12734820912
## 110    0.09328598926    0.04043687440   -0.18902930799   -0.09154587201
## 111    0.29705347847    0.12876439745   -0.60193190760   -0.29151236896
## 112    0.17760960052    0.07698880791   -0.35989777396   -0.17429654641
## 113    0.15840975976    0.06866621247   -0.32099233231   -0.15545485134
## 114    0.12397997400    0.05374186066   -0.25122581509   -0.12166730418
## 115    0.07792397139    0.03377786813   -0.15790060763   -0.07647041070
## 116    0.13515060347    0.05858401696   -0.27386132955   -0.13262956148
## 117    0.24638459870    0.10680085134   -0.49925943389   -0.24178864496
## 118    0.13425584623    0.05819616466   -0.27204824548   -0.13175149466
```

```
## 119   0.03757283974   0.01628677804  -0.07613541917  -0.03687197193
## 120   0.26704934091   0.11575844070  -0.54113326672  -0.26206791584
## 121   0.11641163191   0.05046119546  -0.23588976646  -0.11424013874
## 122   0.16876394070   0.07315446110  -0.34197344291  -0.16561588978
## 123   0.08202522486   0.03555564711  -0.16621114933  -0.08049516113
## 124   0.30162096984   0.13074427756  -0.61118720671  -0.29599466028
## 125   0.16713059638   0.07244645190  -0.33866372888  -0.16401301317
## 126   0.24946918963   0.10813793547  -0.50550986971  -0.24481569724
## 127   0.35522529438   0.15398025711  -0.71980789513  -0.34859907251
## 128   0.37877827093   0.16418981550  -0.76753427818  -0.37171270183
## 129   0.10591205637   0.04590992232  -0.21461403671  -0.10393641783
## 130   0.37830636061   0.16398525554  -0.76657802653  -0.37124959432
## 131   0.14219853362   0.06163909810  -0.28814284567  -0.13954602253
## 132   0.27698772293   0.12006645210  -0.56127182656  -0.27182091151
## 133   0.08969798375   0.03888157409  -0.18175878211  -0.08802479563
## 134   0.53931467750   0.23377787005  -1.09283592402  -0.52925453041
## 135   0.28280914140   0.12258987464  -0.57306801067  -0.27753373971
## 136   0.09497706129   0.04116990696  -0.19245599808  -0.09320539950
## 137   0.10152012042   0.04400614059  -0.20571447289  -0.09962640718
## 138   0.26046290208   0.11290340318  -0.52778688981  -0.25560433765
## 139   0.40277875022   0.17459335385  -0.81616745480  -0.39526548636
## 140   0.19696391880   0.08537836505  -0.39911623989  -0.19328983746
## 141   0.09152239587   0.03967240585  -0.18545566481  -0.08981517594
## 142   0.17800598979   0.07716063160  -0.36070099415  -0.17468554161
## 143   0.16772093974   0.07270234928  -0.33985996637  -0.16459234451
## 144   0.09545538026   0.04137724489  -0.19342523584  -0.09367479611
## 145   0.08434920794   0.03656302896  -0.17092033360  -0.08277579361
## 146   0.13846823838   0.06002211916  -0.28058399215  -0.13588531063
## 147   0.18602948467   0.08063859284  -0.37695933795  -0.18255936962
## 148   0.22149426492   0.09601158589  -0.44882310785  -0.21736260491
## 149   0.13692526829   0.05935328466  -0.27745740721  -0.13437112245
## 150   0.28094192176   0.12178048701  -0.56928438530  -0.27570135039
##
##
## $result.matrix
##                                             1
## error                      2.423709463439
## reached.threshold          0.009865527973
## steps                   4211.000000000000
## Intercept.to.1layhid1     -1.275340693640
## Sepal.Width.to.1layhid1   -0.718168468842
## Sepal.Length.to.1layhid1  -0.311305999973
## Petal.Width.to.1layhid1    1.455254853968
## Petal.Length.to.1layhid1   0.704772059036
## Intercept.to.1layhid2      2.611397162150
## Sepal.Width.to.1layhid2    2.805382732540
## Sepal.Length.to.1layhid2   5.050907467337
## Petal.Width.to.1layhid2    3.014371874915
## Petal.Length.to.1layhid2   3.519245236428
## Intercept.to.Species.Class    0.358194180130
## 1layhid.1.to.Species.Class    2.464153292759
## 1layhid.2.to.Species.Class   -0.401557080414
##
## attr(,"class")
```

```
## [1] "nn"
```
```
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```