

PCAKernel

You ZUO

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```
library(kernlab)
library(FactoMineR)
library(tidyverse)

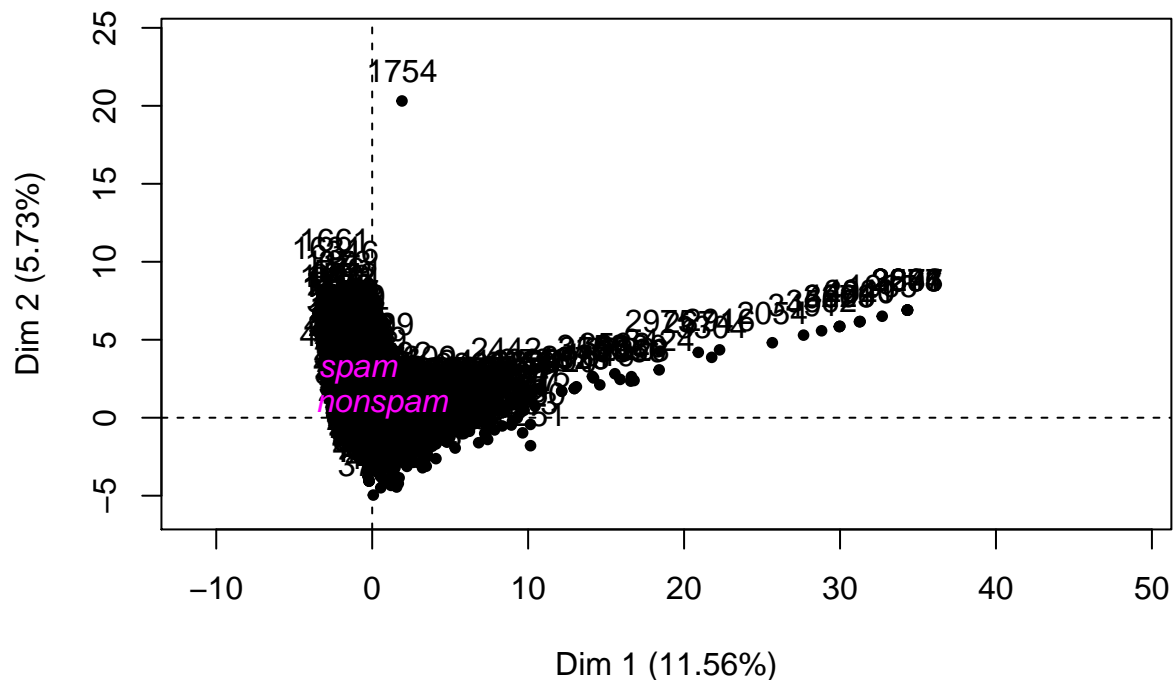
## -- Attaching packages ----- tidyverse 1.2.1 --

## v ggplot2 3.2.0    v purrr  0.3.2
## v tibble  2.1.3    v dplyr  0.8.3
## v tidyr   0.8.3    v stringr 1.4.0
## v readr   1.3.1    v forcats 0.3.0

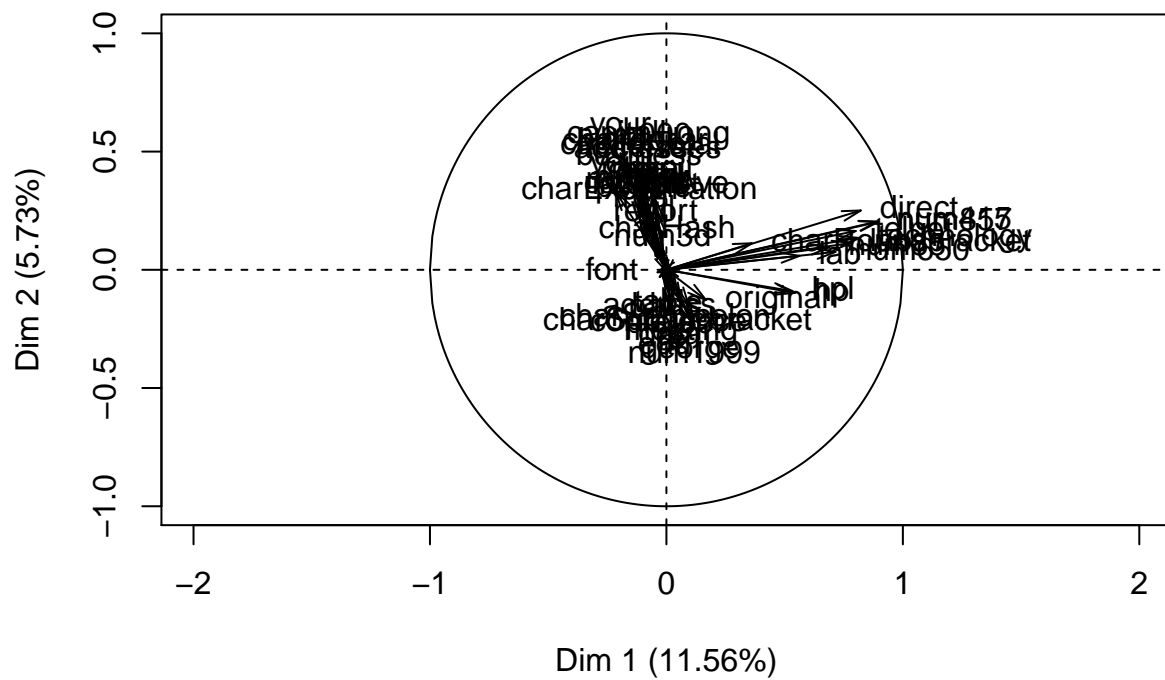
## -- Conflicts ----- tidyverse_conflicts() --
## x ggplot2::alpha() masks kernlab::alpha()
## x purrr::cross()   masks kernlab::cross()
## x dplyr::filter()  masks stats::filter()
## x dplyr::lag()     masks stats::lag()

data(spam)
spam %>% PCA(.,quali.sup = 58) %>% plot(habillage = ncol(spam), choix = "ind")
```

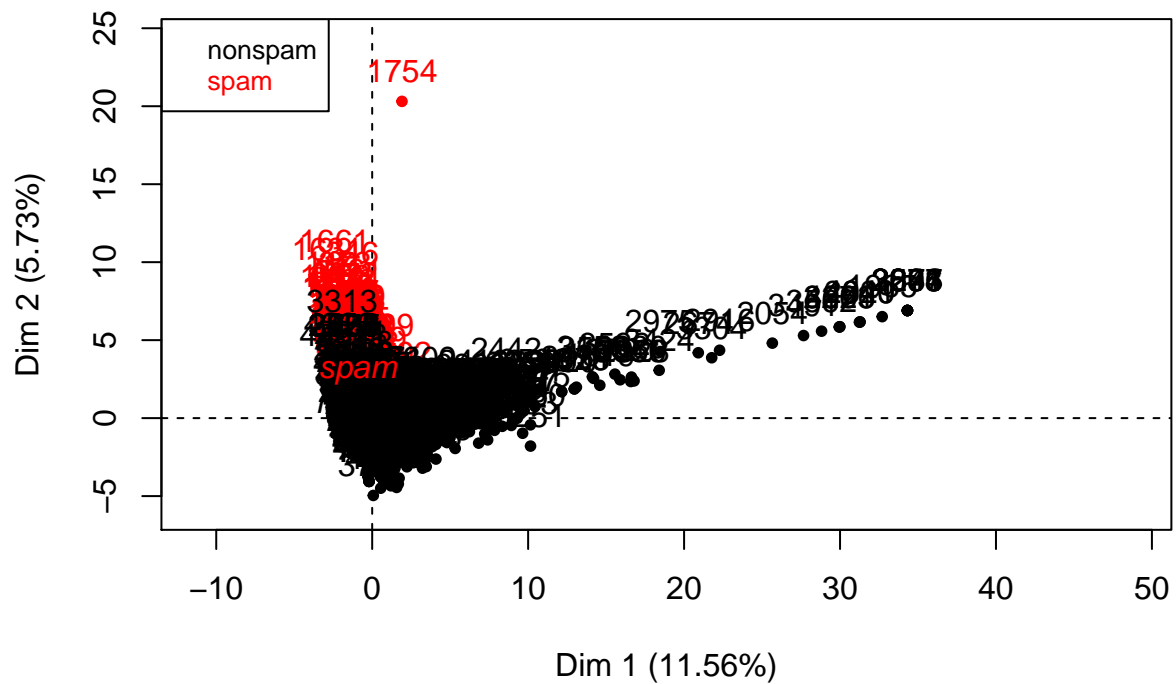
Individuals factor map (PCA)



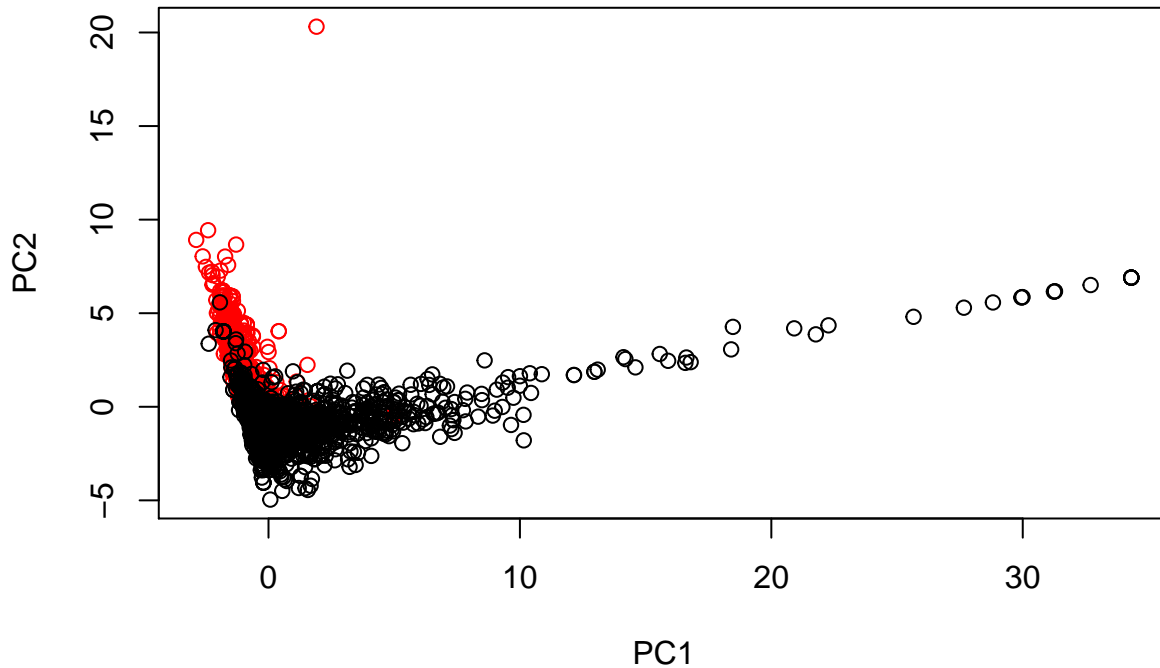
Variables factor map (PCA)



Individuals factor map (PCA)



```
res <- prcomp(spam[, -58], scale. = TRUE)
plot(res$x[, 1:2], col = as.numeric(spam$type))
```



```
set.seed(1)
train <- sample(1:nrow(spam), 400)

X <- spam[train, -58] # training data

res.kpca <- kpca(~., data = X, kernel = "vanilladot", kpar = list(), features = 57)
```

```
## Warning in .local(x, ...): eigenvalues of the kernel matrix are below
## threshold!
```

```
plot(rotated(res.kpca)[,1:2], col = as.integer(spam[train,58]))
eig(res.kpca)
```

```
##      Comp.1      Comp.2      Comp.3      Comp.4      Comp.5
## 3.682865e+05 1.711765e+04 6.796435e+02 1.477618e+01 3.618538e+00
##      Comp.6      Comp.7      Comp.8      Comp.9      Comp.10
## 2.373464e+00 1.581958e+00 1.342548e+00 1.111868e+00 1.062119e+00
##      Comp.11      Comp.12      Comp.13      Comp.14      Comp.15
## 9.137147e-01 7.970608e-01 7.001690e-01 5.211570e-01 4.879145e-01
##      Comp.16      Comp.17      Comp.18      Comp.19      Comp.20
## 4.280942e-01 3.776752e-01 3.615751e-01 3.389373e-01 2.746392e-01
##      Comp.21      Comp.22      Comp.23      Comp.24      Comp.25
## 2.720170e-01 2.471677e-01 2.284653e-01 2.157311e-01 2.098870e-01
##      Comp.26      Comp.27      Comp.28      Comp.29      Comp.30
## 1.997139e-01 1.887577e-01 1.848513e-01 1.660181e-01 1.582436e-01
##      Comp.31      Comp.32      Comp.33      Comp.34      Comp.35
## 1.369543e-01 1.232973e-01 1.001537e-01 9.020154e-02 7.193305e-02
##      Comp.36      Comp.37      Comp.38      Comp.39      Comp.40
## 5.483673e-02 5.375656e-02 5.164525e-02 4.014884e-02 3.840613e-02
##      Comp.41      Comp.42      Comp.43      Comp.44      Comp.45
## 3.336797e-02 2.903226e-02 2.768957e-02 2.431508e-02 2.290574e-02
##      Comp.46      Comp.47      Comp.48      Comp.49      Comp.50
## 2.132525e-02 1.991207e-02 1.845944e-02 1.669139e-02 1.024465e-02
```

```
##      Comp.51      Comp.52      Comp.53      Comp.54      Comp.55
## 6.093146e-03 5.110032e-03 3.874884e-03 3.019725e-03 4.590099e-04
##      Comp.56      Comp.57
## 1.117027e-04 3.063945e-10
```

```
pcv(res.kpca)
```

```
##      [,1]      [,2]      [,3]      [,4]
## [1,] -2.246095e-05 8.600552e-05 -6.122118e-04 3.622738e-03
## [2,] -1.637840e-05 -8.937918e-05 2.146979e-04 3.452460e-03
## [3,] 1.445667e-05 -6.666110e-05 3.747231e-05 4.490250e-04
## [4,] -2.830845e-05 -4.530662e-05 6.867395e-06 3.970866e-03
## [5,] 2.623250e-05 -4.483070e-06 -1.724842e-05 2.511909e-03
## [6,] -3.694116e-05 -5.100262e-05 1.481278e-04 5.810078e-03
## [7,] -3.918860e-05 -6.381449e-05 1.445390e-04 5.811871e-03
## [8,] -3.659459e-05 -6.387728e-05 1.434024e-04 3.921564e-03
## [9,] -3.365855e-05 -5.004352e-05 1.025597e-04 3.889323e-03
## [10,] 2.854233e-05 -3.515449e-05 -1.735115e-04 3.738956e-03
## [11,] 4.350141e-06 -1.214080e-04 3.660649e-04 2.546427e-03
## [12,] 1.574946e-04 3.561437e-03 1.306518e-02 -3.143310e-03
## [13,] 1.254523e-04 -2.866701e-04 7.058486e-04 -7.512194e-04
## [14,] -4.107854e-05 -5.948049e-05 1.312317e-04 5.993411e-03
## [15,] -3.526328e-05 -4.299821e-05 1.437004e-04 -4.147782e-03
## [16,] -3.972841e-05 -6.259284e-05 1.438907e-04 3.211551e-03
## [17,] -4.148342e-05 -5.859680e-05 1.327488e-04 3.244931e-03
## [18,] -4.092876e-05 -5.683406e-05 1.390446e-04 3.222893e-03
## [19,] -7.012078e-06 3.354984e-04 -1.650199e-03 3.155907e-03
## [20,] -3.742278e-05 -3.772388e-05 1.764922e-04 -1.199031e-02
## [21,] -1.966633e-06 -4.754530e-05 -1.018418e-04 4.113795e-03
## [22,] -8.415964e-06 -2.620548e-05 -6.648762e-05 4.595009e-03
## [23,] -2.938140e-05 -6.839873e-05 1.774151e-04 3.827104e-03
## [24,] -3.005333e-05 -1.168648e-05 -5.077111e-05 4.787537e-03
## [25,] 1.502732e-05 -1.437874e-04 3.059353e-04 2.523845e-03
## [26,] 6.120727e-05 -1.370349e-04 3.341177e-04 3.898034e-03
## [27,] -3.256511e-05 -4.996632e-05 5.433141e-05 6.393963e-03
## [28,] -3.902425e-05 -5.815515e-05 1.491218e-04 5.181991e-03
## [29,] -3.548461e-05 -6.006992e-05 1.918348e-04 3.513120e-03
## [30,] -3.286609e-05 -2.757932e-05 1.398607e-04 3.105156e-03
## [31,] -4.010456e-05 -5.583532e-05 1.252273e-04 4.834993e-03
## [32,] 8.401336e-06 -7.625153e-05 7.377798e-05 2.656806e-03
## [33,] -4.094342e-05 -5.982620e-05 1.361886e-04 3.227243e-03
## [34,] 3.570940e-05 9.874018e-04 2.025085e-03 2.251773e-03
## [35,] -3.590468e-05 -6.233451e-05 1.619842e-04 3.412671e-03
## [36,] -2.680231e-05 -7.151060e-05 1.660515e-04 3.116821e-03
## [37,] -4.094551e-05 -5.989221e-05 1.401801e-04 -6.370482e-02
## [38,] 1.582235e-04 9.072597e-04 -5.695020e-03 -1.649642e-03
## [39,] -9.941369e-06 7.736684e-05 -6.659828e-04 2.906789e-03
## [40,] -3.616091e-05 -5.909088e-05 1.209517e-04 3.229223e-03
## [41,] -2.948834e-05 -6.266313e-05 1.163670e-04 3.322583e-03
## [42,] -4.025428e-05 -5.838755e-05 1.443203e-04 -1.351952e-02
## [43,] -3.224553e-05 -6.785226e-05 1.639013e-04 3.271072e-03
## [44,] -1.233781e-05 -4.551970e-05 1.249465e-04 8.687306e-04
## [45,] -3.972846e-05 -6.258758e-05 1.427853e-04 4.155883e-03
## [46,] -4.094551e-05 -5.989221e-05 1.401801e-04 -6.370482e-02
## [47,] -3.240161e-05 -1.619229e-05 1.945674e-04 3.152134e-03
```

```

## [48,] -3.230884e-05 -5.324130e-05 9.753692e-05 3.868883e-03
## [49,] -3.799308e-05 -4.317136e-05 7.802499e-05 3.136791e-03
## [50,] -3.996999e-05 -5.602339e-05 1.496635e-04 -2.493135e-02
## [51,] -4.104855e-05 -5.323944e-05 1.773638e-04 3.510365e-03
## [52,] -2.583846e-05 -1.499839e-05 1.361133e-05 -1.258823e-03
## [53,] -3.552057e-05 -4.027181e-05 3.604739e-05 1.273237e-03
## [54,] -3.553371e-05 -4.265330e-05 1.015973e-04 5.228514e-03
## [55,] -1.194623e-05 -4.893096e-05 1.843277e-04 2.786266e-03
## [56,] -3.065796e-05 -5.027760e-05 1.892332e-04 5.045816e-03
## [57,] 1.034655e-04 -2.605253e-04 5.733734e-04 2.762078e-03
## [58,] -4.034681e-05 -4.926250e-05 1.399629e-04 -5.255444e-02
## [59,] 1.382875e-04 -3.686423e-04 9.406925e-04 4.836399e-04
## [60,] 2.289264e-04 -4.289431e-04 6.771572e-04 -6.859205e-04
## [61,] -2.460429e-05 -4.142959e-05 6.830428e-05 2.988547e-03
## [62,] -3.091203e-05 -4.614923e-05 2.558421e-04 4.016716e-03
## [63,] -3.004260e-05 -6.424108e-05 1.310757e-04 3.836731e-03
## [64,] -2.222056e-05 2.546354e-05 -2.445154e-04 3.420153e-03
## [65,] 1.019785e-06 -5.059464e-05 7.794811e-06 3.178021e-03
## [66,] -3.024058e-05 -4.917639e-05 7.994754e-05 4.869812e-03
## [67,] 1.783144e-04 -3.112816e-04 2.876266e-04 -3.750835e-04
## [68,] -4.009004e-05 -5.280987e-05 1.373128e-04 3.966772e-03
## [69,] -3.656552e-05 -5.795333e-05 1.397489e-04 5.398468e-03
## [70,] -4.107852e-05 -5.951993e-05 1.354313e-04 3.488837e-03
## [71,] -1.918563e-05 -7.758499e-05 1.227524e-04 4.148531e-03
## [72,] -7.504382e-06 -7.503569e-06 -8.814372e-05 5.918664e-04
## [73,] 7.116781e-06 7.249528e-04 1.809348e-03 3.300319e-03
## [74,] -2.685908e-05 5.354810e-05 -3.312426e-04 3.129484e-03
## [75,] -4.094475e-05 -5.987887e-05 1.400758e-04 -3.451879e-02
## [76,] -3.646534e-05 -3.783791e-05 6.373094e-05 -1.004152e-02
## [77,] -3.362468e-05 -7.064499e-05 1.625534e-04 1.296467e-03
## [78,] 5.888002e-05 4.596463e-04 -2.545587e-03 5.363252e-04
## [79,] -2.411667e-05 -8.053706e-05 1.941566e-04 3.021901e-03
## [80,] -1.347479e-05 8.192087e-05 -3.907233e-04 3.559926e-03
## [81,] -4.108104e-05 -5.960132e-05 1.403224e-04 -8.043595e-02
## [82,] -2.252599e-05 -7.782104e-06 4.062273e-06 -4.136227e-04
## [83,] -9.808507e-06 1.047082e-04 -5.942844e-04 3.922326e-03
## [84,] 1.189820e-04 8.188680e-04 -4.230268e-03 3.755050e-04
## [85,] -3.961209e-05 -3.905050e-05 1.176792e-04 3.878652e-03
## [86,] -6.897608e-06 8.574677e-05 -6.147123e-04 3.412738e-03
## [87,] 3.755253e-04 -9.007945e-04 2.329443e-03 -2.897545e-03
## [88,] -3.358162e-05 -6.208536e-05 1.197846e-04 4.245016e-03
## [89,] -3.434618e-05 -5.066409e-05 1.942664e-04 4.217902e-03
## [90,] -1.894257e-07 6.873261e-04 2.808242e-03 3.021303e-03
## [91,] 2.322219e-05 -1.160333e-04 1.625156e-04 3.051516e-03
## [92,] 1.341459e-05 2.455052e-05 -4.762503e-04 3.258885e-03
## [93,] -2.932291e-05 -5.649586e-05 1.814468e-04 3.470741e-03
## [94,] -3.570269e-05 -2.180747e-05 4.005191e-05 3.090186e-03
## [95,] 1.214738e-05 4.015396e-04 -1.339568e-03 -9.703518e-05
## [96,] -4.094551e-05 -5.989221e-05 1.401801e-04 -6.370482e-02
## [97,] -4.080853e-05 -6.012960e-05 1.353352e-04 4.774838e-03
## [98,] -4.134865e-05 -5.889534e-05 1.299147e-04 6.594107e-03
## [99,] -4.094551e-05 -5.989221e-05 1.401801e-04 -6.370482e-02
## [100,] -3.124916e-05 -3.256222e-05 -5.482868e-06 3.701158e-03
## [101,] 2.958774e-05 -1.535487e-04 3.243757e-04 2.197984e-03

```

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## [102,] -1.502907e-05 -9.270064e-05 1.911800e-04 4.988845e-03
## [103,] -8.352306e-06 9.557868e-05 -5.622080e-04 4.052854e-03
## [104,] -3.601630e-05 -2.998082e-05 5.007224e-05 4.337215e-03
## [105,] -3.742281e-05 -3.772533e-05 1.765955e-04 -1.264507e-02
## [106,] -3.372228e-05 -3.560909e-05 1.472455e-05 5.291943e-03
## [107,] 3.527210e-04 3.404178e-03 -1.583211e-02 -1.175951e-02
## [108,] -4.108104e-05 -5.960132e-05 1.403224e-04 -8.043595e-02
## [109,] -1.680291e-05 -6.496450e-05 1.452518e-04 3.118839e-03
## [110,] -3.900943e-05 -5.514149e-05 1.536269e-04 4.128795e-03
## [111,] -3.267928e-05 9.710574e-06 -1.722652e-05 3.477760e-03
## [112,] -2.221237e-05 -8.200111e-05 1.904360e-04 3.137443e-03
## [113,] -1.225624e-05 -8.408892e-05 1.970413e-04 5.157729e-03
## [114,] 7.713930e-05 -2.010885e-04 3.502497e-04 1.291617e-03
## [115,] -7.964560e-06 3.670562e-05 -3.146585e-04 3.998798e-03
## [116,] -1.375747e-05 5.182068e-05 -4.787315e-04 3.520341e-03
## [117,] 5.156750e-05 -1.541097e-04 2.785152e-04 1.625912e-03
## [118,] -3.671534e-05 -6.069621e-05 1.296544e-04 5.500789e-03
## [119,] -3.402031e-05 -4.047085e-05 7.150733e-05 3.493094e-03
## [120,] -3.521537e-05 -6.096054e-05 1.596976e-04 1.392545e-03
## [121,] 2.823727e-07 4.829049e-05 -2.185672e-04 2.373219e-03
## [122,] -3.789176e-05 -2.270811e-05 4.416450e-05 2.535412e-03
## [123,] -3.330267e-05 -3.350304e-05 2.773565e-05 -5.466521e-03
## [124,] -2.604692e-05 -2.975898e-05 -1.779105e-05 3.901364e-03
## [125,] -3.640190e-05 -5.259609e-05 1.091132e-04 4.750426e-03
## [126,] -4.081016e-05 -6.018859e-05 1.403691e-04 -5.252904e-02
## [127,] 2.700354e-05 -1.240837e-04 2.554708e-04 1.966193e-03
## [128,] -2.579075e-05 -3.300810e-05 2.263935e-05 4.324967e-03
## [129,] 3.366376e-06 6.410715e-05 -3.419735e-04 3.624513e-03
## [130,] -2.587634e-05 -4.989275e-05 1.386317e-04 -4.537337e-03
## [131,] -4.107892e-05 -5.953451e-05 1.362830e-04 -1.270071e-02
## [132,] -2.484592e-05 -3.522815e-05 1.999805e-05 4.546441e-03
## [133,] -1.309526e-05 1.843077e-04 -9.636786e-04 3.140041e-03
## [134,] 3.217380e-04 -7.897451e-04 2.058547e-03 -2.102139e-03
## [135,] -3.680703e-05 -5.171767e-05 1.024796e-04 4.606880e-03
## [136,] -4.011905e-05 -5.875875e-05 1.328879e-04 4.399431e-03
## [137,] -3.937182e-05 -4.579796e-05 9.800306e-05 3.344346e-03
## [138,] -3.617515e-05 -6.183413e-05 1.479539e-04 -1.240739e-03
## [139,] -3.830536e-05 -5.074315e-05 1.596865e-04 5.094897e-03
## [140,] -3.072918e-05 -6.434531e-05 2.881658e-04 -9.002137e-04
## [141,] -4.064435e-05 -5.452747e-05 1.371532e-04 3.177232e-03
## [142,] -3.590526e-05 -6.256930e-05 1.340162e-04 3.664759e-03
## [143,] -1.818967e-05 2.585019e-04 -1.049446e-03 2.597799e-03
## [144,] 5.108288e-06 2.764307e-04 -1.032333e-03 3.976755e-03
## [145,] -3.932863e-05 -3.688434e-05 1.033132e-04 -1.702020e-02
## [146,] 4.310198e-05 1.986198e-04 -1.539147e-03 1.268708e-03
## [147,] 1.969527e-05 -1.657920e-04 4.073741e-04 4.461370e-03
## [148,] -2.278094e-05 -8.642859e-05 2.211630e-04 2.932604e-03
## [149,] 1.179353e-04 -1.246024e-04 3.862272e-05 2.356348e-03
## [150,] -3.776566e-05 -5.216154e-05 1.418798e-04 3.506537e-03
## [151,] -3.697077e-05 -5.708946e-05 1.345286e-04 -2.811067e-03
## [152,] -3.913104e-05 -5.228309e-05 1.061648e-04 3.590953e-04
## [153,] -2.252449e-05 2.139791e-05 2.599495e-04 3.424072e-03
## [154,] -2.705003e-07 -1.174411e-04 2.709536e-04 1.203251e-03
## [155,] -3.319016e-05 -6.551070e-05 1.787825e-04 4.357557e-03

```

```

## [156,] 3.894065e-05 8.929009e-04 -4.751072e-03 6.842261e-04
## [157,] -3.441940e-05 -6.559413e-05 1.871274e-04 3.217211e-03
## [158,] -1.207222e-05 8.821671e-05 -6.815210e-04 3.615304e-03
## [159,] -3.316184e-05 -5.998649e-05 1.302692e-04 3.606065e-03
## [160,] 1.350618e-04 3.275177e-03 2.566192e-02 -1.886148e-04
## [161,] -2.223172e-05 -5.842537e-05 1.287025e-04 4.226229e-03
## [162,] -2.185023e-05 -9.141085e-05 2.413774e-04 3.667361e-03
## [163,] -3.341662e-05 -5.614993e-05 1.590085e-04 3.432884e-03
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## [370,] 1.092178e-05 -1.451834e-04 4.298841e-04 3.074100e-03
## [371,] -3.801178e-05 -1.925153e-05 6.652929e-05 2.250325e-03

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## [373,] 3.961498e-05 -1.416679e-04 2.311541e-04 1.801775e-03
## [374,] -3.572605e-05 -5.374479e-05 1.570432e-04 6.006395e-03
## [375,] -2.948445e-05 -7.148784e-06 -6.701450e-05 3.840128e-03
## [376,] -3.776648e-05 -5.248091e-05 1.025215e-04 4.457999e-03
## [377,] -3.079871e-05 -2.389949e-05 7.888377e-05 3.179332e-03
## [378,] -4.094551e-05 -5.989221e-05 1.401801e-04 -6.370482e-02
## [379,] -2.005766e-05 -6.062702e-05 1.146386e-04 3.337593e-03
## [380,] -1.779809e-05 -4.589507e-05 -4.511774e-06 2.715724e-03
## [381,] 7.552164e-04 -1.859694e-03 5.299575e-03 -7.849372e-03
## [382,] -3.777123e-05 -2.592749e-05 4.655971e-05 4.356744e-03
## [383,] -4.034512e-05 -4.919577e-05 1.353003e-04 3.700425e-03
## [384,] -3.791586e-05 -5.503960e-05 1.130654e-04 4.668212e-03
## [385,] -2.606082e-05 -3.241818e-05 1.755030e-05 4.373254e-03
## [386,] 6.337439e-05 8.399350e-04 -3.922301e-03 5.666623e-04
## [387,] -3.406274e-05 -4.878272e-05 1.415051e-04 4.073267e-03
## [388,] 2.307593e-06 -3.857542e-05 9.845891e-06 8.651060e-04
## [389,] 8.167690e-05 -2.494071e-04 5.032614e-04 1.389910e-03
## [390,] -3.211099e-05 -6.830639e-05 1.435745e-04 5.135728e-03
## [391,] -5.859697e-06 -3.257294e-05 2.449725e-04 3.566705e-03
## [392,] 7.505249e-06 -9.145496e-06 -5.448502e-05 5.125911e-03
## [393,] -1.581004e-05 -5.648519e-05 3.573689e-04 3.066847e-03
## [394,] 5.615670e-06 -8.708516e-05 1.551229e-04 3.428488e-03
## [395,] -1.818089e-05 1.227988e-04 -7.646046e-04 4.782008e-03
## [396,] 1.827663e-04 -5.028332e-05 -1.007554e-03 7.081465e-04
## [397,] 2.252482e-05 -1.460757e-04 3.272108e-04 2.219889e-03
## [398,] -3.298836e-05 -2.508674e-05 4.126668e-05 4.427746e-03
## [399,] -3.350763e-05 -4.682297e-05 1.693155e-04 4.514548e-03
## [400,] -1.248470e-05 -7.555534e-05 7.958825e-05 4.247025e-03
##      [,5]      [,6]      [,7]      [,8]
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## [2,] -1.726370e-03 1.267976e-02 2.095248e-02 0.0227873027
## [3,] -4.108523e-02 -3.702510e-02 -1.345971e-02 -0.0076997137
## [4,] 5.598398e-03 7.466813e-03 -8.473381e-03 0.0308457264
## [5,] -5.577273e-03 2.737605e-02 2.677077e-02 0.0310237129
## [6,] 4.284481e-02 -5.109284e-02 -3.525491e-03 0.0354124214
## [7,] 3.945697e-02 -4.569316e-02 -1.860883e-02 0.0795081629
## [8,] -1.802541e-03 1.675669e-02 4.469308e-03 -0.0542327117
## [9,] -1.974196e-02 -1.752223e-02 -9.893473e-03 -0.0741375062
## [10,] 1.911772e-02 -7.026267e-03 -1.682382e-02 -0.0690756660
## [11,] -1.303087e-02 3.216780e-02 2.235878e-02 0.0113918849
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## [14,] 2.253670e-02 4.618159e-02 -2.766114e-01 -0.3962350701
## [15,] -7.536651e-02 -6.300671e-02 -6.596291e-03 -0.0165239364
## [16,] -1.408124e-02 3.390993e-02 2.457046e-02 0.0112994733
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## [20,] -1.361983e-01 -1.568240e-01 -3.880828e-02 -0.0398557005
## [21,] 1.558494e-02 -1.808285e-02 1.135949e-02 0.0089093943
## [22,] 2.761111e-02 -2.600842e-02 -3.147421e-03 -0.0129606998
## [23,] -1.457419e-02 -2.676697e-03 2.143869e-02 -0.0008671664
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## [32,] -1.584072e-02 -1.231829e-02 -7.046813e-03 -0.0140065935
## [33,] -1.409504e-02  3.394753e-02  2.462516e-02  0.0112570933
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## [37,]  1.674471e-02  4.585762e-03  1.987653e-03 -0.0034071062
## [38,]  6.757114e-04  2.526865e-03 -7.577248e-04 -0.0122081165
## [39,] -2.269820e-02  1.746441e-03  1.141300e-02 -0.0108000595
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## [65,] -1.067448e-03  6.864204e-03  1.556520e-02  0.0112315522
## [66,]  1.991943e-02 -1.177829e-02  7.983022e-03 -0.0264585160
## [67,] -1.364636e-02  2.098262e-02  1.050216e-02  0.0111533654
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## [80,]  3.627871e-03  5.595225e-03  2.238198e-02  0.0098601344
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## [90,]  3.327844e-03  2.136303e-02 -2.488230e-02 -0.1458638957
## [91,]  2.541487e-03  1.341385e-02  5.405912e-03 -0.0328025153
## [92,]  1.018777e-02 -3.244147e-03  9.610108e-03  0.0055829950
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## [103,]  1.650032e-02 -5.661232e-03 -1.391089e-02 -0.0419380442
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## [105,] -1.414606e-01 -1.650649e-01 -4.152821e-02 -0.0420991680
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## [172,]  3.971782e-02 -4.846671e-02  7.946333e-03  0.0679163654
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## [175,]  1.139682e-02 -4.151940e-04 -4.410786e-03 -0.0300449835
## [176,] -1.209316e-02  1.113411e-01 -4.822077e-01  0.1786442429
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## [182,]  3.459704e-02 -3.307310e-02 -8.588379e-03 -0.0438187583
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## [184,] -5.805810e-02 -2.753505e-02  6.990484e-03 -0.0017797566
## [185,] -9.597753e-03  4.435986e-02 -7.108129e-02  0.0401773108
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## [188,]  4.139418e-03  5.219244e-03  1.663383e-02  0.0338827900
## [189,]  3.557287e-03  9.148953e-03 -7.418640e-03  0.0435640241
## [190,] -4.890816e-02 -1.640041e-02  1.074089e-02 -0.0002463938
## [191,] -1.483087e-02  5.062623e-02  6.367991e-02  0.0292285786
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## [194,] -4.515488e-03  2.326729e-02 -1.126989e-03  0.0232236761
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## [199,]  1.200077e-02 -8.401704e-04  1.518653e-02 -0.0207269487
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## [203,] -1.409891e-02  3.395324e-02  2.463266e-02  0.0112588611
## [204,]  1.014413e-02  7.254909e-03 -1.484102e-02 -0.0758096014
## [205,]  1.560797e-02 -2.755145e-03 -1.937847e-02 -0.0742186547
## [206,] -7.412098e-03 -2.263574e-03  1.764209e-02  0.0188116001
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## [280,] -4.344380e-02 -1.208559e-02  4.895511e-04 -0.0098314815
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## [374,]  4.243420e-02 -4.919142e-02  4.548758e-03  0.0192679729
## [375,]  2.961260e-03  1.539448e-02 -5.835351e-03 -0.0633234376
## [376,]  1.069964e-02 -4.880964e-03  9.003812e-03 -0.0012088117
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## [379,] -5.820153e-03  2.152579e-02  1.814950e-02  0.0020381096
## [380,] -3.525092e-02  2.203523e-03  1.621027e-02  0.0036266420
## [381,]  8.807458e-03  1.663038e-04 -1.979290e-02  0.0008912944
## [382,]  9.058091e-03  1.070019e-02 -7.357477e-02  0.0758610650
## [383,] -1.483087e-02  5.062623e-02  6.367991e-02  0.0292285786
## [384,]  1.464120e-02 -6.373364e-03  7.181749e-03 -0.0184733290
## [385,]  1.084777e-02  6.745777e-03 -6.402017e-03 -0.0866046927
## [386,] -1.936182e-03  1.461833e-02 -1.850205e-02 -0.0435175164
## [387,] -1.936099e-02 -2.239086e-02  1.962032e-02  0.0042331889
## [388,] -1.814010e-02 -1.441568e-02 -6.399898e-03  0.0096574730
## [389,] -2.108167e-02  1.280294e-02  1.264079e-02  0.0006271785
## [390,]  2.805041e-02 -2.708415e-02 -4.514837e-03  0.0119549310
## [391,]  4.805463e-03  1.093696e-02  2.698984e-02  0.0469423383
## [392,]  4.130973e-02 -4.482997e-02 -1.049766e-02 -0.0317623965
## [393,] -8.204869e-03  2.428752e-02  2.210612e-02  0.0177754007
## [394,] -2.341672e-03 -1.110922e-02  1.209570e-02  0.0095629405
## [395,]  3.157049e-02 -2.940067e-02 -1.384735e-02 -0.0434634812
## [396,]  2.160349e-02 -1.980255e-02 -1.459172e-02 -0.0116142468
## [397,] -2.965530e-02  4.740646e-03  1.096840e-02  0.0018461412
## [398,]  1.288928e-02  1.579628e-03 -8.335265e-03 -0.0605241221
## [399,]  1.425462e-02 -2.157956e-03 -5.926384e-04 -0.0379755659
## [400,]  1.687504e-02 -1.002564e-02 -6.545828e-03  0.0132304186
##      [,9]      [,10]      [,11]      [,12]
## [1,] 0.0096997741 1.629348e-02 0.0007820856 8.662473e-03

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## [2,] 0.0061938613 5.259063e-03 0.0243199436 1.610789e-02
## [3,] -0.0118096593 4.722512e-04 0.0023081983 3.876729e-03
## [4,] 0.0054558094 9.098266e-03 0.0054868906 9.895594e-03
## [5,] 0.0177416417 4.464021e-02 0.0354364299 1.158873e-01
## [6,] 0.0033925796 -9.845762e-04 0.0515972726 8.603191e-03
## [7,] 0.0105308203 -1.219814e-02 -0.0120494441 -2.273773e-03
## [8,] 0.0042716360 5.904719e-03 0.0098867648 3.740245e-03
## [9,] 0.0044298132 -1.185264e-02 0.0394727201 7.752409e-03
## [10,] 0.0029816088 6.178527e-03 -0.0103427133 -1.745559e-03
## [11,] 0.0046959314 2.004714e-02 0.0128966467 1.775494e-02
## [12,] 0.0103482719 9.323899e-03 0.0046263116 -1.113306e-03
## [13,] 0.0170876307 -4.536745e-02 0.0489854744 1.673357e-02
## [14,] -0.0449734017 1.824391e-02 0.0507859893 -4.115512e-02
## [15,] 0.0444518577 -1.560673e-01 0.1509188661 2.234236e-02
## [16,] 0.0036428194 2.407631e-02 0.0156928819 1.815568e-02
## [17,] 0.0047613187 2.194713e-02 0.0184680276 1.870154e-02
## [18,] 0.0036762959 2.405867e-02 0.0157186871 1.823119e-02
## [19,] 0.0103647689 5.656104e-03 -0.0037647854 7.164309e-03
## [20,] 0.0811981012 -2.856755e-01 0.2214944441 1.623792e-02
## [21,] 0.0138841229 -5.236882e-03 -0.0064299419 -3.870947e-02
## [22,] -0.0011326599 8.526639e-03 0.0128154411 -1.867174e-03
## [23,] 0.0194149520 -3.159197e-03 -0.0563133070 2.710082e-03
## [24,] 0.0074865356 4.088070e-03 -0.0035520607 2.746903e-03
## [25,] 0.0044587579 1.769615e-02 0.0094516279 1.466348e-02
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## [27,] -0.0018296043 -3.329373e-03 0.0152307346 -9.889618e-03
## [28,] 0.0066674245 6.208868e-04 -0.0065702515 4.597538e-03
## [29,] 0.0019750745 3.901013e-02 0.0219565481 -1.002341e-01
## [30,] 0.0046926734 1.465125e-02 0.0095917393 1.530952e-02
## [31,] 0.0189239376 -3.232913e-02 -0.0135055002 -5.456366e-03
## [32,] 0.0063068526 9.557716e-04 -0.0243020942 -1.128028e-03
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## [34,] -0.0532032194 -4.769811e-02 -0.0438854443 -1.213993e-02
## [35,] 0.0143432853 -2.599270e-03 -0.0257383483 1.331148e-02
## [36,] 0.0043262682 2.301642e-02 0.0210150752 1.880790e-03
## [37,] -0.0027127648 6.638702e-03 -0.0138691566 -2.403885e-03
## [38,] 0.0133411153 1.653018e-02 0.0069901994 1.341192e-03
## [39,] 0.0144881012 6.837917e-03 -0.0758542450 -2.768414e-03
## [40,] -0.0172095401 4.596994e-03 -0.0035471803 1.091679e-02
## [41,] 0.0164802528 5.027714e-03 -0.0259227815 -4.115096e-03
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## [45,] 0.0166550357 -4.487558e-03 -0.0263204194 4.739422e-03
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## [47,] 0.0047224336 2.340730e-02 0.0138441501 1.822529e-02
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## [53,] 0.0098583890 6.590190e-03 0.0055555924 -1.622113e-01
## [54,] -0.0007260996 6.613656e-03 -0.0073307406 -5.998912e-03
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## [56,] -0.0174628633 -6.328074e-03 -0.0009834608 -4.482454e-03
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## [61,] 0.0146999397 -1.774126e-03 0.0856512703 3.992605e-02
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## [64,] -0.0273654886 6.257329e-03 0.0161219252 1.458977e-02
## [65,] 0.0042196415 1.406273e-02 0.0064722580 9.764215e-03
## [66,] -0.0098812804 -1.588689e-02 -0.0261095321 -5.845585e-03
## [67,] 0.0006095654 7.778430e-03 0.0098427706 8.111345e-04
## [68,] 0.0184879999 -7.556778e-02 -0.0471272909 -2.313260e-02
## [69,] 0.0093539235 -5.334859e-03 -0.0105179954 -2.098501e-03
## [70,] 0.0056533874 -2.995477e-03 -0.0076268030 1.063851e-02
## [71,] 0.0043982721 3.562082e-03 -0.0023727766 5.095201e-03
## [72,] 0.0038192951 -1.842428e-02 0.0280502173 -2.708325e-05
## [73,] 0.0149169387 -1.178252e-02 -0.0387618285 -5.950013e-03
## [74,] 0.0086874501 1.342134e-02 0.0026828280 1.207986e-02
## [75,] -0.0760430422 1.642402e-01 -0.1352613891 -7.892679e-03
## [76,] -0.0048882379 -1.589372e-02 -0.0022460161 -1.332959e-02
## [77,] 0.0096526065 3.000242e-03 0.0010272403 9.243736e-03
## [78,] 0.0043830036 2.247147e-02 0.0270138147 1.719539e-02
## [79,] 0.0086387128 1.201195e-02 0.0082493119 1.535179e-02
## [80,] -0.0057585738 -3.679641e-02 -0.0021239337 8.144030e-03
## [81,] -0.0043052468 2.293033e-03 -0.0212607562 -7.557025e-03
## [82,] 0.0024049025 1.820435e-02 0.0183109241 1.694138e-02
## [83,] 0.0033527428 3.217025e-04 0.0052449922 8.126135e-03
## [84,] -0.1155392686 -6.205288e-02 -0.0189524054 -2.572214e-02
## [85,] 0.0453881503 -3.505928e-02 -0.1196305828 -6.983816e-04
## [86,] -0.0018487965 2.046209e-02 0.0263846235 1.238038e-02
## [87,] -0.0045218696 -1.209329e-03 -0.0004282065 -4.394374e-03
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## [93,] 0.0166092572 -1.063347e-02 -0.0142264689 1.158161e-02
## [94,] 0.0058706594 1.772612e-02 0.0167608778 1.288105e-02
## [95,] 0.0171395563 -1.331896e-02 0.0076925388 2.256155e-04
## [96,] -0.0027127648 6.638702e-03 -0.0138691566 -2.403885e-03
## [97,] 0.0033009686 1.154996e-02 0.0173726378 8.032323e-03
## [98,] 0.0028853931 -3.028707e-03 0.0193329933 -3.863383e-03
## [99,] -0.0027127648 6.638702e-03 -0.0138691566 -2.403885e-03
## [100,] 0.0101753842 2.271877e-02 -0.0339313796 -8.178853e-02
## [101,] 0.0012929333 2.997053e-02 -0.0452837783 6.669327e-03
## [102,] 0.0094476997 -7.012726e-03 -0.0084391581 -1.844999e-03
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## [104,] 0.0080044022 3.354106e-03 0.1020300608 3.035375e-02
## [105,] 0.0845172194 -2.990087e-01 0.2303135278 1.614627e-02
## [106,] 0.0096806073 -7.326407e-03 -0.0070265570 4.744340e-03
## [107,] 0.0344954574 1.716123e-02 0.0249015168 -1.482779e-03
## [108,] -0.0043052468 2.293033e-03 -0.0212607562 -7.557025e-03
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## [110,] -0.0088675453  2.891781e-02  0.0200369070  1.001127e-02
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## [112,]  0.0061483394  1.481799e-02  0.0115094378  1.534193e-02
## [113,] -0.0118474259 -2.472438e-03  0.0049005055 -5.561994e-03
## [114,]  0.0026129095  1.789089e-02  0.0043955440  9.619105e-03
## [115,]  0.0095775095  9.692409e-04 -0.0139362722  4.579087e-03
## [116,] -0.0136343490  3.146104e-03 -0.0057005946  6.063782e-03
## [117,]  0.0002897692  1.348804e-02  0.0006682098  8.741648e-03
## [118,]  0.0164336985 -1.622604e-02 -0.0262275864 -3.754449e-03
## [119,] -0.0030061815  3.178201e-02  0.0047833310  1.159394e-02
## [120,]  0.0224736275 -4.065307e-02 -0.0171323880  5.289857e-04
## [121,]  0.0045568241  2.089841e-02  0.0296592516  1.952696e-02
## [122,] -0.0818536951  1.915128e-01 -0.1404269451  2.434282e-03
## [123,] -0.0063481511  2.457675e-02  0.0176325616  4.772581e-03
## [124,]  0.0162155751 -1.371567e-02 -0.0391010900 -2.187015e-03
## [125,]  0.0080302571  4.234348e-03 -0.0079118480  2.323638e-03
## [126,] -0.0016496023  9.539043e-03 -0.0089324881  1.036251e-03
## [127,]  0.0032632771  1.772353e-02  0.0041526575  1.067711e-02
## [128,]  0.0031228886  8.906071e-03 -0.0067558577  2.935598e-03
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## [130,] -0.0393463271 -6.867722e-03  0.0153018702  1.060416e-02
## [131,]  0.0021486247  1.991559e-02  0.0086716572  1.332923e-02
## [132,]  0.0054696045  3.375512e-03 -0.0164571780 -8.676190e-04
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## [135,]  0.0079649544  1.132447e-02 -0.0099312144 -3.648721e-02
## [136,]  0.0494291747 -6.511275e-02 -0.1093464124 -6.871492e-03
## [137,]  0.0053781570  2.934312e-03 -0.0007678631  1.168706e-02
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## [139,]  0.0072799348  1.717153e-03  0.0487319661  1.609292e-02
## [140,]  0.0156217680 -3.673447e-03  0.0024471315  1.337636e-02
## [141,]  0.0463263463 -6.892004e-02 -0.1066522125 -7.089125e-03
## [142,]  0.0132341556  6.880138e-03 -0.0158621992  1.131428e-02
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## [144,] -0.0045285719 -2.047040e-02 -0.0284109450 -6.655605e-03
## [145,]  0.0869239324 -2.338165e-01  0.4168077140  9.878045e-02
## [146,]  0.0190355760 -6.978445e-03 -0.0051419566  9.329694e-03
## [147,]  0.0091830607 -8.393468e-03 -0.0151111555 -5.965734e-03
## [148,]  0.0083766785  3.680755e-03 -0.0042727162  1.151238e-02
## [149,] -0.0032141789 -7.169065e-03 -0.0018754278 -7.901336e-03
## [150,]  0.0079096206  1.397637e-02 -0.0068479868  9.639762e-03
## [151,]  0.0021934549  1.796992e-02  0.0205295096 -5.255366e-02
## [152,]  0.0405304276 -6.075495e-02 -0.0831862885 -7.738496e-03
## [153,] -0.0471829819 -3.495316e-03  0.0095483670  1.150163e-02
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## [160,]  0.0039811033  7.649942e-05 -0.0021397615 -7.543147e-04
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## [164,] 0.0015286431 2.685137e-02 0.0219397527 1.785982e-02
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## [180,] 0.0068089298 -6.023944e-03 0.0396788080 1.737962e-02
## [181,] -0.0948108100 -5.114160e-02 -0.0203405929 -1.670283e-02
## [182,] -0.0001982357 2.134195e-03 0.0015269717 -4.547877e-03
## [183,] -0.0004996770 8.319420e-03 0.0198228879 -1.626514e-03
## [184,] 0.0349858393 -1.153610e-01 0.1964210508 4.472919e-02
## [185,] 0.0042355770 -7.821032e-04 -0.0064325534 7.982207e-03
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## [187,] 0.0037214280 2.397295e-02 0.0157171062 1.810306e-02
## [188,] 0.0039157899 1.621497e-02 0.0161358078 1.320286e-02
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## [216,] 0.0055586161 2.165650e-04 -0.0028595994 -2.917942e-03
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## [17,] 1.783190e-02 0.0270665547 -0.0213964319 2.233576e-02
## [18,] 1.662873e-02 0.0258716975 -0.0203068905 1.777021e-02
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## [22,] 2.874993e-03 0.0187459260 -0.0126954910 1.959483e-02
## [23,] 2.601965e-02 -0.1456929596 0.1157115727 9.194842e-02
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## [29,] -5.151401e-03 0.0274190477 -0.0004944616 1.938135e-03
## [30,] 1.532854e-02 0.0230598082 -0.0113914034 1.912570e-02
## [31,] -1.167553e-02 0.0960944365 -0.0197246736 5.879503e-02
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## [40,] 8.475411e-03 0.0301634560 -0.0268502442 6.779786e-03
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## [245,] 1.195152e-02 0.0115916168 0.0016150875 3.474547e-02
## [246,] -5.479674e-01 -0.0259323472 0.1088504411 2.483432e-02
## [247,] 3.400522e-03 0.0414556387 0.0185367527 1.471099e-02
## [248,] 9.365573e-03 -0.0668960735 -0.0297184640 -1.871382e-02

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## [386,] 9.488188e-03 -0.0443440980 -0.0023050779 -2.536754e-02
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## [399,] 5.519792e-03 0.0355525881 -0.0514198885 -1.446661e-02
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## [2,] 1.872215e-02 -0.0322114140 6.696797e-02 -2.370199e-02
## [3,] -1.162522e-02 -0.0292377823 1.248510e-01 -1.005748e-01
## [4,] -5.110336e-02 -0.0153447808 -3.003488e-02 -7.301794e-02
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## [6,] -3.005771e-02 0.0638206047 -5.182622e-02 5.532643e-02
## [7,] -2.153755e-02 0.1183026158 1.871785e-02 -1.906941e-02
## [8,] -7.900034e-02 0.0279399603 -4.808788e-02 6.937411e-02
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## [14,] 1.502065e-01 0.5986043191 6.018845e-01 -3.614498e-01
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## [54,] -1.215852e-01 -0.0274570719 -8.247398e-02 -4.172139e-02
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## [56,] -2.155411e-02 -0.0654341844 1.095478e-02 5.588805e-02
## [57,] 6.780397e-02 0.0322465509 -4.205265e-02 -3.380558e-02
## [58,] -3.940234e-03 0.0057265433 9.355316e-04 -3.871101e-03
## [59,] -1.946280e-02 0.0187840442 -5.359690e-03 1.107897e-02
## [60,] -1.916771e-03 0.0025461778 3.151631e-02 3.155018e-02
## [61,] 4.556260e-02 -0.0122604786 -5.295780e-02 2.547650e-02
## [62,] 1.099890e-01 -0.0797234203 2.597160e-01 1.487995e-01
## [63,] 6.510073e-02 0.0328271764 3.563577e-03 3.480485e-02

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## [64,] -1.342256e-02 -0.0344972326 -6.855243e-03 2.423595e-01
## [65,] -2.210105e-02 0.0152254377 4.282932e-03 2.233597e-02
## [66,] 8.222699e-02 -0.0980001596 8.313182e-02 -7.765597e-03
## [67,] -1.030838e-02 0.0372821869 6.360287e-03 8.115192e-03
## [68,] 4.812849e-01 -0.5867144599 -3.335256e-01 -1.219180e-01
## [69,] 3.198580e-02 0.0035195657 -4.094859e-02 -1.664251e-01
## [70,] -4.502540e-02 0.0645975402 6.610161e-03 6.404057e-04
## [71,] 2.916559e-02 -0.0901549289 2.877952e-02 1.284624e-01
## [72,] -8.448367e-03 -0.1015772609 -2.731446e-02 6.800352e-02
## [73,] -1.366361e-01 -0.2462919780 -7.486181e-02 -2.276806e-01
## [74,] -2.373579e-02 0.0020148273 3.571416e-04 -5.026706e-02
## [75,] 5.639025e-02 -0.0574646022 6.591646e-04 1.074093e-02
## [76,] 6.762995e-02 -0.2614559353 -1.133339e-01 4.627043e-01
## [77,] -2.393939e-02 0.0170075201 -2.580502e-02 -4.261333e-02
## [78,] -3.725104e-02 -0.1180269408 -2.633560e-02 2.140800e-01
## [79,] -2.177390e-02 0.0057637698 2.945362e-03 -2.966628e-02
## [80,] 8.517647e-02 -0.0560983777 1.588211e-01 1.126277e-01
## [81,] 8.128357e-03 -0.0068140946 7.738672e-03 -8.371697e-03
## [82,] 9.104574e-03 -0.0055553753 6.250850e-02 3.982207e-02
## [83,] 5.940616e-02 -0.1219602672 2.082104e-01 7.910176e-02
## [84,] 7.667733e-02 -0.0562822665 5.857606e-02 4.847388e-02
## [85,] 5.794469e-02 0.0794777765 -3.555427e-02 -1.266140e-01
## [86,] 3.388807e-01 0.1772034670 -1.178543e-01 5.835775e-02
## [87,] -2.028396e-02 -0.0019303275 -4.782677e-03 9.748041e-03
## [88,] 5.239202e-02 0.0104716136 5.002500e-02 1.382133e-01
## [89,] 3.806121e-02 -0.2377087662 2.416498e-01 -6.360440e-02
## [90,] 2.440310e-01 0.0378194461 1.021334e-01 3.982763e-01
## [91,] -1.985590e-02 -0.0951788641 3.503865e-02 -1.217711e-01
## [92,] -1.445256e-02 0.0271337188 -1.395514e-02 2.049742e-02
## [93,] 3.321594e-02 -0.0028089679 3.385699e-02 -6.502706e-02
## [94,] 6.365604e-02 -0.1023638710 -8.094004e-02 1.160064e-02
## [95,] -1.154872e-02 0.0587218987 -3.178902e-02 -5.263063e-03
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## [98,] -3.508510e-03 0.1218057145 3.568741e-02 -1.013888e-02
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## [102,] -2.875181e-02 0.0753042549 1.758352e-03 -1.808864e-02
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## [114,] -3.202556e-02 0.0105714383 -6.567135e-03 1.003988e-02
## [115,] 5.476732e-02 0.0008060847 2.552814e-02 -9.788407e-02
## [116,] -1.195521e-01 -0.0292078432 -5.049926e-02 3.927116e-02
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## [122,] -4.249094e-03 -0.0331430717 -1.735028e-02 4.136073e-02
## [123,] -9.588472e-02 -0.0038768837 -7.021248e-02 5.975439e-02
## [124,] 4.936692e-02 -0.1820495663 7.451178e-02 -2.536790e-01
## [125,] -2.896783e-02 0.0337585321 -3.279006e-02 -2.796607e-02
## [126,] -3.783353e-03 0.0054317702 7.888450e-04 -3.846224e-03
## [127,] -2.294338e-02 0.0374470614 -3.118282e-03 6.249263e-03
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## [134,] -2.045021e-02 0.0163167852 2.273112e-03 4.342818e-02
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## [140,] -2.529236e-02 0.0358668257 -1.585768e-02 4.313693e-02
## [141,] -7.914551e-02 0.1611689690 4.932664e-02 1.825843e-01
## [142,] -1.863233e-02 -0.0189696722 -1.473570e-02 -9.057677e-02
## [143,] 3.448294e-02 -0.0647551985 1.851783e-02 3.771089e-02
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## [150,] -2.391318e-02 0.0213682239 -3.987321e-02 -4.423005e-03
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## [152,] 1.714812e-02 -0.0104546732 2.918795e-02 -1.265250e-01
## [153,] -3.651854e-02 -0.0014890520 -4.284842e-03 -9.470494e-02
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## [155,] -4.763298e-02 -0.0245733098 1.524923e-02 -1.457495e-01
## [156,] -1.795463e-02 -0.0297593283 6.026138e-02 -6.043557e-02
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## [158,] -2.067385e-02 0.0285367600 -1.527518e-03 -3.650885e-03
## [159,] 1.184863e-01 -0.0203989585 3.880440e-02 1.013670e-02
## [160,] 7.661627e-04 0.0378521730 -5.400950e-02 -3.648922e-02
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## [163,] 8.165079e-02 -0.0067003697 7.497410e-02 2.360086e-02
## [164,] 4.055623e-02 0.1576684687 1.348572e-01 -9.192918e-02
## [165,] 2.209012e-02 -0.0025136451 -1.490825e-02 -7.489021e-03
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## [168,] -1.241390e-01 -0.0611692098 -1.548041e-01 1.657675e-02
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## [172,] -7.576301e-03  0.0870445567  2.171555e-02 -6.512756e-03
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## [178,] -1.649640e-02 -0.0145782458 -1.198478e-02 -7.234027e-02
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## [180,]  2.149193e-03  0.0130663061  5.853759e-02  1.189831e-02
## [181,]  3.573207e-02 -0.1618823729  1.129109e-01 -5.506977e-02
## [182,]  3.624834e-01  0.1192813782 -2.627367e-02  1.727686e-01
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## [195,]  1.056800e-01 -0.0979678654  5.019491e-02 -4.591150e-02
## [196,] -1.736306e-02  0.0451302740  1.555643e-02  1.839954e-02
## [197,]  2.595718e-01  0.1560704560 -3.252481e-01 -7.602015e-02
## [198,]  4.000213e-02 -0.0507012108 -3.184980e-02  5.147700e-02
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## [200,]  2.003886e-02  0.0628049878 -2.851041e-02 -7.486449e-02
## [201,] -9.062549e-03 -0.0565464600  6.686185e-02 -4.880380e-02
## [202,] -1.240129e-01 -0.0611598923 -1.548541e-01  1.668104e-02
## [203,] -2.759579e-02  0.0299339807 -1.309396e-02  5.169584e-03
## [204,]  1.001830e-01  0.0954174551 -1.345379e-01  2.858922e-02
## [205,] -8.001527e-02 -0.0049843397 -5.512038e-02  4.790813e-03
## [206,] -5.141084e-02  0.0127550018 -2.284159e-02 -8.410730e-02
## [207,] -1.760391e-02  0.0660672098  6.928275e-03  1.331555e-02
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## [255,] -3.239248e-03  0.0320703198 -1.393198e-02  8.555113e-03
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## [258,]  3.487634e-02  0.0498024754  6.743758e-02  5.627595e-03
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## [262,] -6.415921e-02 -0.0116083166 -2.683457e-02 -5.476970e-02
## [263,] -4.570130e-02 -0.0296568146 -1.354304e-02 -1.657861e-02
## [264,] -5.561510e-03  0.0611307166  2.426242e-02 -2.946699e-03
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## [267,]  1.524106e-03 -0.0617921882  7.920508e-02  1.536281e-01
## [268,] -5.664553e-03  0.0100788364  3.061761e-02 -9.579936e-02
## [269,] -4.529924e-02 -0.0857974623 -4.902550e-02 -2.057003e-01
## [270,]  2.125827e-02 -0.1424541897  6.558074e-02  4.784626e-02
## [271,] -1.445256e-02  0.0271337188 -1.395514e-02  2.049742e-02
## [272,] -1.521405e-02  0.0012166317  4.538060e-03  2.157415e-01
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## [274,] -1.249601e-01 -0.0691484470 -6.986250e-02 -3.610900e-02
## [275,] -1.835123e-02 -0.0128330202 -4.243577e-03 -7.519833e-02
## [276,] -5.887076e-02 -0.0049449788 -4.390170e-02  7.695618e-03
## [277,] -2.190000e-02  0.0244308897 -4.248504e-02 -5.790352e-02
## [278,] -1.073262e-02 -0.0202435191  8.758979e-03 -1.461870e-02
## [279,] -1.300789e-02  0.0197893079  2.457964e-02  3.674348e-02

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## [280,] 1.115044e-02 0.1250172315 1.111919e-01 -9.292215e-02
## [281,] -2.294136e-02 0.0206006443 -4.606126e-02 2.517412e-02
## [282,] 8.582855e-03 -0.0309233628 -1.759461e-02 2.541730e-02
## [283,] -3.059308e-02 -0.0026323051 -5.910198e-02 3.489598e-02
## [284,] -1.137183e-01 0.0508577641 -4.403271e-02 5.350283e-02
## [285,] -6.149685e-03 0.0563689243 -2.804983e-01 -1.198453e-02
## [286,] -1.763458e-01 0.0997894669 -3.427411e-02 7.465609e-02
## [287,] -3.163994e-02 -0.0012551057 1.204546e-02 6.374552e-03
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## [289,] 4.333782e-01 0.3287622989 -5.118568e-01 -5.300042e-03
## [290,] 9.803174e-02 -0.1618877402 2.116462e-01 -2.886676e-01
## [291,] 2.423291e-01 -0.0599651410 1.971786e-01 1.287212e-01
## [292,] -1.935797e-02 0.0223828083 -1.323022e-02 1.280561e-02
## [293,] -4.656002e-02 0.0285906826 -1.998514e-03 -2.049518e-02
## [294,] -9.137266e-02 0.0700544008 1.098034e-02 -2.606024e-02
## [295,] -4.099140e-02 0.0380799520 -1.585548e-02 1.421770e-02
## [296,] -2.760459e-02 0.0299539204 -1.309386e-02 5.157431e-03
## [297,] -5.122343e-02 -0.0892349474 1.983231e-02 -5.988119e-02
## [298,] -1.635885e-02 0.0489740765 2.159372e-02 -3.195650e-03
## [299,] -8.842411e-03 -0.0011660131 -4.280183e-03 -7.371646e-03
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## [301,] -2.702795e-03 0.0560831469 -1.256781e-02 -2.418446e-02
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## [304,] -3.622361e-04 -0.0140349281 2.076695e-02 7.617845e-03
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## [315,] -2.972939e-02 -0.0039748855 -3.357539e-02 1.622665e-01
## [316,] -1.457505e-03 -0.0275613936 -1.836107e-02 -1.542602e-02
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## [321,] 1.005656e-01 0.0634822432 -3.278517e-02 -1.501342e-01
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## [346,] -8.186729e-02  0.0308709263 -4.877652e-02  4.797728e-02
## [347,] -2.041903e-02  0.0455158246  2.202475e-03 -5.490297e-03
## [348,] -4.616254e-02 -0.0282582238 -2.278420e-02  4.303763e-02
## [349,] -2.653784e-02  0.0282125449 -1.288147e-02  5.270927e-03
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## [354,] -6.997712e-02 -0.0691011246 -1.080590e-01  5.046811e-02
## [355,]  1.981164e-03  0.0415384641 -1.360925e-02 -4.457193e-02
## [356,] -9.847055e-02 -0.2570725501 -9.269073e-03 -4.714435e-01
## [357,]  9.864600e-04  0.0005288739  3.572115e-03 -5.659390e-03
## [358,]  6.766217e-03  0.0237851819  9.979496e-02  8.197179e-02
## [359,]  2.702687e-02 -0.0319773455 -1.249802e-02 -1.698687e-01
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## [362,] -4.172402e-02  0.0421937851 -1.335019e-02 -4.669854e-03
## [363,]  1.078449e-02  0.0349647869 -8.072704e-03 -4.096468e-02
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## [365,] -1.811856e-02  0.0668463321  6.535838e-03 -9.893131e-04
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## [367,]  1.286520e-01 -0.1934855521  1.653005e-01  4.517256e-01
## [368,]  4.954524e-02  0.0896109840  5.424622e-03  2.770298e-01
## [369,]  1.221248e-02  0.0141084397 -2.582715e-02 -6.059850e-02
## [370,] -2.248788e-02  0.0366841595 -1.401299e-02  1.294798e-02
## [371,]  7.369206e-02 -0.0754991345 -5.675472e-03  2.227340e-02
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## [393,] 1.341922e-03 0.0126308808 2.922191e-02 3.137393e-02
## [394,] -1.066313e-02 0.0083157113 -9.197818e-03 -4.849051e-02
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## [400,] -4.233602e-02 0.0327485093 -2.675677e-02 -1.755380e-02
##      [,21]      [,22]      [,23]      [,24]
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## [2,] 6.296244e-02 -0.0234861526 0.0134996206 -0.0124405394
## [3,] 1.827702e-01 0.1500914167 -0.2290177484 0.2231849468
## [4,] -1.226813e-02 0.0948173190 0.0225353631 0.0046505884
## [5,] -1.107455e-01 -0.0152518401 -0.0427145026 0.0710878235
## [6,] 5.147878e-02 -0.0810762868 0.0748160907 0.0058290173
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## [9,] -1.816464e-02 0.1069182420 -0.0798856488 0.0199572843
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## [20,] -1.161194e-01 -0.1972656337 0.3236072370 -0.0699299269
## [21,] 2.746949e-02 -0.0183552470 0.0319912898 0.0236537736
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## [24,] 3.522463e-02 -0.0258575454 0.0869426007 0.0791443217
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## [26,] 1.381551e-02 -0.0273957904 -0.0924368404 -0.1798852694
## [27,] 2.053146e-02 -0.0212704434 -0.0260966891 0.0416375836
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## [30,] 3.670360e-03 -0.0291810851 0.0180640363 0.0001250361
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## [41,] -5.134764e-02 -0.0136569490 -0.0434096006 -0.0152335717
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## [69,] -7.531737e-02 0.1219498691 -0.0887627718 -0.0470906676
## [70,] 2.185774e-03 -0.0080397352 0.0161480876 0.0462298873
## [71,] -2.942517e-01 0.1887875428 -0.0509815194 -0.3200601832
## [72,] -2.997481e-02 0.0756805689 -0.1805812908 -0.0345025984
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## [304,] 4.450501e-02 0.0765657763 -0.1525984253 0.0384772679
## [305,] 6.458887e-02 0.1582927854 0.0103373683 -0.1378410148
## [306,] 1.429106e-01 -0.0324922617 0.0038479911 -0.0480783799
## [307,] 1.056588e-01 0.0844156168 0.0945859404 0.0606203345
## [308,] 1.124344e-03 -0.0133366606 0.0033074192 -0.0028453639
## [309,] -1.067284e-01 -0.0750742815 -0.0793783100 -0.1139989453
## [310,] 1.076085e-01 0.0770965949 0.0886726265 -0.0277685162

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## [311,] -4.003085e-02  0.0111652286  0.0108907187  0.0047649648
## [312,] -3.482841e-02  0.0729379050 -0.0134339838  0.0275491735
## [313,]  1.128965e-03  0.0006231931 -0.0010484698  0.0112767136
## [314,]  6.227485e-02  0.3160266908 -0.1458487098  0.2281056382
## [315,] -9.346401e-02  0.1607463366  0.0505727595 -0.0816974762
## [316,] -1.282991e-02 -0.0444709077 -0.0468543325 -0.0048012865
## [317,]  4.034243e-03  0.0209355085  0.0422922454 -0.0564448854
## [318,]  8.423508e-04 -0.0799610895 -0.0942811182 -0.0262409997
## [319,]  5.354648e-03  0.0124275820  0.1687511977  0.0028948335
## [320,]  2.034750e-03 -0.0453804921  0.0304993038 -0.0258842443
## [321,] -9.207835e-02 -0.0281202900  0.0965565965  0.0423290451
## [322,] -3.337632e-02  0.0341753092  0.1499574769  0.1485398277
## [323,]  3.676342e-01 -0.0468277741 -0.0085720557 -0.1176066417
## [324,]  2.548517e-01  0.0339664531  0.0151893718  0.0316448625
## [325,]  1.128965e-03  0.0006231931 -0.0010484698  0.0112767136
## [326,]  8.162623e-02 -0.1620095400  0.0873100756  0.0552553062
## [327,]  5.164305e-02 -0.0364041948  0.0025302718 -0.0055151274
## [328,]  7.052246e-04 -0.0371648501  0.0105231428 -0.0259592743
## [329,]  1.723818e-01 -0.1247195130 -0.0473156852  0.0529811120
## [330,]  9.701809e-02 -0.0296298622 -0.0821821526  0.0618100140
## [331,] -2.214178e-02 -0.0256147846  0.0312858751 -0.0092265263
## [332,]  7.626456e-02  0.1225645560  0.0299661305  0.0723637976
## [333,]  2.419750e-02 -0.0610050430  0.0355448376  0.0210567559
## [334,] -4.590543e-03  0.0486393734 -0.1364511014  0.0261069100
## [335,] -2.318040e-02  0.1075286522  0.1975590928  0.0784726225
## [336,] -2.548887e-02  0.0292595384 -0.0141015623  0.0498711139
## [337,] -2.759935e-03 -0.0443355564 -0.0211036595 -0.0853899650
## [338,] -9.062644e-02 -0.1245844931 -0.1227809807 -0.0497232838
## [339,] -2.694928e-02 -0.0343922705  0.0971537917 -0.0345433604
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## [341,]  3.883656e-02  0.0127986749  0.1584461762  0.0661767083
## [342,] -4.980368e-01 -0.2280539663  0.1393523457  1.1342975027
## [343,]  3.541901e-02  0.0322199504 -0.0083826219 -0.0423626770
## [344,]  7.154031e-04  0.0200719177  0.0315957330  0.0657441838
## [345,]  3.304532e-02 -0.1088041060  0.0536485392 -0.1388276171
## [346,]  4.332692e-02 -0.0904341395 -0.0342146596  0.0033533151
## [347,]  2.354346e-03 -0.0181299378  0.0202601716  0.0293284776
## [348,] -8.579087e-02  0.0775342187 -0.0332287465 -0.0851220458
## [349,]  2.248377e-04 -0.0314417324  0.0139037843 -0.0228991294
## [350,]  1.812509e-02  0.0202438837 -0.0452262594  0.0607034666
## [351,]  1.407575e-01 -0.0003054392 -0.0327774870  0.0144553218
## [352,] -1.141597e-01  0.0031544098 -0.0167565771  0.0681349458
## [353,] -3.909559e-02 -0.0307158030 -0.0746926615 -0.0969356191
## [354,] -9.237681e-02  0.0961499740 -0.0699141819 -0.1433296217
## [355,] -1.097234e-02 -0.0241136135  0.0456017885  0.0273308354
## [356,]  6.463877e-02  0.2985122595  0.4809082375  0.3188387973
## [357,]  1.128965e-03  0.0006231931 -0.0010484698  0.0112767136
## [358,] -9.406383e-02  0.2256963545  0.1219236256 -0.1513487394
## [359,] -1.097425e-01 -0.0658863728 -0.1483346084  0.0192637970
## [360,]  2.936137e-02 -0.0824951854  0.0056999880 -0.0193163651
## [361,]  2.781335e-02  0.0047151611  0.0491048137 -0.0118018419
## [362,]  1.615380e-03 -0.0614977658  0.0456231721 -0.0331822756
## [363,] -4.222609e-02 -0.0334717481  0.0391383223 -0.0249806918
## [364,] -7.056084e-02 -0.0437473343  0.1073785876  0.1988984400

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## [365,] -2.968056e-04 -0.0175233460 0.0078086515 -0.0106964489
## [366,] -5.187696e-02 -0.0238457901 0.0201213704 -0.0545017316
## [367,] -2.626944e-01 0.3273603905 0.0771307231 0.1767698374
## [368,] 6.791321e-02 -0.0037042187 0.3473407329 -0.0970755897
## [369,] -2.863746e-02 -0.0434608719 -0.0198893455 0.0208078340
## [370,] -1.133139e-03 -0.0433913137 0.0167001716 -0.0093896295
## [371,] -3.588865e-02 -0.0333762215 0.1248860272 -0.0378804504
## [372,] 2.081549e-02 0.1602036459 -0.0732866214 0.0529790176
## [373,] 3.354300e-02 0.0180904515 -0.0660106582 0.0252470722
## [374,] -5.312694e-02 -0.2837710405 -0.0390800072 -0.1160398008
## [375,] 6.719840e-02 -0.1049656072 -0.0470455312 -0.0018617914
## [376,] -3.549444e-02 -0.0241042470 0.0549821540 -0.0303424262
## [377,] -1.591771e-01 0.0190542306 0.0326065148 -0.1469414101
## [378,] 1.128965e-03 0.0006231931 -0.0010484698 0.0112767136
## [379,] -4.315333e-03 0.0204903889 0.0885263541 0.0333222035
## [380,] -8.992969e-03 0.0369191408 -0.2029847343 0.0690824224
## [381,] -4.338079e-02 -0.0265045788 0.0381780462 0.0501125655
## [382,] 1.428036e-02 -0.0880854927 0.0199531007 -0.0067459460
## [383,] -6.392584e-02 0.0155108348 0.0393506855 0.0161859332
## [384,] 1.122580e-01 -0.0987276997 0.0619260092 0.0093770829
## [385,] -6.592019e-02 -0.1233814896 -0.0654723626 0.0677871375
## [386,] 7.881406e-02 0.0718313775 0.0031161536 -0.0513707884
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## [388,] 8.869714e-02 0.0125923178 -0.1100036160 -0.0749204224
## [389,] -6.940809e-02 -0.0678340270 0.0218121469 -0.0704044130
## [390,] 1.368716e-02 -0.0464468889 0.0080299001 0.0258524357
## [391,] 1.466632e-02 0.0023432828 0.0258742203 -0.0038757874
## [392,] 3.351896e-02 -0.0971116722 0.0131500218 -0.0451361473
## [393,] 5.804471e-02 -0.0450145661 0.0349025491 -0.0301021707
## [394,] -4.001800e-04 0.0333280421 -0.0009777122 0.0109461968
## [395,] 1.222271e-03 0.0307936156 0.0161313241 -0.0296475670
## [396,] -3.418512e-02 0.0888665028 0.0854891052 -0.0301695639
## [397,] -5.863988e-02 -0.0667026565 0.0171099059 -0.0764899207
## [398,] -7.813314e-02 -0.0828251297 -0.0456760496 0.0334889278
## [399,] 7.841774e-02 -0.0308051804 0.1640764768 0.1674654494
## [400,] 1.325923e-02 -0.0003504670 0.0094107830 0.0221247536
##      [,25]      [,26]      [,27]      [,28]
## [1,] 0.1746466049 -0.0611696753 0.1342044781 -4.640480e-02
## [2,] 0.0775253198 -0.0348002708 0.0343893009 -6.759806e-02
## [3,] -0.3353688051 0.0729974935 0.1482483979 -3.616897e-01
## [4,] 0.0196983457 -0.0278714001 0.0716869918 1.520729e-01
## [5,] -0.0502613350 0.0704432603 0.0626383195 -8.629149e-02
## [6,] -0.1073096279 0.0214104335 0.0678233157 -1.469661e-01
## [7,] 0.0097383051 0.0057361204 -0.0366978238 -1.736360e-02
## [8,] -0.0530995580 -0.0378926098 -0.0107358560 3.596963e-02
## [9,] 0.0163915254 -0.0091509746 0.0419758616 8.183357e-02
## [10,] -0.1434185398 0.0324559504 -0.0325243379 6.745816e-02
## [11,] 0.0486197370 -0.0340928641 -0.0279139351 2.556660e-03
## [12,] 0.0312444563 -0.0157801794 0.0416453931 1.304792e-02
## [13,] 0.0803066474 -0.0180227280 -0.2482518418 2.707664e-01
## [14,] 0.0556709278 0.1545701897 -0.2649069742 -1.098009e-01
## [15,] 0.1595024455 -0.0462466215 0.0836595767 -1.091353e-01
## [16,] 0.0365504204 -0.0366251347 -0.0360171222 2.056520e-02
## [17,] 0.0311184649 -0.0406492631 -0.0489977068 1.575212e-02

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## [18,] 0.0377335567 -0.0374622249 -0.0349711480 2.377917e-02
## [19,] 0.0508194768 0.0352873880 -0.1714880054 -2.021765e-02
## [20,] -0.0246892034 0.0362604183 0.1427659293 -1.552989e-01
## [21,] 0.0099099631 0.0615175081 0.0156355992 3.174979e-02
## [22,] -0.0247609093 -0.0437048855 0.0165717777 1.057663e-01
## [23,] -0.0809492641 0.0199187811 0.0057221065 -3.162639e-02
## [24,] -0.0366115655 -0.0010853872 -0.0243224513 2.013875e-02
## [25,] 0.0032471248 0.0522696978 0.0339475378 -1.352562e-02
## [26,] -0.2175616068 0.2429393763 -0.5404612105 -3.504452e-01
## [27,] 0.0176706937 -0.0262346561 0.0571386374 7.796215e-02
## [28,] -0.2117815771 0.0199275659 0.0963960288 1.354519e-01
## [29,] 0.0593269760 -0.0520228612 -0.0158918715 2.814424e-02
## [30,] 0.0697028222 -0.0731195555 0.0482365899 7.960169e-02
## [31,] 0.0245342788 -0.0209598412 0.0392688320 2.808101e-01
## [32,] 0.0173516159 0.0382104696 0.0683443160 -3.311465e-02
## [33,] 0.0378031625 -0.0374602205 -0.0349583361 2.374289e-02
## [34,] 0.0081532290 -0.0331598244 0.0106042825 -1.289196e-01
## [35,] 0.1843703793 0.3972053085 0.1179063399 8.285932e-03
## [36,] -0.0069798173 0.0419465227 0.0270084919 6.546369e-02
## [37,] -0.0186170567 -0.0504613794 -0.0105669567 -2.162642e-02
## [38,] 0.1853139040 -0.0063791465 0.0251014014 -1.077713e-01
## [39,] 0.1085660227 -0.0252548501 0.1374186114 -1.399971e-01
## [40,] 0.0475021740 -0.0546585677 0.0674710024 -6.592055e-03
## [41,] 0.0479077339 -0.0346610817 0.0275406519 -3.619980e-02
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## [45,] 0.0412835069 -0.0276704021 -0.0363551220 -8.058313e-03
## [46,] -0.0186170567 -0.0504613794 -0.0105669567 -2.162642e-02
## [47,] -0.1879923980 0.0917624951 -0.0888031889 -3.196765e-01
## [48,] -0.0192466071 0.0193870213 0.0230904661 5.598212e-02
## [49,] 0.0374699970 -0.0372667860 -0.0349065428 2.389918e-02
## [50,] 0.3757840651 1.8343695362 0.3813487377 5.135211e-01
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## [52,] 0.0333803246 -0.0378539626 -0.0332107283 2.116043e-02
## [53,] 0.0422520880 0.0027380342 0.0872963954 -2.895537e-01
## [54,] -0.0723237673 0.0517153949 -0.0845160887 -7.412165e-02
## [55,] -0.0321473855 0.0205064462 -0.0698049780 -1.662981e-01
## [56,] -0.0036593087 -0.0658304474 -0.1060716475 1.254300e-01
## [57,] -0.0176523262 -0.0144279525 -0.0494310954 4.094334e-02
## [58,] -0.0094365311 -0.0482622592 -0.0146641266 -1.392264e-02
## [59,] -0.0323886423 -0.0094779472 0.0234636343 -1.538232e-02
## [60,] 0.0537605546 0.1927808516 0.0885169114 -3.231685e-02
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## [62,] 0.2262493231 -0.1238434066 0.0959002509 -1.503031e-01
## [63,] -0.1765477380 -0.0479473768 0.0717972777 1.671030e-01
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## [66,] 0.0302643793 -0.0140657385 0.1062252674 2.782476e-02
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## [68,] -0.2713436338 0.1770670611 -0.5654683547 -1.251408e-01
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## [70,] 0.1210258981 -0.1146926095 0.1878127380 1.544659e-01
## [71,] -0.1230134243 0.0299137088 0.1165929672 -1.701098e-02

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## [72,] 0.0810175046 -0.0397952420 0.0317948681 1.116660e-01
## [73,] 0.0331819915 0.0979538527 -0.2841913035 -2.841919e-01
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## [75,] 0.0964255051 -0.0184178621 -0.0433264860 8.014393e-02
## [76,] -0.1041148496 0.0719141144 0.2546083144 -2.766210e-01
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## [94,] -0.1002934641 0.0601298195 -0.2592495642 -1.316272e-01
## [95,] -0.0879309363 -0.0342245072 0.0820705099 2.902662e-02
## [96,] -0.0186170567 -0.0504613794 -0.0105669567 -2.162642e-02
## [97,] 0.0308429659 -0.0193973104 -0.0378403308 1.136944e-02
## [98,] 0.0226814465 0.0016931835 -0.0412374794 -3.106391e-03
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## [100,] 0.0507407288 -0.0115080573 -0.0496646599 4.420096e-02
## [101,] -0.0175054914 -0.0258037220 -0.0054236260 5.576659e-02
## [102,] 0.0115654447 -0.0001426237 -0.0473989092 1.102996e-02
## [103,] 0.0119060057 -0.0607681033 0.0729022226 7.159045e-02
## [104,] -0.3665351200 0.0625221126 0.3929081135 -4.358922e-01
## [105,] -0.0271563906 0.0395458126 0.1509099775 -1.628072e-01
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## [108,] -0.0327265927 -0.0537174610 -0.0044743962 -3.297027e-02
## [109,] -0.1364776326 -0.0104966952 0.2280194935 -1.613477e-01
## [110,] -0.0251804662 0.0204728154 0.2895483383 2.067510e-01
## [111,] -0.0672495499 0.0134886667 -0.0125060595 -1.383735e-01
## [112,] 0.0288270959 -0.0363702942 -0.0007153888 -1.664885e-02
## [113,] -0.0020992813 0.0095145061 -0.0380762844 4.726694e-02
## [114,] -0.0398217591 -0.0342041225 0.0674615979 -4.428329e-02
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## [116,] -0.0275257549 0.0625402879 -0.0795185554 -1.063586e-01
## [117,] -0.0166465499 -0.0297901398 0.0130177921 -4.633974e-02
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## [123,] 0.0334791262 -0.0370573239 -0.0440431954 4.402766e-03
## [124,] 0.3472677430 -0.0442724343 0.1476308015 -3.828140e-01
## [125,] 0.0013014234 -0.0279297583 0.0009561058 8.169672e-02

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## [126,] -0.0091903989 -0.0482843939 -0.0146350327 -1.404821e-02
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## [131,] 0.0243706691 -0.0405602883 -0.0291584721 1.294346e-02
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## [359,] 0.0778819088 -0.0199069856 0.1328212019 -2.439880e-01
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## [361,] -0.0213002261 -0.0130890186 0.0641834175 -6.995218e-03
## [362,] 0.0576087796 -0.0601149251 0.0167535978 2.640053e-02
## [363,] 0.0463078797 -0.0240861404 -0.0294894314 3.777434e-03
## [364,] -0.0755082514 0.1217230256 -0.2274350163 -1.094432e-01
## [365,] 0.0316168896 -0.0217486188 -0.0374570642 1.308419e-02
## [366,] 0.0135528126 -0.0268572884 0.1122272838 -5.506883e-02
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## [372,] -0.0564065303 -0.0202211196 0.0953377080 1.364015e-01
## [373,] -0.0667050149 -0.0197152110 0.0286003951 -5.625000e-02
## [374,] -0.4575299765 -0.0935327733 0.1670229291 4.823871e-01
## [375,] 0.0295155816 -0.0246194369 -0.0662153019 -1.104216e-02
## [376,] 0.0092561407 0.0055649702 -0.0585452223 -4.336751e-02
## [377,] -0.1285345776 0.0002720260 -0.0498631171 1.228348e-01
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## [380,] -0.0096572825 -0.0189772005 -0.0025982998 -3.681131e-02
## [381,] 0.0624297712 -0.0025307078 -0.0069751824 3.137690e-02
## [382,] -0.0449189074 0.0604671860 -0.2869906246 -1.052951e-03
## [383,] -0.0324315139 0.0153569219 -0.0713666101 5.554122e-02
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## [387,] 0.0795810703 -0.0087139315 0.0057204621 -4.476916e-02
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## [390,] 0.0242661835 -0.0251865753 0.0101180172 1.455823e-02
## [391,] -0.0615401743 -0.0094134237 -0.0109914995 7.165540e-02
## [392,] -0.2004344248 -0.0371386161 0.0195108215 2.246350e-01
## [393,] 0.0306312915 -0.0391765716 0.0208235247 -3.706507e-02
## [394,] 0.0179178370 -0.0171382541 0.0219032569 4.664052e-02
## [395,] 0.0051150295 0.0093955669 -0.1043121105 3.593427e-02

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## [396,] -0.0483879339  0.0376330085 -0.0940632733  1.908265e-02
## [397,] -0.0632204781 -0.0253042368  0.0088426367  6.030463e-02
## [398,] -0.0505500861 -0.0114707584 -0.0092729129  9.959197e-02
## [399,] -0.0695480715  0.0236552814  0.0061558856  4.461920e-03
## [400,]  0.0250870408 -0.0267105903  0.0198144566  7.349484e-02
##      [,29]      [,30]      [,31]      [,32]
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## [2,]  5.988019e-02 -0.0044754070 -0.0033938418 -0.0956816465
## [3,] -1.075101e-01  0.1798891129  0.2591305491  0.0900473890
## [4,] -2.959970e-02 -0.3182775287 -0.0478536800  0.0751697863
## [5,]  1.725627e-01 -0.0689006730 -0.0117368359 -0.0165146437
## [6,] -7.767055e-02 -0.0039682192 -0.1032524821 -0.1362315694
## [7,]  3.258908e-02  0.0896677344 -0.1093585681  0.0240964774
## [8,]  2.762522e-02  0.0908077839  0.0002580023 -0.0747855214
## [9,]  3.933292e-02 -0.0113366577 -0.0342235925 -0.0525208595
## [10,] 4.255369e-02 -0.0570068195 -0.0400121576 -0.0401330969
## [11,] 1.998389e-02 -0.0097743074 -0.0101328227 -0.0804471846
## [12,] 3.089457e-02 -0.0092710317  0.0038329424 -0.0143293384
## [13,] 1.797874e-01  0.1081965413 -0.0503620686 -0.0143974975
## [14,] 8.672096e-02 -0.0242099095 -0.0372010694  0.0032289636
## [15,] 5.510517e-02 -0.1639121682 -0.0283517488 -0.1057166537
## [16,] 2.667080e-02 -0.0092780498 -0.0071809946 -0.0715813888
## [17,] 2.794908e-02 -0.0138016427 -0.0308278212 -0.0310064258
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## [22,] 8.552872e-02 -0.0017147995 -0.0887666233 -0.0854292917
## [23,] -9.252204e-02 -0.0855294511 -0.0519530311 -0.0328337993
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## [25,] 2.915931e-02 -0.0074397364  0.0012097111  0.1066171630
## [26,] 9.552237e-02 -0.2649265183 -0.0757550356  0.1193829904
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## [28,] 3.639230e-02 -0.1371629540 -0.0850286162 -0.0415009790
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## [34,]  1.156933e-02 -0.4324892404 -0.0453971428  0.0246414373
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## [38,] -5.210006e-02  0.1411219822  0.0487834551  0.0355476182
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## [49,] 2.703939e-02 -0.0063423397 -0.0070814961 -0.0770859061
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## [68,] 6.057281e-02 -0.2980710501 -0.3795160997 -0.0993055078
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## [76,] 1.429895e-01 0.4447934860 0.0440337980 0.1163113042
## [77,] -3.262697e-05 -0.1291162437 -0.0801970952 0.0041221680
## [78,] 5.350880e-03 0.1467736671 -0.0128746539 -0.1874667062
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## [80,] -1.913647e-02 -0.1589485966 -0.0300278570 -0.1958501384
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## [83,] -3.924888e-01 0.0214274086 -0.0406885602 0.1397205979
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## [101,] 8.572551e-03 0.0160044530 0.0286185383 -0.0637738915
## [102,] 3.507005e-02 -0.0056106562 -0.1281976412 -0.0146906929

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## [103,] -1.371264e-01  0.0347280660 -0.0205202279  0.0072361922
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## [111,]  3.523851e-02  0.0769319088  0.0249739654  0.3218315076
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## [122,]  9.263064e-02 -0.0359777847 -0.0122344200 -0.0585512392
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## [130,] -1.130419e-01  0.0686281111  0.0656753487  0.2103014628
## [131,]  1.988734e-02 -0.0080433290 -0.0128231739 -0.0619147046
## [132,] -3.870245e-02  0.1416126717  0.0114940612  0.0231694513
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## [144,] -4.863315e-02 -0.2937208993  0.0612510510  0.0681491263
## [145,]  1.830171e-01  0.0556841064 -0.0032656599  0.1070877612
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## [157,] 1.299930e-02 -0.1206292413 -0.0663491293 0.1933946726
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## [324,]  0.0797975325  0.1632995065  0.0677409049 -2.295030e-01
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## [326,] -0.4482084708 -0.3789735366 -0.1891502699 -1.116651e-01

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##      [,41]      [,42]      [,43]      [,44]
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## [2,] 1.416059e-02 2.884869e-01 -0.3320201068 -0.0307691813
## [3,] -5.003685e-02 -2.798499e-01 0.4734610091 0.0508906241
## [4,] -3.352345e-02 -2.038958e-02 -0.0132972361 -0.0039026152
## [5,] -1.462081e-02 4.568434e-02 0.1970249532 -0.0057654348
## [6,] 1.379168e-01 5.161062e-03 -0.2169083518 0.0248576455
## [7,] 8.685567e-02 -1.569309e-02 0.0102217774 -0.0754493388
## [8,] 3.284954e-02 -1.663345e-03 -0.0286341497 -0.0627418939
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## [11,] 1.072469e-01 -4.023947e-02 -0.0365007980 0.1562448731
## [12,] -5.101088e-02 6.444395e-02 -0.2081329553 -0.1478688854
## [13,] -5.580052e-01 -3.522966e-01 0.7337176806 -0.0961313551
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## [20,] -1.670879e-02 1.554618e-01 -0.0654039827 0.2906707775
## [21,] 1.767977e-01 -1.549920e-01 0.1913440951 0.1568112258
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## [24,] 1.898397e-01 -1.271623e-01 0.1884737200 -0.1271740483
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## [26,] 4.631577e-02 7.971000e-02 0.3660450346 0.3552975137
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## [70,] 5.723607e-02 2.800384e-02 -0.0077092501 0.0601374989
## [71,] 1.575969e-01 -2.871480e-02 -0.3188267553 -0.0693592638
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## [356,] 7.989089e-02 -1.174144e-01 -0.0852350996 0.0737813637
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## [362,] -1.916866e+00 -3.968320e-02 2.2593045550 -0.6781063094
## [363,] -2.277962e-01 -3.607106e-02 0.1292766628 -0.4897687167
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## [365,] 4.939642e-02 -2.331632e-02 -0.0384522136 -0.0647294954
## [366,] 5.130915e-02 4.189521e-02 -0.3120770088 -0.4507347316
## [367,] -2.839540e-01 -1.324867e+00 0.3057683496 1.7440668201
## [368,] -7.267286e-02 1.290771e-01 -0.0764552437 -0.2057235678
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## [370,] 7.329487e-02 -2.085371e-01 -0.0312967249 0.6123445874
## [371,] 6.520402e-03 6.837744e-02 -0.0825745638 0.0063647048
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## [396,] -4.742055e-02 1.956036e-02 -0.0143393507 -0.1387034402
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## [399,] 6.943696e-02 5.726027e-02 0.1859049396 -0.0490680273
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## [336,] -0.334063940 0.098435907 0.4660386585 -0.242356173 1.244087e-01
## [337,] -0.202303983 0.090591405 0.6697450344 -0.782273319 1.570391e-01
## [338,] -0.043465223 0.090331348 -0.1334577384 -0.344950402 -3.641039e-02
## [339,] -0.027161460 0.003925513 0.3342459263 -0.044869928 1.168443e-01
## [340,] 0.008789756 0.182479161 0.0623097472 -0.165527157 -2.993731e-02
## [341,] -0.179903841 0.335189409 -0.5846755381 -0.020704699 4.982495e-02
## [342,] -0.011581550 -0.083403412 -0.1448579544 0.170532583 -3.049141e-01
## [343,] 0.079137687 0.204097632 -0.6810131391 0.201900993 -5.850112e-02
## [344,] -0.248874935 0.546143647 0.0974452957 0.272001833 9.186216e-02
## [345,] -0.002159853 0.151475344 0.8995739319 -0.678977145 -1.234040e-01
## [346,] -0.199278743 0.065539410 0.2107262779 -0.147660020 2.950704e-01
## [347,] -0.296483964 0.018293910 0.0239475642 0.167119618 2.893235e-01
## [348,] -0.231294353 0.149390380 0.1899663635 -0.050033382 4.104650e-01
## [349,] -0.336490611 -0.125164036 0.6515892149 1.224731226 5.736297e-01
## [350,] -2.458288125 -6.931165524 -1.0702041549 -0.285776951 -1.062005e-02
## [351,] -0.014251040 0.013218936 1.0084548491 -0.392990412 1.454352e-01
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## [353,] 0.196318409 0.136200300 -0.3865106457 -0.237800991 -4.921270e-02
## [354,] 0.037229795 0.167764883 0.3532254079 -0.877534473 -1.540469e-01
## [355,] -0.187535210 0.212946641 0.0618445840 0.041201449 1.014271e-01
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## [357,] 0.006046697 -0.018775547 -0.0328563078 -0.031128009 -1.951959e-02
## [358,] 0.424876147 0.102529324 0.2795546556 0.079076222 1.334276e-01
## [359,] 0.053122970 0.333066355 0.3191802121 -0.209515245 -3.779876e-01
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## [361,] -0.228359493 0.042907979 0.1386156592 -0.269402913 2.256589e-02
## [362,] 1.315741242 0.975601542 -1.0018775344 -2.108351178 -6.704179e-01
## [363,] 0.470860120 0.102005469 0.3625741613 0.158497693 1.960270e-01
## [364,] -0.067158962 0.042380314 0.3495405112 -0.691716971 -1.735281e-02
## [365,] -0.198894570 0.053111252 0.2333100439 -0.136175427 2.432941e-01

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## [366,] -0.088255162 -0.134292483 0.7827620556 -0.585672420 -2.416349e-01
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## [369,] 0.532753290 0.362518211 -0.3795929220 0.239335027 -1.913585e-01
## [370,] 0.504279476 -0.043538357 0.3480819670 0.095645622 3.395864e-01
## [371,] 0.063740918 -0.017921605 0.3620477655 0.001315372 6.172163e-02
## [372,] 0.274994862 0.564781592 -3.5010294764 1.791509447 -3.969038e-01
## [373,] 0.562010789 0.007803401 -0.0687030321 0.271706217 4.310266e-01
## [374,] -0.035914366 -0.224668552 0.0798536853 1.929112741 2.053940e-01
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## [376,] 1.100499093 -0.014924667 0.4012041910 0.389586293 2.497811e-01
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## [379,] 0.948229755 0.047450757 0.1858414794 -0.080037255 4.441988e-02
## [380,] 0.346166504 0.174607952 0.5445506734 -0.194804347 5.568816e-03
## [381,] -0.462301942 -0.164428767 0.5965568393 -0.091376680 1.324307e-01
## [382,] -0.213847125 -0.058082421 0.0742067274 -0.237851364 3.218727e-02
## [383,] 0.089742652 -0.040386252 -0.0731705206 -0.011822149 4.787748e-03
## [384,] 0.027341614 0.120911698 -0.0406222152 -0.033835256 7.374008e-02
## [385,] 0.066517654 0.083574154 -0.0416758193 -0.404410892 -2.764000e-02
## [386,] -0.242251678 -0.038363095 1.0360961141 -0.676262150 2.868655e-01
## [387,] -0.694179839 0.439834979 0.4976664191 -0.336590195 -2.885259e-02
## [388,] 0.171950013 0.119172759 -0.4430120504 -0.454942896 -2.930530e-01
## [389,] 0.025857184 0.502676476 -2.3283832656 1.021673371 -4.885251e-02
## [390,] -0.324049645 0.139257725 0.0886161339 0.054494048 1.611810e-01
## [391,] 0.125961637 -0.242905501 0.7750183781 1.457668928 3.988138e-01
## [392,] -0.162544898 0.012686661 0.2881992940 1.047109954 1.606769e-01
## [393,] -0.176921927 0.021980780 0.2389322062 -0.244546826 1.861084e-01
## [394,] -0.266455265 0.179202952 0.3940657653 0.141315689 1.452030e-01
## [395,] -0.161683583 0.203592466 0.1286743700 -0.067926137 1.485859e-01
## [396,] -0.125370322 0.258975173 -0.3473732422 -0.864551811 -2.370609e-01
## [397,] 0.501328158 0.169553806 -0.9604335063 0.727769406 3.554757e-02
## [398,] -0.059316532 0.125512501 -0.1117857906 -0.344301468 -3.307948e-02
## [399,] -0.021288254 -0.064120331 -0.1219732009 -0.067549854 2.867614e-01
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##      [,55]      [,56]      [,57]
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## [2,] 0.1928308983 7.435817e-01 52045.696177
## [3,] -0.1110595363 6.923403e+00 2365.776138
## [4,] -0.0482236264 -1.300155e+00 -2229.057468
## [5,] 0.0695424189 5.994840e-01 1285.305264
## [6,] 0.1454054354 -1.116268e+00 1143.033311
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## [18,] -0.1309487162 -2.995717e-01 3181.493758

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## [19,] -0.0421934494 -1.362163e+00 860.660400
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## [24,] -0.5369572126 1.679713e+00 703.705807
## [25,] 0.1381893333 1.924855e+00 -846.038007
## [26,] 0.2990634594 3.132343e+00 1113.537524
## [27,] -0.0587703587 -9.610522e-01 1933.156353
## [28,] -0.0067752959 -8.259362e-01 469.943529
## [29,] -0.5795532276 -1.300127e+00 -362.902052
## [30,] -0.3177664107 3.903132e-01 501.536223
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## [32,] -0.0667651050 5.066293e-01 -114.227787
## [33,] -0.1317098092 -2.978451e-01 781.024931
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## [44,] -0.8271351722 -8.320818e-02 199.183664
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## [55,] -0.3698356265 1.232235e+00 1025.507640
## [56,] 0.0256293797 -1.566062e+00 173.271984
## [57,] -0.5859404634 1.878560e+00 -1773.238884
## [58,] 0.0206621434 -5.572634e-02 -46.416611
## [59,] -0.4251366094 3.363300e+00 1190.285551
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## [70,] -0.0466024868 8.111899e-02 484.425492
## [71,] -0.8485410888 2.253077e+00 -23.812375
## [72,] -1.5777436105 -9.767789e-01 711.672571

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## [73,] 0.9221157339 3.122335e+00 773.109227
## [74,] -0.1262784911 -2.496386e+00 851.446502
## [75,] 0.1515233163 3.735104e-01 2157.136933
## [76,] 0.3720944898 2.904860e+00 682.094659
## [77,] -0.0040615281 -1.524086e+00 -56.954831
## [78,] -0.6207392745 1.070859e+00 1627.698785
## [79,] -0.0549092443 -1.027446e+00 -246.458919
## [80,] -0.6479011227 -1.656374e+00 -1707.699623
## [81,] 0.0927872687 6.548707e-02 163.762838
## [82,] -0.9867069343 -1.158857e+00 135.226373
## [83,] -0.3071798081 -9.369806e-01 262.903770
## [84,] 0.0912556574 -1.334635e+00 472.167277
## [85,] 0.1942367909 -1.260958e+00 486.214050
## [86,] -1.0778919406 4.327917e+00 484.170410
## [87,] -0.4791543044 5.652282e+00 4431.044872
## [88,] -0.5095409803 3.496230e-01 854.456138
## [89,] -0.0366220849 8.100285e-01 1091.612032
## [90,] 0.3304369405 2.423922e+00 1084.261491
## [91,] -0.7828766971 3.894636e+00 -1214.484903
## [92,] -0.3515092896 2.392197e+00 906.656114
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## [94,] -0.9278531933 -3.964227e+00 -106.637918
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## [96,] 0.0477856070 -5.812587e-03 -190.795886
## [97,] 0.0190089122 -2.516299e-02 323.362068
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## [101,] -0.0258621360 4.884104e-02 -1148.116336
## [102,] 0.0451187961 2.185877e-01 355.369940
## [103,] 0.1257773256 -6.843442e-01 230.713766
## [104,] 0.2535073848 1.524587e+00 -80.098272
## [105,] -0.0751642642 -6.595397e-02 312.698741
## [106,] -0.3109261255 1.703589e+00 -916.514902
## [107,] -0.4728627162 2.311960e+00 2232.116402
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## [109,] -0.0678440722 1.711720e+00 181.020838
## [110,] -0.8952002568 -2.001878e+00 1010.507276
## [111,] 0.2069502030 1.281324e+00 708.320730
## [112,] 0.3992205014 3.588845e-01 -82.391678
## [113,] 0.1215610841 -8.444306e-01 622.399898
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## [115,] 0.2098492514 -9.600600e-01 300.712041
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## [117,] -0.3331107182 2.388107e+00 -653.516367
## [118,] 0.2932488991 2.371082e+00 195.601594
## [119,] -0.2376899548 1.588794e-01 504.867827
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## [121,] -0.3054019227 1.840981e+00 -680.395117
## [122,] 0.0583620378 -9.134724e-03 421.156713
## [123,] -0.2297278422 -1.110108e+00 -42.435842
## [124,] -0.1509392277 1.407273e+00 -163.580337
## [125,] -0.7608258066 -1.827985e+00 1048.936839
## [126,] 0.0176820843 -5.287394e-02 39.083082

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## [127,] -0.5738495174  1.978648e+00  191.336823
## [128,] -0.5523752302  2.406582e+00   15.081792
## [129,]  0.3731738577  3.134411e+00 1073.127322
## [130,]  0.2402594219  4.258532e+00 1325.534925
## [131,] -0.0888621042 -2.300498e-01 -421.529876
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## [156,] -0.0193493528  2.239881e+00 -202.439130
## [157,]  0.3805789281  4.014331e-01  198.383097
## [158,]  0.4561964288  6.707756e-01  61.171462
## [159,]  0.0727914173  2.547598e+00 -475.608902
## [160,] -0.1684171703 -7.675766e-05 -1318.236930
## [161,]  0.2879393762 -7.800375e-01 -13.750583
## [162,] -1.4500914299 -1.682637e+00  692.663770
## [163,] -0.7997314991 -1.383921e-01 1486.631090
## [164,]  0.2300399967  2.843468e-02  159.205391
## [165,]  0.0303051637  2.290615e+00  425.624217
## [166,]  0.5144968681  3.209966e+00 -1681.993713
## [167,] -0.5343108794  1.145471e+00 -1247.420084
## [168,]  0.1884067696 -2.520782e+00  425.545630
## [169,]  0.0412797626 -2.652692e-01 -234.285113
## [170,]  0.0548064206  4.008201e-01  448.454275
## [171,] -0.0359680147 -1.141548e-01 -148.227554
## [172,]  0.1109150711  1.376600e-01 -603.251780
## [173,]  0.2009817400  2.121695e+00 -1155.053657
## [174,] -0.0956265294  2.723092e+00 1413.446855
## [175,] -0.0773884419  2.361240e+00  187.368291
## [176,]  0.0613219288 -2.290033e-01  276.767621
## [177,] -0.0639963865 -7.509716e-02 -446.942429
## [178,] -0.1992383674 -1.846296e-02  242.972329
## [179,]  0.8058246084  7.396976e-01  321.412552
## [180,]  0.9899783216  1.309187e+00 -2287.548908

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## [181,] -0.5152384809 4.208463e-01 -314.661325
## [182,] -0.7159853927 -2.013862e+00 494.638342
## [183,] 0.2257655984 -4.988535e-01 -883.553022
## [184,] -5.0649004591 1.495040e-01 -1148.999035
## [185,] -0.0176500542 2.038083e-01 599.954249
## [186,] -0.0584860807 -3.708112e+01 -163.795399
## [187,] -0.1287894714 -2.796500e-01 -155.071792
## [188,] -0.5735144272 -7.579895e-01 1003.167361
## [189,] 0.2332328103 -5.175414e-01 20.750801
## [190,] -1.3927023898 1.513617e+00 2010.216080
## [191,] 0.1391072172 -4.037919e-01 844.511623
## [192,] -0.3400819497 5.685774e+00 607.788091
## [193,] -0.5082507481 -1.392749e-01 304.450634
## [194,] -0.0769635206 -3.591316e-02 75.648176
## [195,] 0.0860123505 -9.286160e-02 1022.153271
## [196,] 0.0838299783 -2.726167e+00 -414.863736
## [197,] 0.1501828317 1.492279e-01 -15.284894
## [198,] 0.1277564916 3.384748e+00 -1420.295564
## [199,] 0.5712408742 -7.077260e-02 -107.986570
## [200,] 0.0671936466 -9.209769e-01 430.960834
## [201,] -0.4726862420 -7.436176e-01 230.762435
## [202,] 0.1877241452 -2.521055e+00 922.949440
## [203,] -0.1315820183 -2.995532e-01 -126.769164
## [204,] -0.0158739172 -1.723873e+00 -24.754794
## [205,] -0.1444276372 -1.508367e+00 -759.733944
## [206,] -0.2470270191 -1.274314e+00 571.910198
## [207,] 0.2767616223 -8.911108e-01 1462.187938
## [208,] -0.1106098930 -4.267177e-01 -263.399848
## [209,] -1.8528929009 1.334514e+00 -382.460004
## [210,] -0.4412625677 -3.915436e-01 544.986378
## [211,] -0.3406540217 -1.120570e+00 -0.228938
## [212,] 1.3203759298 -1.398078e+00 767.181568
## [213,] -0.4730599136 1.942456e+00 1047.275887
## [214,] -0.0581009713 -1.398308e+00 282.941156
## [215,] 0.0477856098 -5.812635e-03 125.021319
## [216,] 0.1416255063 -1.681822e+00 989.145023
## [217,] -0.0005846532 -2.800342e-01 -1030.898159
## [218,] 0.2099237645 1.963065e-02 -366.074031
## [219,] -0.0326764558 -3.493444e-01 -121.866498
## [220,] 0.3793196888 -4.856024e-01 40.985077
## [221,] 0.2254615248 -4.202321e-01 838.041610
## [222,] 0.3119466948 2.149691e+00 -884.628385
## [223,] -0.0716020546 4.443339e+00 -2260.636915
## [224,] -2.6725683707 -1.198890e+00 2710.263519
## [225,] -0.5090054764 -1.576581e+00 -603.807583
## [226,] 0.0688663759 7.615255e-02 452.482496
## [227,] 0.0414147832 -8.887500e-01 -869.853752
## [228,] -0.2571944452 -2.826705e+00 752.790244
## [229,] -0.1836885530 -4.379075e-01 216.158250
## [230,] -1.1380775162 -1.744331e-01 1425.470091
## [231,] -0.2493499884 2.862917e+00 920.170569
## [232,] -0.1107071791 -1.770881e+00 178.293193
## [233,] -0.2123791815 1.352680e+00 -263.443444
## [234,] -0.3992137467 1.512542e+00 -565.065986

```



```

## [235,] -0.2694684093 -5.152176e-01 278.055890
## [236,] -0.2090224578 2.994427e+00 -1809.086368
## [237,] -0.4752518559 1.706403e+00 -353.933380
## [238,] 0.2541500940 -8.129721e-01 306.540502
## [239,] -0.9658439738 -8.925072e-01 1780.773833
## [240,] -0.1031176831 -5.184112e-01 177.637912
## [241,] -0.1596093362 -3.476640e-01 -694.915226
## [242,] 0.0190671676 -5.714854e-02 65.172201
## [243,] -0.0791888309 -4.512961e-01 -202.360455
## [244,] 0.0676755175 1.232563e+00 467.706205
## [245,] -0.0171564646 8.963176e-01 -455.702131
## [246,] -0.2637004008 -2.431360e-01 212.229576
## [247,] -0.1405042256 9.278495e-02 447.587459
## [248,] -0.6630418444 3.406739e+00 1698.289207
## [249,] 0.2861676107 -6.963799e-02 232.605775
## [250,] -0.3660318074 -1.283543e+00 854.297300
## [251,] -0.7340653073 9.178857e-01 554.641189
## [252,] -0.1922054447 -2.931405e-01 -708.234604
## [253,] 0.8494840369 -1.090313e+00 -3488.367542
## [254,] -0.0266590466 2.703430e-01 -140.474983
## [255,] 0.3007513217 1.143994e+00 576.486077
## [256,] -0.5908213660 3.643292e+00 -1278.699854
## [257,] 0.1180768916 2.294549e-01 248.445704
## [258,] -0.0261571201 -2.315054e-01 -391.825793
## [259,] -0.1776706212 -3.722531e-01 1377.405377
## [260,] 0.2548140210 1.771816e-01 -59.399856
## [261,] -1.6875394114 -1.600704e+00 1401.988214
## [262,] -0.2628879147 1.432796e+00 717.833099
## [263,] -0.1742436404 -1.157053e+00 123.991737
## [264,] 0.0031882291 5.750386e-01 468.062348
## [265,] -0.3839796869 -1.276043e+00 -210.453721
## [266,] -0.2184439318 2.445143e+00 138.845427
## [267,] -0.1092824625 -5.463265e-01 -93.902826
## [268,] 0.2076917396 3.254770e-01 -387.358096
## [269,] -0.2785455340 1.611074e+00 -135.069200
## [270,] 0.2325132275 -5.898103e-01 -1249.445571
## [271,] -0.3515092912 2.392197e+00 751.971706
## [272,] -0.3414055731 1.583621e+00 -88.800408
## [273,] -0.7881516949 2.098512e+00 132.944078
## [274,] -0.3068032459 2.704440e-01 1400.960040
## [275,] -0.3190587449 3.010153e-01 -11.849457
## [276,] -0.2702148723 -1.549217e+00 -1001.023170
## [277,] 0.1396606975 1.113320e+00 914.934735
## [278,] -0.2422921897 -2.955363e-01 -393.902614
## [279,] -0.3741400521 4.245924e-02 -861.340551
## [280,] -2.9646365001 1.045929e+00 2555.021751
## [281,] -0.0894960439 4.944517e-01 -863.980013
## [282,] 0.3496114868 8.770197e-01 -1756.755394
## [283,] -0.1680351496 -7.535720e-01 -3.116483
## [284,] 0.3494418070 2.968869e-01 -61.557514
## [285,] -0.8253771847 -1.404295e+00 608.322415
## [286,] -0.2262407877 -1.161295e+00 159.489602
## [287,] -1.1804689365 9.460833e+00 -4400.918466
## [288,] -0.3006196595 1.829794e-01 -91.300030

```

```

## [289,] -0.2592394897 -5.500141e-01 345.283389
## [290,] -0.1498087824 4.165415e+00 -765.736052
## [291,] -0.2327015997 3.190577e-01 -332.682664
## [292,] -1.6596719623 -1.888313e+00 1135.485388
## [293,] -0.1611034414 -3.206607e-01 -555.470452
## [294,] -0.1548276338 1.356547e+00 932.344381
## [295,] -0.9243566899 1.719939e+00 1460.851036
## [296,] -0.1311986251 -3.046782e-01 -780.760227
## [297,] -0.8150993289 1.511285e+00 -129.598692
## [298,] 0.3627903292 2.809134e-01 233.915008
## [299,] -0.0696247910 1.779061e+00 -4209.861885
## [300,] 1.5371500748 -3.048254e-01 580.438719
## [301,] 0.4019784112 -2.819752e-03 -63.632310
## [302,] -0.5424172000 6.226936e+00 6200.706741
## [303,] -0.4939448763 2.238597e+00 -1048.891290
## [304,] 27.4484642719 -1.095609e+00 252.319690
## [305,] -0.0994003427 2.601558e+00 482.761885
## [306,] -1.2109701168 -1.855356e+00 1042.936697
## [307,] 0.5606006124 1.895191e+00 1662.494471
## [308,] -0.0196529602 -1.136166e-01 309.628923
## [309,] -0.0263338670 1.757483e+00 796.388924
## [310,] 0.0125988335 1.870598e+00 -741.132321
## [311,] -0.0460980734 1.494803e+00 -175.967222
## [312,] 0.0385027309 -1.028169e-01 1284.233518
## [313,] 0.0477856142 -5.812659e-03 703.247065
## [314,] 0.1506617916 -9.546180e-01 1811.989659
## [315,] 0.0355895029 4.701230e-01 -266.969836
## [316,] -0.4857300540 -1.072087e+00 117.134840
## [317,] -0.6414224263 1.609949e-01 412.491932
## [318,] -0.1225700890 -7.325996e-01 175.974638
## [319,] -0.3029531848 -1.532112e+00 -253.769944
## [320,] -0.3883076953 -5.024006e-01 -1372.916722
## [321,] -2.2955504123 3.852285e-01 1672.577442
## [322,] 0.6233045503 9.573005e-01 320.052045
## [323,] -0.7784563423 -2.125984e+00 -2023.531614
## [324,] -0.1429975913 -6.742493e-01 -314.834724
## [325,] 0.0477856134 -5.812649e-03 699.621483
## [326,] 0.0074673797 -1.374313e+00 -648.923872
## [327,] 0.8807208100 -1.429336e+00 260.145493
## [328,] -0.1287894698 -2.796501e-01 -173.300551
## [329,] 0.0431560724 -3.483557e+00 772.399971
## [330,] 0.3497117232 4.801908e-01 562.598472
## [331,] -0.4213467614 -9.204712e-01 10.677633
## [332,] -0.4017019159 2.607713e+00 -1051.830619
## [333,] -0.0152021082 2.169379e+00 1314.488854
## [334,] -0.2699216799 5.312310e-01 281.606817
## [335,] -0.7550728904 -6.065265e+01 2615.026006
## [336,] 0.0260608354 1.914085e+00 -466.398201
## [337,] -0.1775858781 -7.693795e-01 -1850.898130
## [338,] -0.2323967249 5.690242e-02 -902.897086
## [339,] 0.0821438461 3.103692e-01 267.833897
## [340,] -0.2598629375 -3.191573e-01 -461.661894
## [341,] -0.2068306206 1.791750e+00 -841.115818
## [342,] -0.8723160564 -1.568123e+00 314.688344

```

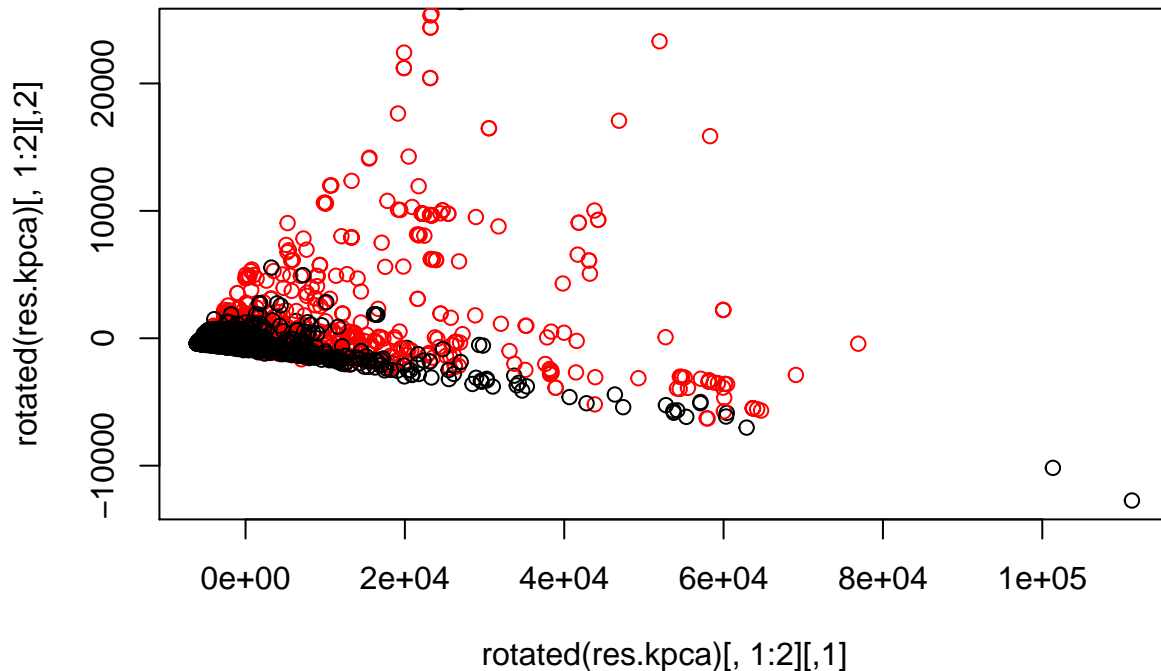
```

## [343,] -0.1351033174 9.087429e-01 144.348929
## [344,] 0.1301662561 -1.716578e+00 916.055635
## [345,] -0.4854857924 -1.142722e+00 1084.022716
## [346,] -0.1489492792 -8.262397e-01 167.607384
## [347,] -0.0700817914 3.411135e-02 210.415020
## [348,] -0.2334700910 8.562765e-01 -777.470194
## [349,] -0.1222690943 2.198215e-01 -504.497617
## [350,] 1.4408771567 -5.030045e-01 -257.000326
## [351,] -0.0064098204 2.580277e-02 -292.311878
## [352,] -0.0900217906 6.037598e-01 -964.973449
## [353,] 0.1171610965 9.484873e-01 1018.801391
## [354,] -0.5583091125 9.279596e-01 46.992835
## [355,] -0.1219408710 -2.724783e-01 -377.901413
## [356,] -1.2501974675 8.585675e+00 -479.877486
## [357,] 0.0477856163 -5.812654e-03 682.152997
## [358,] -0.5768458964 2.345681e+00 -358.504882
## [359,] 0.1898640195 1.394786e-01 635.781399
## [360,] -0.3289947360 -4.925631e-01 -264.032576
## [361,] -0.4504323847 9.902457e-01 -1447.269265
## [362,] -0.0723824114 -2.425919e+00 2575.208538
## [363,] -0.0743190409 1.137926e+00 -13.937493
## [364,] -0.4557861143 1.858022e+00 975.581495
## [365,] 0.0012172246 -5.979601e-02 756.415836
## [366,] 1.9968496513 5.221363e+00 -300.896679
## [367,] -0.0639941237 -5.931732e-01 1240.511399
## [368,] 0.4428761637 3.996239e-01 5.401938
## [369,] 0.7113624217 8.527647e-01 -515.374394
## [370,] -0.4635783019 7.203460e-01 -1012.890430
## [371,] 0.1561058480 4.621328e-01 -420.375740
## [372,] -1.2504736367 -1.151236e+00 1753.279952
## [373,] -0.6346198652 3.159578e+00 -809.330154
## [374,] -0.2605047183 3.133592e-01 -146.716690
## [375,] -0.5611391635 3.121091e-01 171.023815
## [376,] -0.1095521786 1.062601e+00 1846.292315
## [377,] -0.0548291095 2.172041e-01 323.289244
## [378,] 0.0477856165 -5.812729e-03 320.708957
## [379,] 35.5632114040 -6.351893e-03 827.214764
## [380,] 0.3466209535 1.103087e+00 -927.270091
## [381,] -0.9089521349 9.916455e+00 6572.258875
## [382,] 0.4678987761 -2.931098e-01 376.585606
## [383,] 0.1391072172 -4.037919e-01 142.772162
## [384,] -0.3761615525 -1.442726e+00 148.045503
## [385,] -0.6120131038 -1.303735e-01 851.378202
## [386,] 0.2658173012 1.676310e+00 1855.244213
## [387,] -1.8356021392 1.578062e+00 -284.783414
## [388,] -0.1925322851 4.491436e-01 1237.973147
## [389,] -0.0941155853 1.226525e+00 1056.005962
## [390,] 0.3364655660 -3.817701e-01 784.692176
## [391,] -0.0392431647 -7.354145e-02 651.876459
## [392,] -0.2526213841 1.036436e+00 877.705530
## [393,] -0.3292661855 -4.239893e-01 -1094.296201
## [394,] -0.0387509114 -4.173774e-01 -616.753713
## [395,] -0.0914857228 -5.267821e-01 1235.701134
## [396,] -0.0032988648 2.365746e+00 -5401.205570

```

```
## [397,] -0.0504257714 1.620832e+00 -374.985866
## [398,] -0.6998993292 -1.783530e+00 384.211324
## [399,] -0.3370966132 5.457633e+00 -704.020737
## [400,] -0.1461759289 -6.886560e-01 -419.158664
```

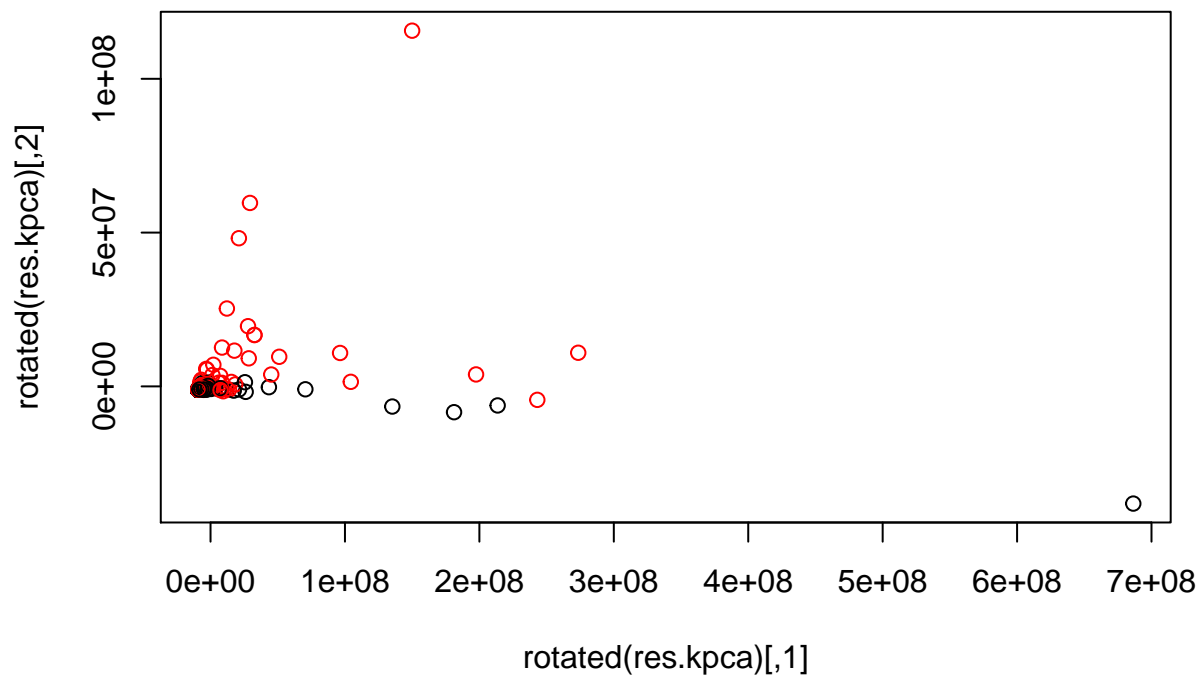
```
emb <- predict(res.kpca,spam[-train,ncol(spam)])
points(emb,col=as.integer(spam[-train,ncol(spam)]))
```



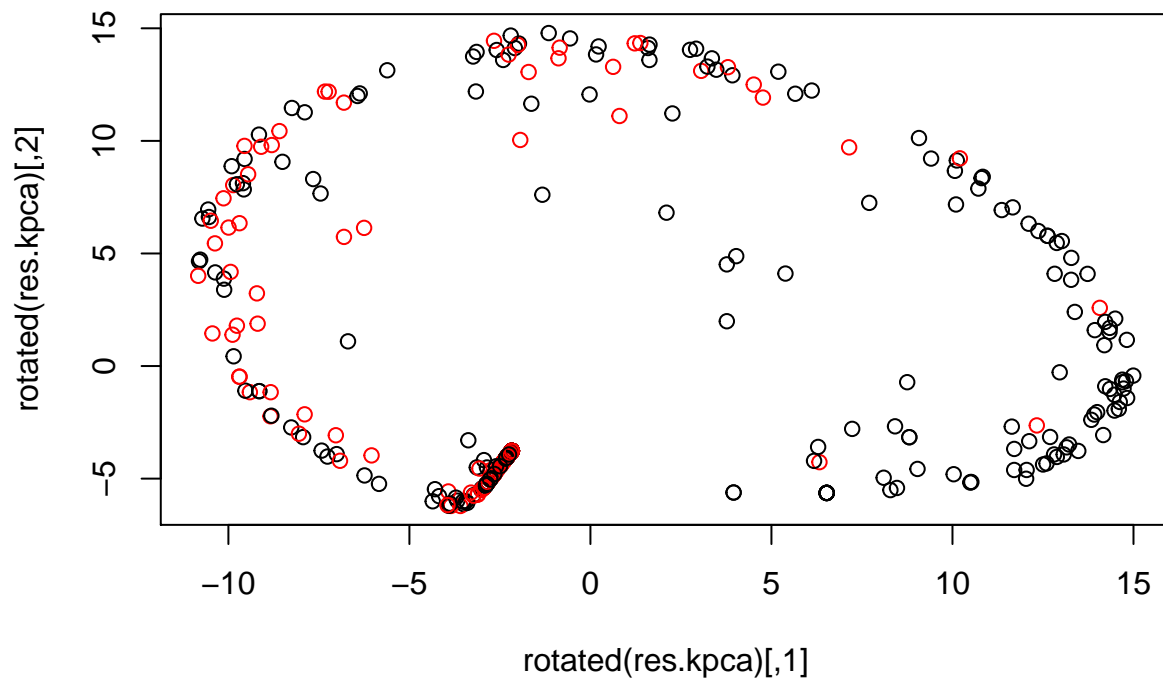
```
# calculer le pourcentage de la premiere principale composante
cumsum(eig(res.kpca))/sum(eig(res.kpca))
```

```
## Comp.1 Comp.2 Comp.3 Comp.4 Comp.5 Comp.6 Comp.7
## 0.9538187 0.9981514 0.9999116 0.9999498 0.9999592 0.9999654 0.9999695
## Comp.8 Comp.9 Comp.10 Comp.11 Comp.12 Comp.13 Comp.14
## 0.9999729 0.9999758 0.9999786 0.9999809 0.9999830 0.9999848 0.9999862
## Comp.15 Comp.16 Comp.17 Comp.18 Comp.19 Comp.20 Comp.21
## 0.9999874 0.9999885 0.9999895 0.9999904 0.9999913 0.9999920 0.9999927
## Comp.22 Comp.23 Comp.24 Comp.25 Comp.26 Comp.27 Comp.28
## 0.9999934 0.9999940 0.9999945 0.9999951 0.9999956 0.9999961 0.9999966
## Comp.29 Comp.30 Comp.31 Comp.32 Comp.33 Comp.34 Comp.35
## 0.9999970 0.9999974 0.9999978 0.9999981 0.9999983 0.9999986 0.9999988
## Comp.36 Comp.37 Comp.38 Comp.39 Comp.40 Comp.41 Comp.42
## 0.9999989 0.9999990 0.9999992 0.9999993 0.9999994 0.9999995 0.9999995
## Comp.43 Comp.44 Comp.45 Comp.46 Comp.47 Comp.48 Comp.49
## 0.9999996 0.9999997 0.9999997 0.9999998 0.9999998 0.9999999 0.9999999
## Comp.50 Comp.51 Comp.52 Comp.53 Comp.54 Comp.55 Comp.56
## 1.0000000 1.0000000 1.0000000 1.0000000 1.0000000 1.0000000 1.0000000
## Comp.57
## 1.0000000
```

```
res.kpca <- kpca(~., data = X, kernel = "polydot", kpar = list(degree = 2), features = 2)
plot(rotated(res.kpca), col = as.integer(spam[train,58]))
```



```
res.kpca <- kpca(~., data = X, kernel = "rbfdot", kpar = list(sigma = 1/500), features = 2)
plot(rotated(res.kpca), col = as.integer(spam[train,58]))
```



```
# another example using the iris
data(iris)
test <- sample(1:150,20)

kpc <- kpca(~.,data=iris[-test,-5],kernel="rbfdot",
           kpar=list(sigma=0.2),features=2)
```

```
#print the principal component vectors
```

pcv(kpc)

```
##          [,1]          [,2]
## [1,] -0.212616968  0.028222075
## [2,] -0.209463320  0.039013578
## [3,] -0.203969380  0.014729364
## [4,] -0.212842755  0.035346394
## [5,] -0.191586989 -0.003549261
## [6,] -0.208803472  0.034267815
## [7,] -0.212011843  0.013271189
## [8,] -0.193385086  0.028883792
## [9,] -0.207352428  0.008712650
## [10,] -0.202998449  0.019950376
## [11,] -0.209520987  0.006534408
## [12,] -0.205201536  0.021617203
## [13,] -0.190626217  0.067770022
## [14,] -0.180728222  0.061826101
## [15,] -0.166574898  0.048085973
## [16,] -0.198759205  0.045145465
## [17,] -0.212036675  0.023599613
## [18,] -0.182935536 -0.008569965
## [19,] -0.207100267  0.026777314
## [20,] -0.198370683 -0.026028344
## [21,] -0.207621646  0.016728375
## [22,] -0.204039096  0.081575099
## [23,] -0.199815538 -0.042600163
## [24,] -0.197932547 -0.037490750
## [25,] -0.201896398 -0.019400230
## [26,] -0.207584638 -0.011591877
## [27,] -0.210847932  0.021269462
## [28,] -0.205960274  0.001099903
## [29,] -0.204859188 -0.007472992
## [30,] -0.201876741 -0.006740440
## [31,] -0.196504805  0.048955700
## [32,] -0.186016874  0.055314168
## [33,] -0.207455208  0.003089566
## [34,] -0.210779205  0.042104929
## [35,] -0.202779556  0.033069212
## [36,] -0.212617248  0.042296103
## [37,] -0.196805525  0.042708440
## [38,] -0.211106296  0.010437676
## [39,] -0.165815553  0.021366969
## [40,] -0.201315064  0.048696690
## [41,] -0.202642683 -0.015428169
## [42,] -0.191683000 -0.033268601
## [43,] -0.204797797  0.011604400
## [44,] -0.205640976  0.019219334
## [45,] -0.207190795  0.030807875
## [46,] -0.205894070  0.021663699
## [47,]  0.125626089  0.075273822
## [48,]  0.132167447 -0.108580931
## [49,]  0.136597117  0.123557838
## [50,]  0.139679729 -0.095079820
## [51,]  0.118090819 -0.314571180
```

```

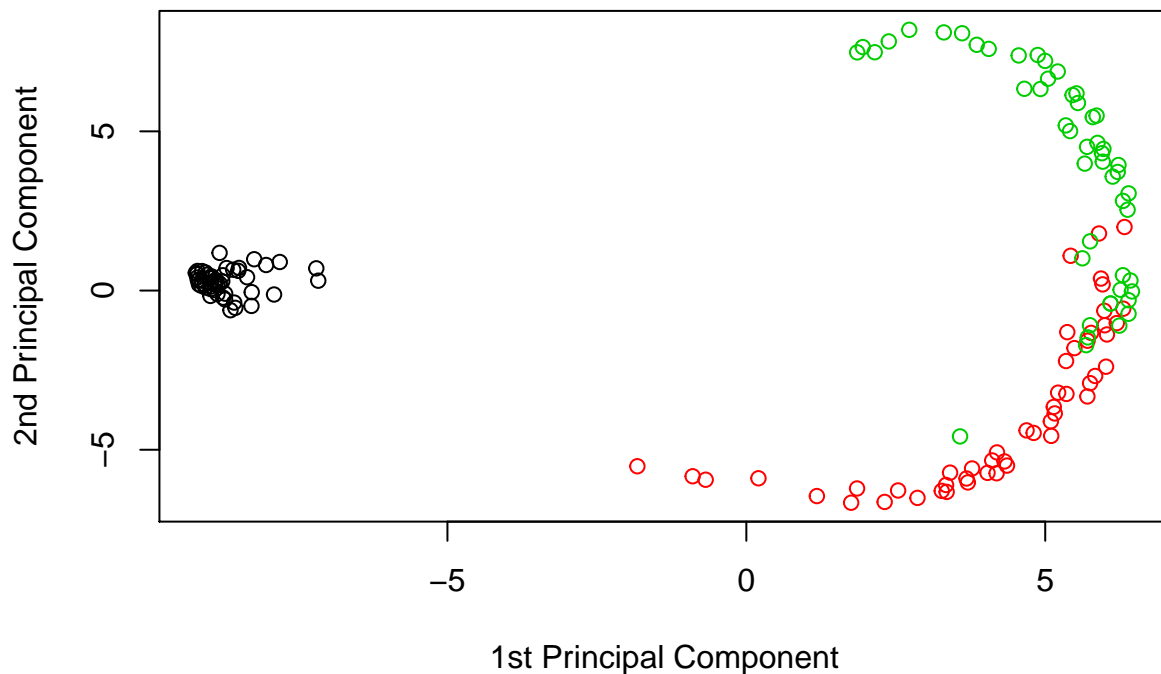
## [52,] 0.138653608 -0.043834515
## [53,] -0.020784125 -0.402028469
## [54,] 0.133527199 -0.091630581
## [55,] 0.058790932 -0.432798337
## [56,] 0.004697512 -0.406392936
## [57,] 0.111285668 -0.308203567
## [58,] 0.078920558 -0.394204019
## [59,] 0.139330048 -0.164833237
## [60,] 0.124310512 -0.090047885
## [61,] 0.085292133 -0.406895223
## [62,] 0.123995800 -0.223793345
## [63,] 0.066300459 -0.448862548
## [64,] 0.138825103 -0.075196011
## [65,] 0.097090439 -0.350399856
## [66,] 0.143494714 -0.070492866
## [67,] 0.133153163 -0.200510515
## [68,] 0.120769581 -0.221057873
## [69,] 0.127093641 -0.124611559
## [70,] 0.137368335 0.025972454
## [71,] 0.146477614 0.137534300
## [72,] 0.132101666 -0.229269827
## [73,] 0.027322125 -0.444924440
## [74,] 0.053578464 -0.457601872
## [75,] 0.040599756 -0.459276886
## [76,] 0.077354099 -0.420932140
## [77,] 0.145996989 -0.039246783
## [78,] 0.108545255 -0.302767543
## [79,] 0.123839307 -0.152599941
## [80,] 0.138001492 0.013323432
## [81,] 0.119087169 -0.251855578
## [82,] 0.087455044 -0.385147591
## [83,] 0.077595859 -0.435833287
## [84,] 0.100961513 -0.378963082
## [85,] 0.085799083 -0.415397928
## [86,] -0.015744393 -0.409540357
## [87,] 0.096943431 -0.395518478
## [88,] 0.100019836 -0.369930379
## [89,] 0.119468882 -0.266017800
## [90,] 0.093423056 -0.394688586
## [91,] 0.107685283 0.436792069
## [92,] 0.141070179 -0.028131604
## [93,] 0.112880951 0.509939682
## [94,] 0.063100042 0.564440342
## [95,] 0.082786088 -0.315791881
## [96,] 0.083587303 0.556985417
## [97,] 0.145898171 0.194074329
## [98,] 0.135666315 0.378700584
## [99,] 0.133112107 -0.075106622
## [100,] 0.130174000 0.069757003
## [101,] 0.138059944 0.279053598
## [102,] 0.144147249 0.271756928
## [103,] 0.045115317 0.527073880
## [104,] 0.042946268 0.515628763
## [105,] 0.131614167 -0.118226912

```

```
## [106,] 0.120618149 0.474191827
## [107,] 0.132255720 -0.101456085
## [108,] 0.055181419 0.539272768
## [109,] 0.149367218 -0.001925632
## [110,] 0.127902815 0.426769093
## [111,] 0.105498385 0.508926291
## [112,] 0.148037094 -0.050262619
## [113,] 0.148058156 -0.020850114
## [114,] 0.138308574 0.306541138
## [115,] 0.113923574 0.436310332
## [116,] 0.093884648 0.523142461
## [117,] 0.148774036 0.021752182
## [118,] 0.133152957 0.106484512
## [119,] 0.076493376 0.558796198
## [120,] 0.123737223 0.357489474
## [121,] 0.144465225 -0.075987392
## [122,] 0.126367253 0.423209111
## [123,] 0.141070179 -0.028131604
## [124,] 0.115707859 0.497156997
## [125,] 0.116866824 0.458600935
## [126,] 0.137754221 0.297279068
## [127,] 0.145878102 0.033169292
## [128,] 0.148067600 0.210359255
## [129,] 0.131079956 0.274798969
## [130,] 0.144966892 0.001673749
```

```
#plot the data projection on the components
plot(rotated(kpc),col=as.integer(iris[-test,5]),
     xlab="1st Principal Component",ylab="2nd Principal Component")

#embed remaining points
emb <- predict(kpc,iris[test,-5])
points(emb,col=as.integer(iris[test,5]))
```



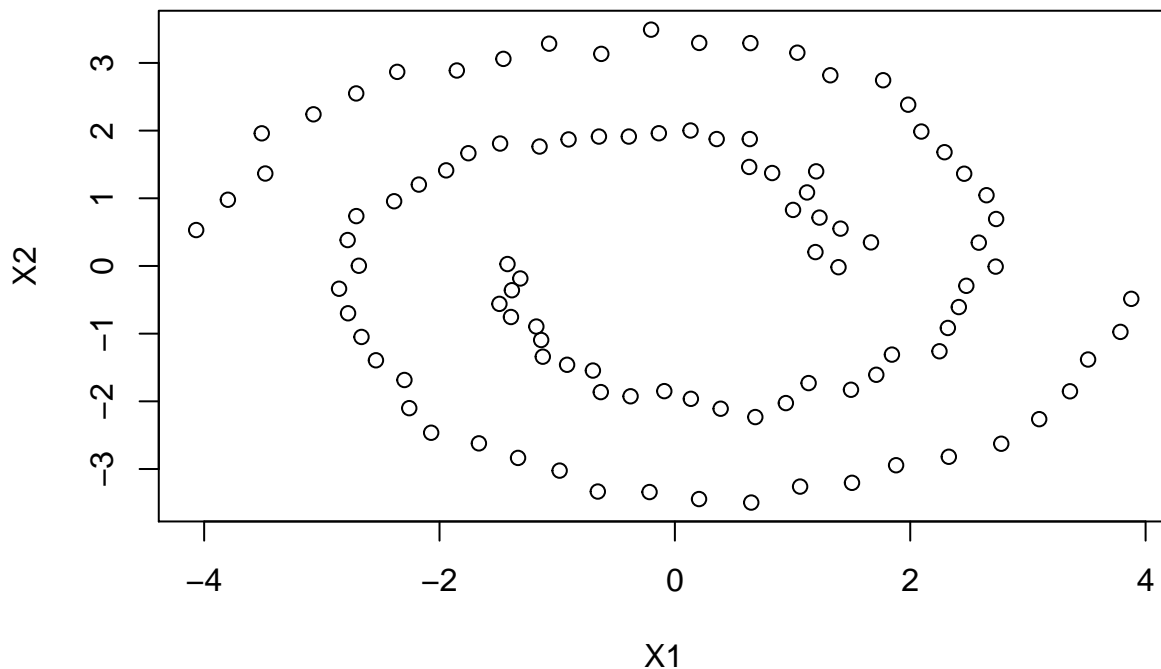

```

#noyau linéaire
K <- as.matrix(X) %*% t(as.matrix(X))

#noyau gaussien
# for (i in 1:nrow(X)) {
#   for (j in 1:i) {
#     K[i,j] <- exp(sum((X[i,]-X[j,])^2/sigma^2))
#   }
# }

library(mlbench)
set.seed(111)
obj <- mlbench.spirals(n = 100,cycles = 1,sd = 0.025)
my.data <- data.frame(4 * obj$x)
names(my.data)<-c("X1","X2")
plot(my.data)

```



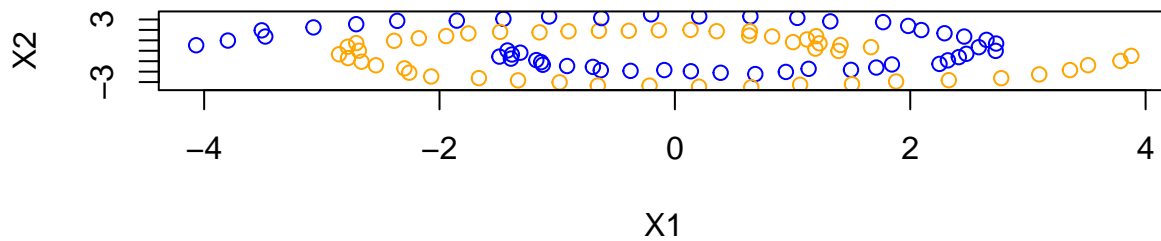
```

my.data<-as.matrix(my.data)

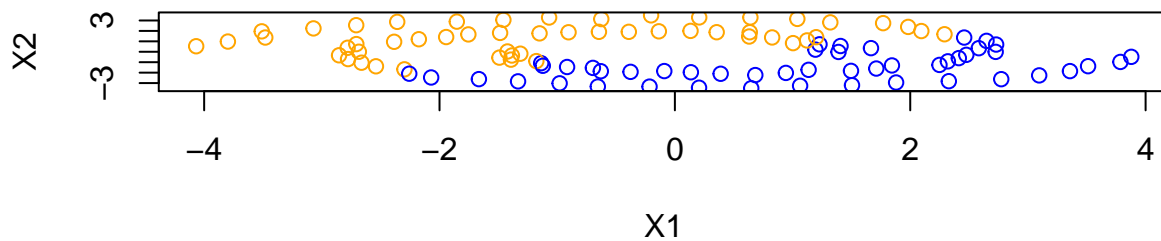
par(mfrow = c(2,1))
plot(my.data, col = c('orange', 'blue')[obj$classes], main = "True Classes")
plot(my.data, col = c('orange', 'blue')[kmeans(my.data,2)$cluster], main = "Kmeans")

```

True Classes



Kmeans

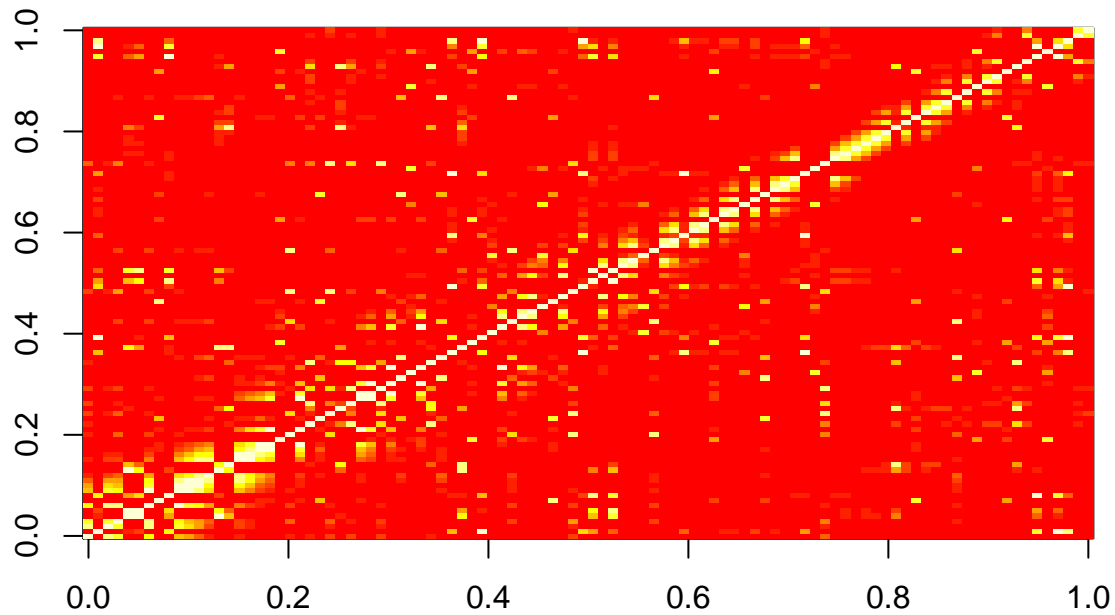


```
# method 1
library(KRLS)

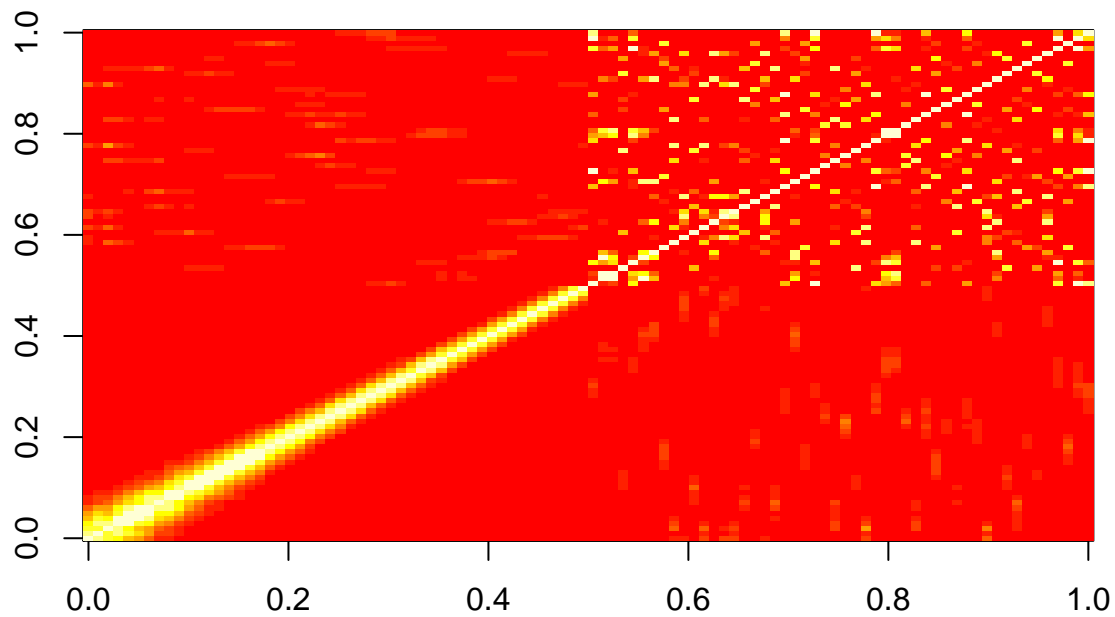
## ## KRLS Package for Kernel-based Regularized Least Squares.
## ## See Hainmueller and Hazlett (2014) for details.
K <- gausskernel(X = my.data, sigma = 1)

# my method
sigma <- 1
my.K <- matrix(NA, nrow(my.data), nrow(my.data))
for (i in 1:nrow(my.data)) {
  for (j in 1:nrow(my.data)) {
    my.K[i,j] <- exp(-((my.data[i,]-my.data[j,])%*%(my.data[i,]-my.data[j,]))/sigma)
  }
}

# prof
K <- exp(-as.matrix(dist(my.data))^2/sigma)
image(K)
```



```
classes <- obj$classes
image(K[order(classes), order(classes)])
```



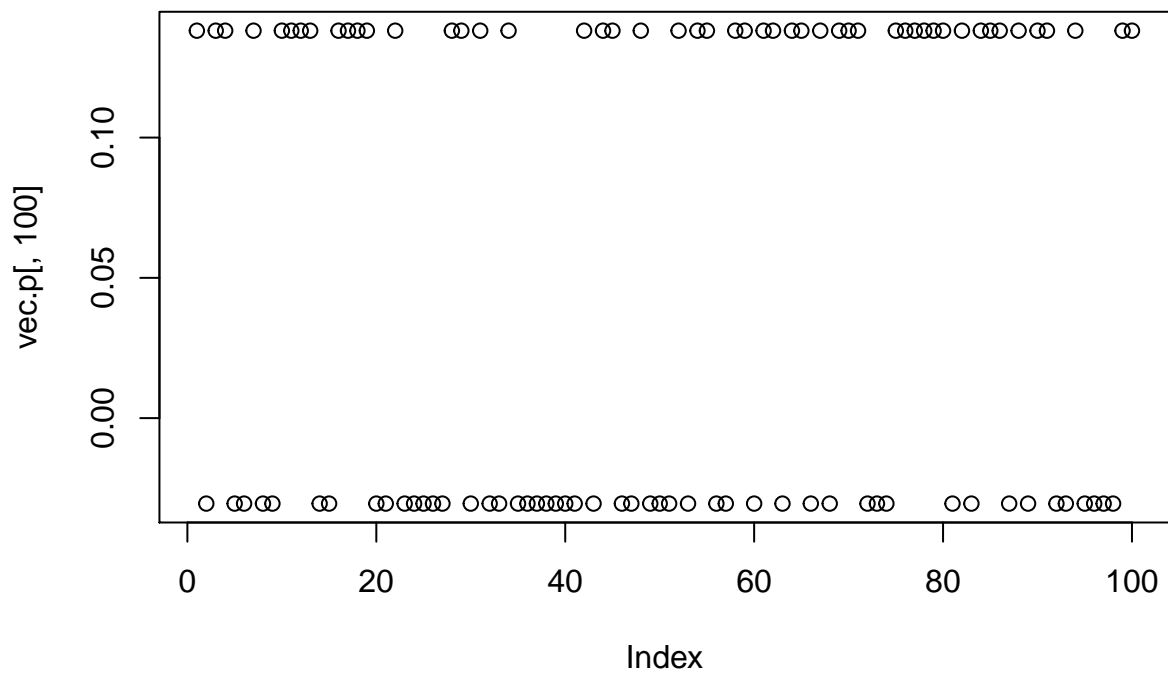
dist() calculate the $\|x_i - x_j\|^2$ of matrix

```
A <- (K > 0.5) * K
diag(A) <- 0

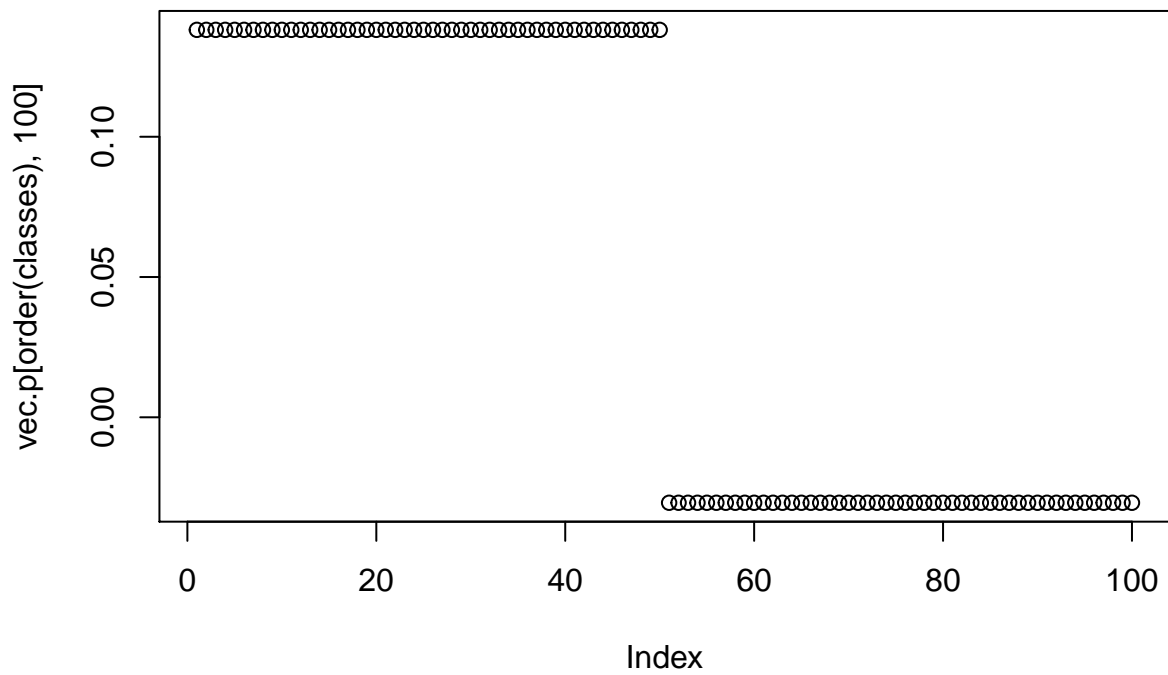
D <- diag(colSums(A))
L <- D - A

val.p <- eigen(L)$values
vec.p <- eigen(L)$vectors

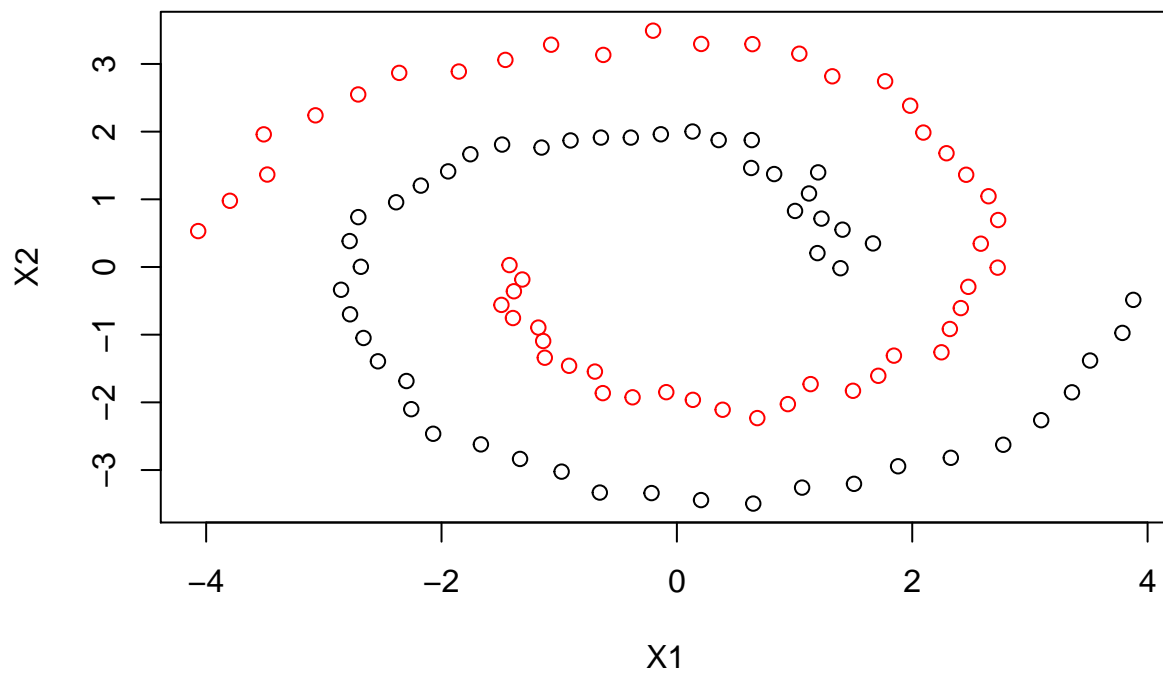
plot(vec.p[,100])
```



```
plot(vec.p[order(classes),100])
```



```
spectral.classes <- kmeans(vec.p[,100],2)$cluster
plot(my.data, col = spectral.classes)
```

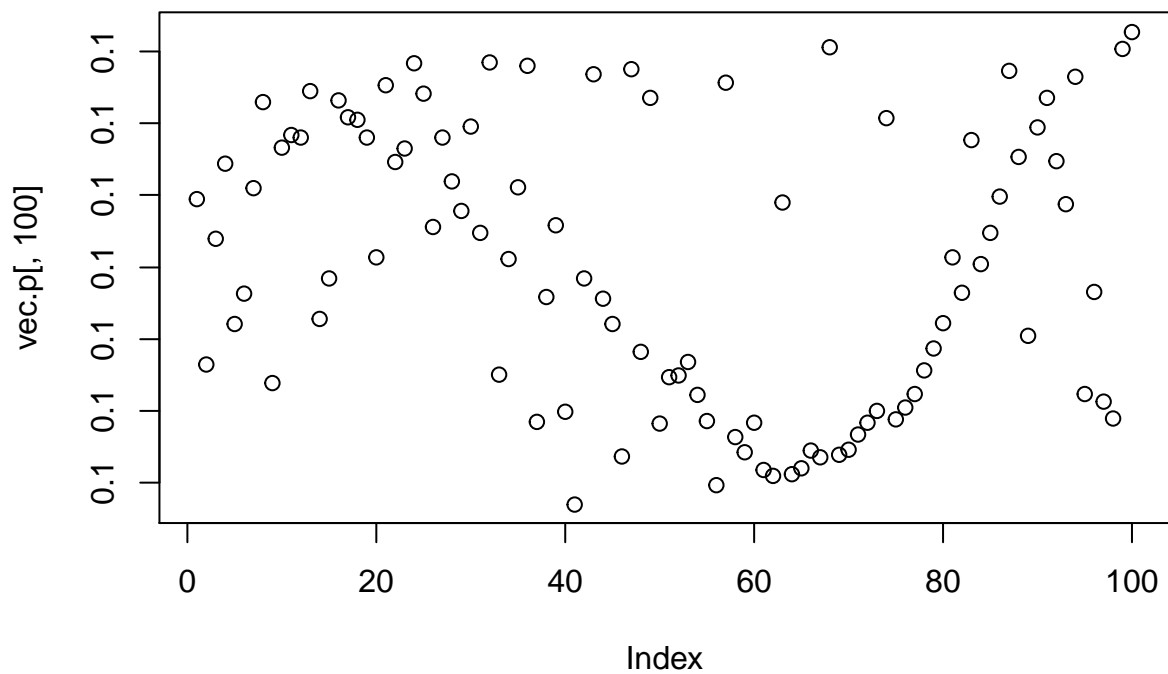


```
A <- K
diag(A) <- 0

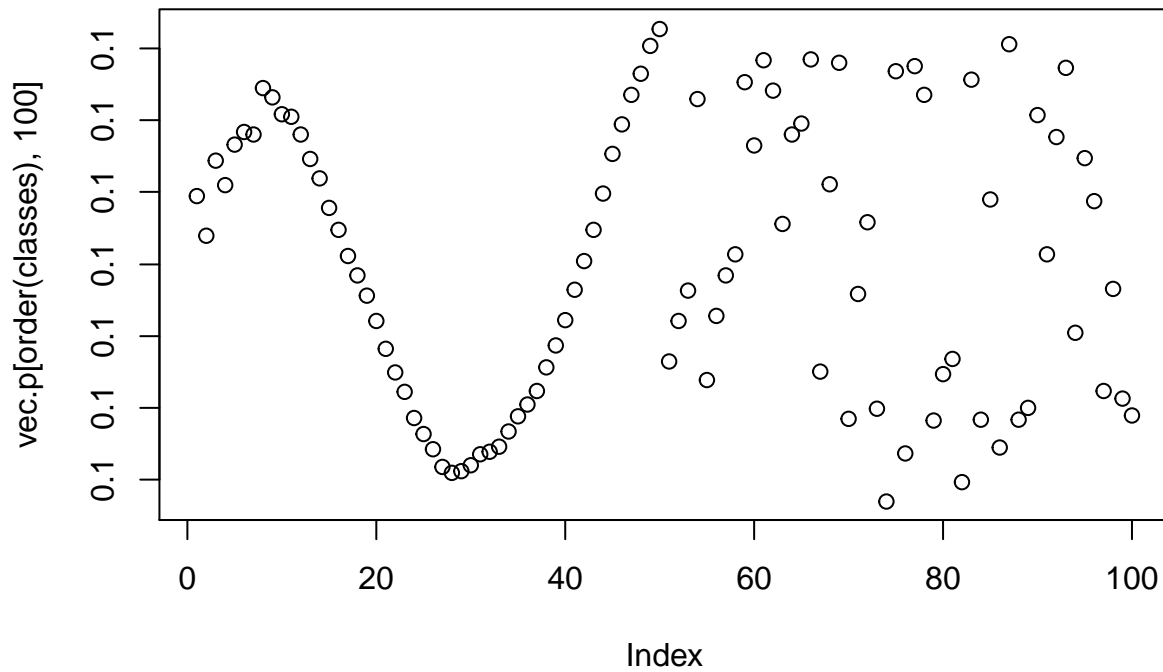
D <- diag(colSums(A))
L <- D - A

val.p <- eigen(L)$values
vec.p <- eigen(L)$vectors

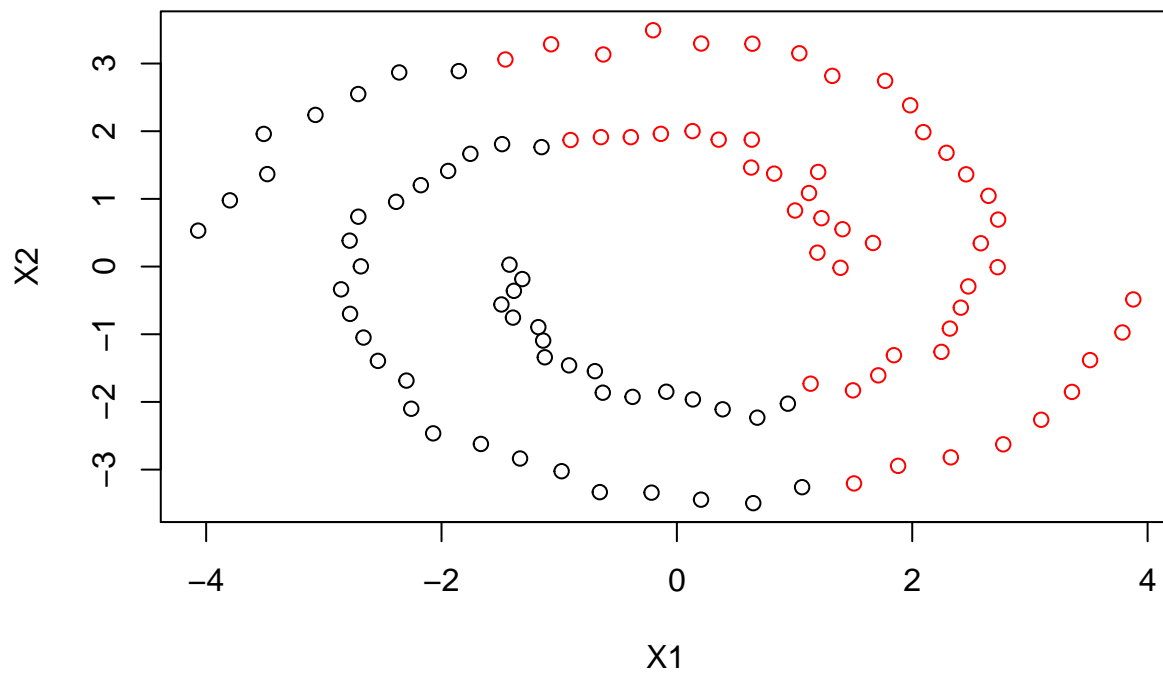
plot(vec.p[,100])
```



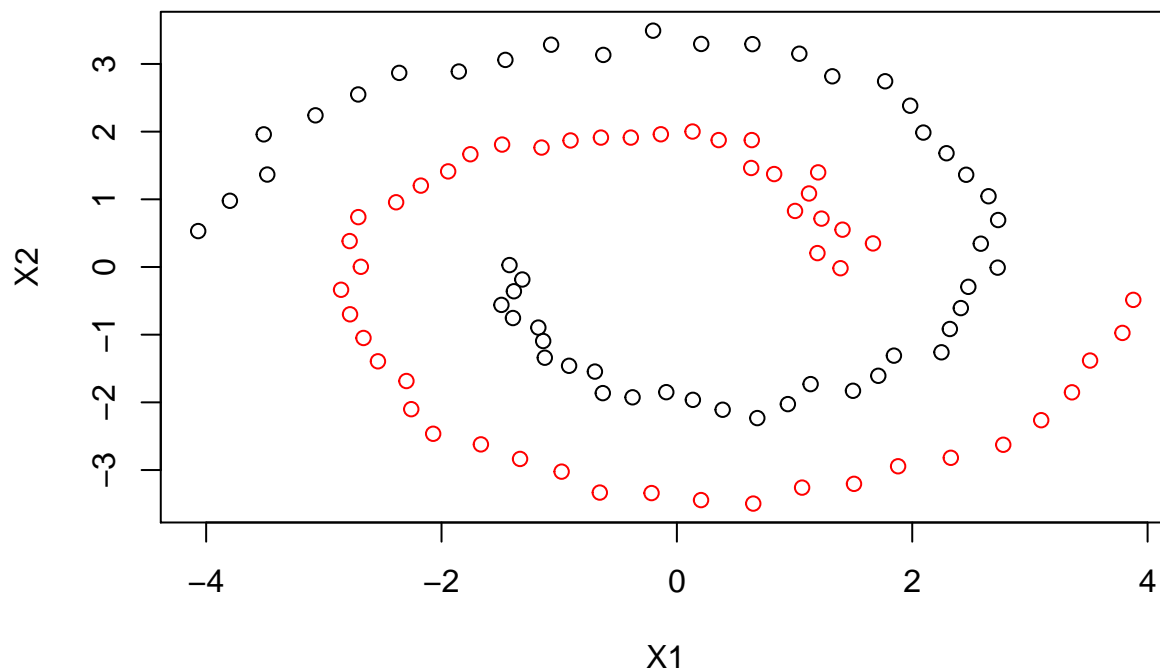
```
plot(vec.p[order(classes),100])
```



```
spectral.classes <- kmeans(vec.p[,100],2)$cluster
plot(my.data, col = spectral.classes)
```



```
library(kernlab)
sc <- specc(my.data, centers = 2)
plot(my.data, col=sc)
```



```
res.kpca <- kpca(~., data = as.data.frame(my.data), kernel = "rbfdot", kpar = list(sigma=2), features =
eig(res.kpca)
```

```
##      Comp.1      Comp.2      Comp.3
## 0.05245700 0.04643535 0.04296493
```

```
pcv(res.kpca)
```

```
##           [,1]      [,2]      [,3]
## [1,]  0.433641801 -0.58319216  0.581824764
## [2,] -1.216498955 -0.84113131 -0.256107444
## [3,]  0.580327741 -0.84678380  0.672354059
## [4,]  0.540386731 -0.73654339  0.673147023
## [5,] -0.340343974  0.28525782  0.759169661
## [6,] -0.466642483  0.15196295  0.708598384
## [7,]  0.752200602 -1.11731119  0.755381511
## [8,]  0.045547170  0.17770753 -0.005388329
## [9,] -0.904215091 -0.37318348  0.318435919
## [10,] 0.849695834 -1.27403889  0.681072372
## [11,] 0.854128770 -1.26008341  0.496955147
## [12,] 0.885206446 -1.27254059  0.339652784
## [13,] 0.738379465 -0.98676262  0.080095998
## [14,] -0.223764131  0.38542681  0.754030290
## [15,] -0.081934126  0.48243091  0.682861524
## [16,] 0.821825121 -1.04332673 -0.192059752
## [17,] 0.748680735 -0.84322536 -0.476461323
## [18,] 0.604934698 -0.52742510 -0.748399149
## [19,] 0.586651318 -0.37655044 -1.053588889
## [20,] 0.038353530  0.20754957 -0.050712446
## [21,] 0.098561935  0.17447161  0.252174039
## [22,] 0.500890685 -0.15886703 -1.223493225
## [23,] 0.050040385  0.39530457  0.401543895
## [24,] 0.063143068  0.15905833  0.007475391
```

```

## [25,] 0.096104237 0.22330205 0.313536458
## [26,] -0.001906706 0.48558593 0.559057654
## [27,] 0.068227886 0.36659270 0.398807249
## [28,] 0.441905991 0.02408484 -1.372180017
## [29,] 0.373361718 0.18802955 -1.413699564
## [30,] 0.086308516 0.31186721 0.383118757
## [31,] 0.307494678 0.31564524 -1.366181771
## [32,] 0.068859489 0.15450200 0.069063464
## [33,] 0.027675255 0.18430586 0.004489636
## [34,] 0.248500316 0.40323051 -1.247656339
## [35,] 0.039311916 0.44428362 0.474048760
## [36,] 0.095671548 0.12600611 0.104521830
## [37,] -0.997712511 -0.79091309 -0.562213239
## [38,] -0.127355547 0.42880920 0.679035739
## [39,] 0.036885781 0.19385424 -0.035202132
## [40,] -1.237863076 -0.91161524 -0.404767266
## [41,] 0.018549986 0.12912118 0.024646297
## [42,] 0.196867786 0.45283321 -1.079614809
## [43,] 0.101625163 0.14203644 0.182366628
## [44,] 0.144591134 0.47109670 -0.841520723
## [45,] 0.109894181 0.46755959 -0.653634393
## [46,] 0.024376773 0.18033638 0.016198774
## [47,] 0.048550596 0.17345623 0.005958743
## [48,] 0.083425672 0.44992347 -0.497389430
## [49,] 0.123002270 0.16340242 0.322899831
## [50,] -1.074881380 -0.84166464 -0.553326803
## [51,] -0.699391690 -0.15028453 0.476455648
## [52,] 0.059605437 0.41353589 -0.341537569
## [53,] -0.584001110 0.01023293 0.617560239
## [54,] 0.040819139 0.37390502 -0.218271067
## [55,] 0.029372619 0.32978220 -0.111865463
## [56,] 0.022275067 0.16267581 0.023905154
## [57,] 0.095900925 0.16312186 0.214650773
## [58,] 0.015562010 0.29704291 -0.062023832
## [59,] -0.011146640 0.25227348 -0.037567087
## [60,] -0.615431774 -0.46608637 -0.404327110
## [61,] -0.008887781 0.23612531 -0.006302998
## [62,] -0.022877073 0.21458209 0.004319003
## [63,] 0.049173214 0.19243792 -0.081991070
## [64,] -0.035029644 0.19490372 0.012395793
## [65,] -0.038205566 0.18317154 0.023487273
## [66,] 0.022980551 0.16002273 0.024719994
## [67,] -0.052122473 0.16447035 0.031798246
## [68,] 0.053851575 0.16475913 0.043557192
## [69,] -0.018090253 0.18459384 0.051673308
## [70,] -0.006323901 0.18710018 0.062537289
## [71,] -0.016547046 0.18767162 0.080120629
## [72,] -0.837208776 -0.66021224 -0.504385334
## [73,] 0.025585059 0.17562620 0.015934054
## [74,] 0.105993756 0.24950057 0.372433808
## [75,] -0.015439007 0.19040786 0.093000117
## [76,] -0.009633147 0.19397766 0.099523246
## [77,] 0.007744269 0.19321831 0.087220607
## [78,] 0.009838616 0.20045885 0.096787431

```



```
## [79,] 0.015103516 0.20167677 0.096215067
## [80,] 0.017791627 0.19930254 0.094508910
## [81,] -0.036396697 0.48500342 0.617296958
## [82,] 0.016593049 0.21355516 0.115449058
## [83,] 0.046408304 0.18001291 -0.026056132
## [84,] 0.020261379 0.20513849 0.100256817
## [85,] 0.021853071 0.20592924 0.099632964
## [86,] 0.023445062 0.18951969 0.078204219
## [87,] 0.100701766 0.13016622 0.142777310
## [88,] 0.023731385 0.17631654 0.063687698
## [89,] 0.028822138 0.18582569 -0.003743875
## [90,] 0.024244082 0.17385966 0.061097034
## [91,] 0.024663558 0.17209353 0.061156955
## [92,] 0.036622469 0.17667061 -0.014162478
## [93,] 0.020556454 0.47753274 0.520060395
## [94,] 0.025305469 0.17048935 0.063219979
## [95,] -1.030605758 -0.55082839 0.128418925
## [96,] 0.036024552 0.20839671 -0.045756255
## [97,] -1.102553238 -0.68644336 -0.067043022
## [98,] -1.186274745 -0.91074545 -0.514823979
## [99,] 0.023571146 0.15378472 0.052483574
## [100,] 0.021096109 0.12985208 0.044386071
```

```
pairs(pcv(res.kpca), col=obj$classes)
```

