

deeplearning.R

DrJohan

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```
# Install packages
library(keras)
setwd("E:/Data_analysis/Ai_ctg")

# Read data
data <- read.csv("Cardiotocographic.csv", header = T)
str(data)

## 'data.frame': 2126 obs. of 22 variables:
## $ LB : int 120 132 133 134 132 134 134 122 122 122 ...
## $ AC : num 0 0.00638 0.00332 0.00256 0.00651 ...
## $ FM : num 0 0 0 0 0 0 0 0 0 ...
## $ UC : num 0 0.00638 0.00831 0.00768 0.00814 ...
## $ DL : num 0 0.00319 0.00332 0.00256 0 ...
## $ DS : num 0 0 0 0 0 0 0 0 0 ...
## $ DP : num 0 0 0 0 0 ...
## $ ASTV : int 73 17 16 16 16 26 29 83 84 86 ...
## $ MSTV : num 0.5 2.1 2.1 2.4 2.4 5.9 6.3 0.5 0.5 0.3 ...
## $ ALTV : int 43 0 0 0 0 0 0 6 5 6 ...
## $ MLTV : num 2.4 10.4 13.4 23 19.9 0 0 15.6 13.6 10.6 ...
## $ Width : int 64 130 130 117 117 150 150 68 68 68 ...
## $ Min : int 62 68 68 53 53 50 50 62 62 62 ...
## $ Max : int 126 198 198 170 170 200 200 130 130 130 ...
## $ Nmax : int 2 6 5 11 9 5 6 0 0 1 ...
## $ Nzeros : int 0 1 1 0 0 3 3 0 0 0 ...
## $ Mode : int 120 141 141 137 137 76 71 122 122 122 ...
## $ Mean : int 137 136 135 134 136 107 107 122 122 122 ...
## $ Median : int 121 140 138 137 138 107 106 123 123 123 ...
## $ Variance: int 73 12 13 13 11 170 215 3 3 1 ...
## $ Tendency: int 1 0 0 1 1 0 0 1 1 1 ...
## $ NSP : int 2 1 1 1 1 3 3 3 3 3 ...

# Change to matrix
data <- as.matrix(data)
dimnames(data) <- NULL

# Normalize
data[, 1:21] <- normalize(data[, 1:21])
data[,22] <- as.numeric(data[,22]) -1
summary(data)

## V1 V2 V3
## Min. :0.2894 Min. :0.000e+00 Min. :0.000e+00
## 1st Qu.:0.3747 1st Qu.:0.000e+00 1st Qu.:0.000e+00
## Median :0.3862 Median :4.572e-06 Median :0.000e+00
## Mean :0.3833 Mean :8.915e-06 Mean :2.721e-05
## 3rd Qu.:0.3949 3rd Qu.:1.596e-05 3rd Qu.:7.171e-06
## Max. :0.4537 Max. :5.983e-05 Max. :1.446e-03
```

```
##          V4          V5          V6
## Min.    :0.000e+00  Min.    :0.000e+00  Min.    :0.000e+00
## 1st Qu.:5.398e-06  1st Qu.:0.000e+00  1st Qu.:0.000e+00
## Median :1.286e-05  Median :0.000e+00  Median :0.000e+00
## Mean    :1.264e-05  Mean    :5.560e-06  Mean    :1.208e-08
## 3rd Qu.:1.900e-05  3rd Qu.:9.478e-06  3rd Qu.:0.000e+00
## Max.    :4.244e-05  Max.    :4.997e-05  Max.    :4.821e-06
##          V7          V8          V9
## Min.    :0.000e+00  Min.    :0.03438  Min.    :0.0005181
## 1st Qu.:0.000e+00  1st Qu.:0.09199  1st Qu.:0.0019697
## Median :0.000e+00  Median :0.13506  Median :0.0033797
## Mean    :4.733e-07  Mean    :0.13498  Mean    :0.0038681
## 3rd Qu.:0.000e+00  3rd Qu.:0.17348  3rd Qu.:0.0051435
## Max.    :1.734e-05  Max.    :0.28247  Max.    :0.0193124
##          V10         V11         V12         V13
## Min.    :0.00000  Min.    :0.00000  Min.    :0.008531  Min.    :0.1171
## 1st Qu.:0.00000  1st Qu.:0.01276  1st Qu.:0.106336  1st Qu.:0.1929
## Median :0.00000  Median :0.02114  Median :0.197361  Median :0.2762
## Mean    :0.02772  Mean    :0.02370  Mean    :0.202034  Mean    :0.2689
## 3rd Qu.:0.03180  3rd Qu.:0.03173  3rd Qu.:0.291810  3rd Qu.:0.3454
## Max.    :0.27950  Max.    :0.13866  Max.    :0.482050  Max.    :0.3926
##          V14         V15         V16         V17
## Min.    :0.3867  Min.    :0.00000  Min.    :0.0000000  Min.    :0.1405
## 1st Qu.:0.4462  1st Qu.:0.00537  1st Qu.:0.0000000  1st Qu.:0.3895
## Median :0.4673  Median :0.01011  Median :0.0000000  Median :0.4017
## Mean    :0.4709  Mean    :0.01166  Mean    :0.0009312  Mean    :0.3942
## 3rd Qu.:0.4914  3rd Qu.:0.01705  3rd Qu.:0.0000000  3rd Qu.:0.4093
## Max.    :0.6333  Max.    :0.05029  Max.    :0.0246323  Max.    :0.4495
##          V18         V19         V20         V21
## Min.    :0.1929  Min.    :0.2321  Min.    :0.000000  Min.    : -0.0035625
## 1st Qu.:0.3813  1st Qu.:0.3913  1st Qu.:0.005879  1st Qu.: 0.0000000
## Median :0.3968  Median :0.4037  Median :0.020913  Median : 0.0000000
## Mean    :0.3862  Mean    :0.3961  Mean    :0.053473  Mean    : 0.0009039
## 3rd Qu.:0.4035  3rd Qu.:0.4094  3rd Qu.:0.068854  3rd Qu.: 0.0027577
## Max.    :0.4364  Max.    :0.4303  Max.    :0.655737  Max.    : 0.0035719
##          V22
## Min.    :0.0000
## 1st Qu.:0.0000
## Median :0.0000
## Mean    :0.3043
## 3rd Qu.:0.0000
## Max.    :2.0000
```

```
# Data partition
set.seed(1234)
ind <- sample(2, nrow(data), replace = T, prob = c(0.7, 0.3))
training <- data[ind==1, 1:21]
test <- data[ind==2, 1:21]
trainingtarget <- data[ind==1, 22]
testtarget <- data[ind==2, 22]

# One Hot Encoding
trainLabels <- to_categorical(trainingtarget)
testLabels <- to_categorical(testtarget)
```

```
print(testLabels)
```

```
##      [,1] [,2] [,3]
## [1,]    1    0    0
## [2,]    1    0    0
## [3,]    1    0    0
## [4,]    0    0    1
## [5,]    0    0    1
## [6,]    0    1    0
## [7,]    1    0    0
## [8,]    1    0    0
## [9,]    1    0    0
## [10,]   1    0    0
## [11,]   0    1    0
## [12,]   1    0    0
## [13,]   1    0    0
## [14,]   1    0    0
## [15,]   1    0    0
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## [19,]   1    0    0
## [20,]   0    1    0
## [21,]   0    1    0
## [22,]   1    0    0
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## [49,]   0    1    0
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## [51,]   0    1    0
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## [458,]	1	0	0
## [459,]	1	0	0
## [460,]	1	0	0
## [461,]	1	0	0
## [462,]	1	0	0
## [463,]	1	0	0
## [464,]	1	0	0
## [465,]	1	0	0
## [466,]	1	0	0
## [467,]	1	0	0
## [468,]	1	0	0
## [469,]	1	0	0
## [470,]	1	0	0
## [471,]	1	0	0
## [472,]	1	0	0
## [473,]	1	0	0
## [474,]	1	0	0
## [475,]	1	0	0
## [476,]	1	0	0
## [477,]	1	0	0
## [478,]	1	0	0
## [479,]	1	0	0
## [480,]	1	0	0
## [481,]	1	0	0
## [482,]	1	0	0
## [483,]	1	0	0

## [484,]	1	0	0
## [485,]	1	0	0
## [486,]	1	0	0
## [487,]	1	0	0
## [488,]	1	0	0
## [489,]	1	0	0
## [490,]	1	0	0
## [491,]	1	0	0
## [492,]	0	0	1
## [493,]	0	0	1
## [494,]	0	0	1
## [495,]	0	0	1
## [496,]	0	0	1
## [497,]	0	0	1
## [498,]	1	0	0
## [499,]	0	0	1
## [500,]	0	0	1
## [501,]	0	0	1
## [502,]	0	0	1
## [503,]	0	0	1
## [504,]	0	0	1
## [505,]	1	0	0
## [506,]	1	0	0
## [507,]	1	0	0
## [508,]	1	0	0
## [509,]	1	0	0
## [510,]	1	0	0
## [511,]	0	0	1
## [512,]	1	0	0
## [513,]	1	0	0
## [514,]	1	0	0
## [515,]	1	0	0
## [516,]	1	0	0
## [517,]	1	0	0
## [518,]	1	0	0
## [519,]	1	0	0
## [520,]	1	0	0
## [521,]	1	0	0
## [522,]	1	0	0
## [523,]	1	0	0
## [524,]	1	0	0
## [525,]	1	0	0
## [526,]	1	0	0
## [527,]	1	0	0
## [528,]	1	0	0
## [529,]	1	0	0
## [530,]	1	0	0
## [531,]	1	0	0
## [532,]	1	0	0
## [533,]	1	0	0
## [534,]	1	0	0
## [535,]	1	0	0
## [536,]	0	0	1
## [537,]	0	0	1

## [538,]	1	0	0
## [539,]	1	0	0
## [540,]	1	0	0
## [541,]	0	0	1
## [542,]	0	0	1
## [543,]	0	0	1
## [544,]	0	0	1
## [545,]	0	0	1
## [546,]	1	0	0
## [547,]	1	0	0
## [548,]	1	0	0
## [549,]	1	0	0
## [550,]	1	0	0
## [551,]	1	0	0
## [552,]	1	0	0
## [553,]	0	0	1
## [554,]	0	0	1
## [555,]	0	0	1
## [556,]	0	0	1
## [557,]	0	0	1
## [558,]	0	0	1
## [559,]	0	0	1
## [560,]	1	0	0
## [561,]	1	0	0
## [562,]	1	0	0
## [563,]	1	0	0
## [564,]	1	0	0
## [565,]	1	0	0
## [566,]	1	0	0
## [567,]	1	0	0
## [568,]	1	0	0
## [569,]	1	0	0
## [570,]	1	0	0
## [571,]	1	0	0
## [572,]	1	0	0
## [573,]	1	0	0
## [574,]	1	0	0
## [575,]	1	0	0
## [576,]	1	0	0
## [577,]	1	0	0
## [578,]	1	0	0
## [579,]	1	0	0
## [580,]	1	0	0
## [581,]	1	0	0
## [582,]	0	0	1
## [583,]	1	0	0
## [584,]	1	0	0
## [585,]	1	0	0
## [586,]	1	0	0
## [587,]	1	0	0
## [588,]	1	0	0
## [589,]	1	0	0
## [590,]	1	0	0
## [591,]	1	0	0

```
## [592,] 1 0 0
## [593,] 0 1 0
## [594,] 1 0 0
## [595,] 1 0 0
## [596,] 1 0 0
## [597,] 1 0 0
## [598,] 1 0 0
## [599,] 1 0 0
## [600,] 1 0 0
## [601,] 1 0 0
## [602,] 1 0 0
## [603,] 0 1 0
```

```
# Create sequential model
```

```
model <- keras_model_sequential()
model %>%
  layer_dense(units=8, activation = 'relu', input_shape = c(21)) %>%
  layer_dense(units = 3, activation = 'softmax')
summary(model)
```

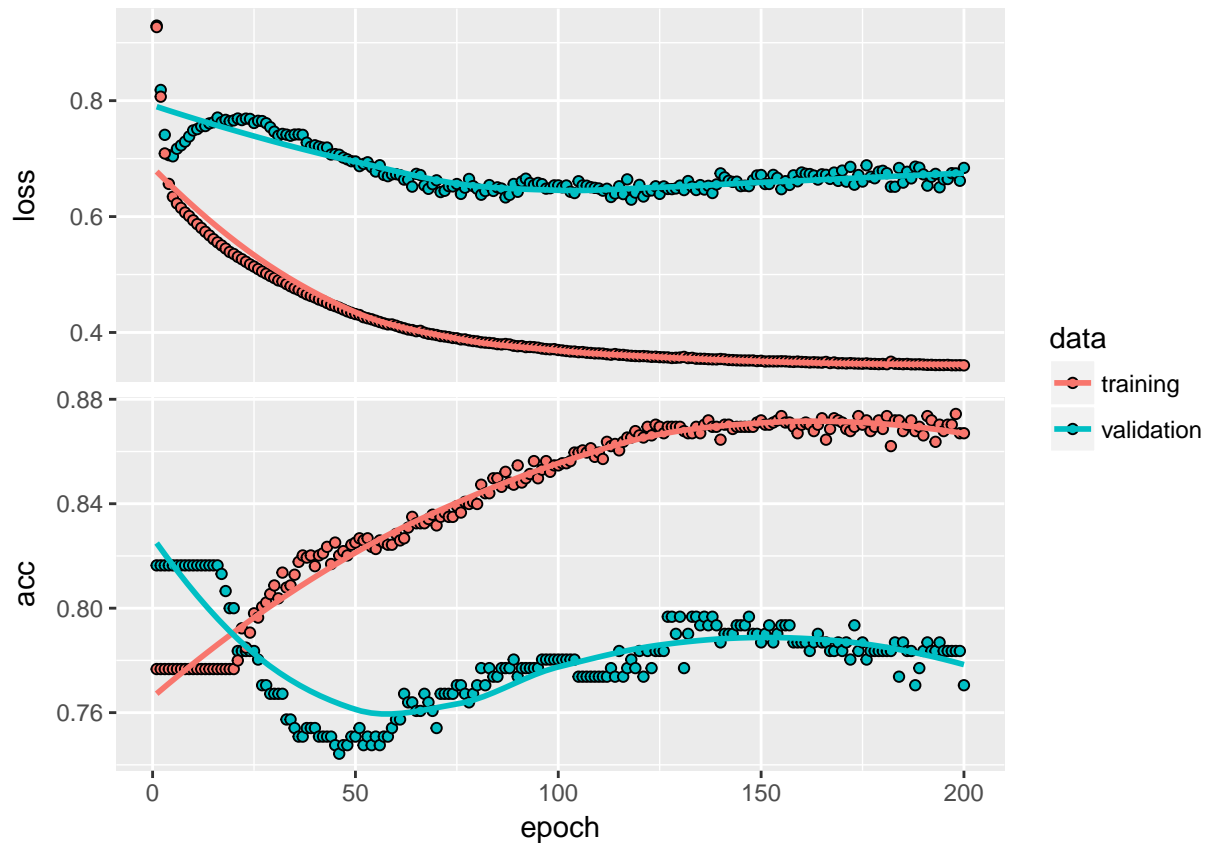
```
## -----
## Layer (type)                Output Shape                Param #
## =====
## dense_1 (Dense)             (None, 8)                   176
## -----
## dense_2 (Dense)             (None, 3)                   27
## =====
## Total params: 203
## Trainable params: 203
## Non-trainable params: 0
## -----
```

```
# Compile
```

```
model %>%
  compile(loss = 'categorical_crossentropy',
          optimizer = 'adam',
          metrics = 'accuracy')
```

```
# Fit model
```

```
history <- model %>%
  fit(training,
      trainLabels,
      epoch = 200,
      batch_size = 32,
      validation_split = 0.2)
plot(history)
```



```
# Evaluate model with test data
model %>%
  evaluate(test, testLabels)
```

```
## $loss
## [1] 0.4242283
##
## $acc
## [1] 0.8640133
```

```
# Prediction & confusion matrix - test data
prob <- model %>%
  predict_proba(test)
```

```
pred <- model %>%
  predict_classes(test)
table(Predicted = pred, Actual = testtarget)
```

```
##           Actual
## Predicted    0    1    2
##           0 429  36    8
##           1  25  56    5
##           2   6   2   36
```

```
cbind(prob, pred, testtarget)
```

```
##                                     pred testtarget
## [1,] 0.9930099249 0.0069547412 3.536093e-05      0      0
```

##	[2,]	0.9818447828	0.0179701634	1.850859e-04	0	0
##	[3,]	0.9835535288	0.0159227811	5.237905e-04	0	0
##	[4,]	0.0004768508	0.1494056880	8.501174e-01	2	2
##	[5,]	0.0004251794	0.1446524709	8.549223e-01	2	2
##	[6,]	0.9453395009	0.0415251590	1.313534e-02	0	1
##	[7,]	0.9833915234	0.0163523890	2.561529e-04	0	0
##	[8,]	0.9858560562	0.0139455702	1.983451e-04	0	0
##	[9,]	0.9837862849	0.0159805845	2.331863e-04	0	0
##	[10,]	0.9896434546	0.0102831880	7.334842e-05	0	0
##	[11,]	0.7895588279	0.0664575174	1.439836e-01	0	1
##	[12,]	0.7633285522	0.2264722735	1.019918e-02	0	0
##	[13,]	0.9776892662	0.0220598467	2.509624e-04	0	0
##	[14,]	0.9098814130	0.0879170373	2.201499e-03	0	0
##	[15,]	0.7416566610	0.2468364686	1.150684e-02	0	0
##	[16,]	0.9253559709	0.0727713108	1.872781e-03	0	0
##	[17,]	0.9303951263	0.0678155199	1.789381e-03	0	0
##	[18,]	0.9820736647	0.0177660435	1.602201e-04	0	0
##	[19,]	0.9674013257	0.0321153551	4.832785e-04	0	0
##	[20,]	0.9227661490	0.0629382432	1.429560e-02	0	1
##	[21,]	0.0442817509	0.6257089972	3.300092e-01	1	1
##	[22,]	0.9910945296	0.0088441540	6.135931e-05	0	0
##	[23,]	0.9851155877	0.0145546421	3.297102e-04	0	0
##	[24,]	0.9737524986	0.0259001590	3.472632e-04	0	0
##	[25,]	0.9610003829	0.0313099362	7.689578e-03	0	0
##	[26,]	0.7247934341	0.0695580766	2.056485e-01	0	2
##	[27,]	0.9819620252	0.0178496726	1.883775e-04	0	0
##	[28,]	0.6397080421	0.2981977165	6.209422e-02	0	0
##	[29,]	0.4655812383	0.4411806166	9.323820e-02	0	0
##	[30,]	0.6811645627	0.2891252041	2.971025e-02	0	0
##	[31,]	0.9648691416	0.0321209133	3.010023e-03	0	0
##	[32,]	0.5609670877	0.4085825086	3.045048e-02	0	0
##	[33,]	0.8782683611	0.1183870584	3.344560e-03	0	0
##	[34,]	0.8774958253	0.1191162094	3.387942e-03	0	0
##	[35,]	0.8340572715	0.1597584933	6.184140e-03	0	1
##	[36,]	0.9716965556	0.0278386157	4.649008e-04	0	0
##	[37,]	0.8727611303	0.1236226112	3.616220e-03	0	0
##	[38,]	0.8784143925	0.1181371883	3.448369e-03	0	0
##	[39,]	0.9818881154	0.0178834461	2.284581e-04	0	0
##	[40,]	0.8855464458	0.1111408770	3.312591e-03	0	0
##	[41,]	0.8739260435	0.1224733591	3.600523e-03	0	0
##	[42,]	0.7771291733	0.2113909870	1.147985e-02	0	0
##	[43,]	0.5608592629	0.4086233377	3.051744e-02	0	0
##	[44,]	0.9770054817	0.0227222536	2.722492e-04	0	0
##	[45,]	0.9797149301	0.0200234037	2.617840e-04	0	0
##	[46,]	0.7284307480	0.0707070604	2.008622e-01	0	0
##	[47,]	0.9218583703	0.0764360055	1.705689e-03	0	0
##	[48,]	0.9813195467	0.0184936859	1.868648e-04	0	0
##	[49,]	0.9450667500	0.0540066026	9.266208e-04	0	1
##	[50,]	0.9379547834	0.0609061085	1.139197e-03	0	1
##	[51,]	0.7178564072	0.2677990198	1.434452e-02	0	1
##	[52,]	0.7877600789	0.2036312670	8.608708e-03	0	0
##	[53,]	0.7128617764	0.2719542980	1.518391e-02	0	1
##	[54,]	0.9159579873	0.0822141096	1.827856e-03	0	1
##	[55,]	0.9231283069	0.0751535818	1.718141e-03	0	0

##	[56,]	0.7004110813	0.2838772237	1.571166e-02	0	0
##	[57,]	0.5174217224	0.4441415370	3.843668e-02	0	0
##	[58,]	0.6895155907	0.2942910790	1.619335e-02	0	0
##	[59,]	0.8877695203	0.1092878133	2.942576e-03	0	0
##	[60,]	0.7680356503	0.2208426297	1.112184e-02	0	0
##	[61,]	0.6707134843	0.3106892705	1.859725e-02	0	1
##	[62,]	0.8933489323	0.1037141308	2.936956e-03	0	0
##	[63,]	0.8955112696	0.1017080396	2.780749e-03	0	0
##	[64,]	0.8062500954	0.1860660017	7.683914e-03	0	0
##	[65,]	0.8131658435	0.1803937554	6.440372e-03	0	0
##	[66,]	0.7854526639	0.2054593563	9.087909e-03	0	0
##	[67,]	0.0134917106	0.4995346963	4.869736e-01	1	1
##	[68,]	0.1082914621	0.6546783447	2.370301e-01	1	1
##	[69,]	0.9172002673	0.0808456615	1.954050e-03	0	0
##	[70,]	0.9205455184	0.0776063502	1.848218e-03	0	0
##	[71,]	0.3105429411	0.6064711213	8.298597e-02	1	1
##	[72,]	0.9905241132	0.0094094034	6.648263e-05	0	0
##	[73,]	0.9150035381	0.0829005167	2.095927e-03	0	0
##	[74,]	0.8918336034	0.1052321568	2.934262e-03	0	0
##	[75,]	0.9568092823	0.0424664281	7.243378e-04	0	0
##	[76,]	0.9724660516	0.0272321720	3.017595e-04	0	0
##	[77,]	0.7542886734	0.2351934761	1.051783e-02	0	0
##	[78,]	0.9326379299	0.0659106001	1.451472e-03	0	0
##	[79,]	0.9322429299	0.0663800314	1.377018e-03	0	0
##	[80,]	0.9344555140	0.0641288906	1.415610e-03	0	0
##	[81,]	0.0395554118	0.6230903268	3.373542e-01	1	1
##	[82,]	0.8941878676	0.1029939279	2.818153e-03	0	0
##	[83,]	0.0776628703	0.6403601766	2.819770e-01	1	1
##	[84,]	0.0172510408	0.5067211390	4.760278e-01	1	1
##	[85,]	0.0569696352	0.6828925014	2.601379e-01	1	1
##	[86,]	0.2127043456	0.6674610972	1.198345e-01	1	1
##	[87,]	0.0076813106	0.4082698226	5.840488e-01	2	2
##	[88,]	0.1563583910	0.6970517039	1.465898e-01	1	1
##	[89,]	0.0044179759	0.3272824287	6.682996e-01	2	2
##	[90,]	0.1041436121	0.7075845003	1.882719e-01	1	1
##	[91,]	0.0570549481	0.6604349017	2.825102e-01	1	1
##	[92,]	0.0215886030	0.5448517799	4.335597e-01	1	1
##	[93,]	0.0210175607	0.5429445505	4.360380e-01	1	1
##	[94,]	0.1942517161	0.6737127900	1.320355e-01	1	1
##	[95,]	0.5600466728	0.4083146751	3.163870e-02	0	1
##	[96,]	0.0008235296	0.1717038900	8.274726e-01	2	2
##	[97,]	0.0438419878	0.6651240587	2.910339e-01	1	1
##	[98,]	0.0139578525	0.5034586191	4.825836e-01	1	1
##	[99,]	0.0027661903	0.2825290263	7.147048e-01	2	2
##	[100,]	0.3104296029	0.6062971354	8.327331e-02	1	1
##	[101,]	0.2712594569	0.6313474774	9.739303e-02	1	1
##	[102,]	0.6943967938	0.2809743583	2.462878e-02	0	1
##	[103,]	0.9249962568	0.0733581036	1.645616e-03	0	0
##	[104,]	0.8543217182	0.1413440108	4.334220e-03	0	0
##	[105,]	0.0032827267	0.2888357043	7.078816e-01	2	2
##	[106,]	0.4081716835	0.5356909037	5.613736e-02	1	1
##	[107,]	0.6483498812	0.3308522105	2.079797e-02	0	1
##	[108,]	0.3306984901	0.5882454515	8.105608e-02	1	1
##	[109,]	0.3311069608	0.5931779742	7.571509e-02	1	1

##	[110,]	0.3903041482	0.5390223861	7.067344e-02	1	1
##	[111,]	0.6750972271	0.3000692427	2.483350e-02	0	1
##	[112,]	0.9593193531	0.0398545153	8.261655e-04	0	0
##	[113,]	0.2425684333	0.0544724651	7.029591e-01	2	0
##	[114,]	0.4543336332	0.4990566373	4.660970e-02	1	0
##	[115,]	0.0783828646	0.6830548048	2.385624e-01	1	1
##	[116,]	0.2961102128	0.6192604899	8.462921e-02	1	1
##	[117,]	0.2574200630	0.6341571808	1.084228e-01	1	1
##	[118,]	0.2531803250	0.6345982552	1.122214e-01	1	2
##	[119,]	0.0574655198	0.6721069217	2.704275e-01	1	1
##	[120,]	0.4965067804	0.4643240273	3.916921e-02	0	1
##	[121,]	0.3513494432	0.5750766397	7.357391e-02	1	1
##	[122,]	0.6561113000	0.3241110146	1.977771e-02	0	1
##	[123,]	0.8228051662	0.1698192060	7.375672e-03	0	0
##	[124,]	0.1948990077	0.5957353711	2.093656e-01	1	1
##	[125,]	0.5627265573	0.4068047106	3.046869e-02	0	1
##	[126,]	0.6587932110	0.3210139275	2.019288e-02	0	1
##	[127,]	0.9511050582	0.0480471514	8.477575e-04	0	0
##	[128,]	0.9274008870	0.0710534826	1.545717e-03	0	0
##	[129,]	0.7729493976	0.1875766814	3.947398e-02	0	1
##	[130,]	0.8722642660	0.1118561476	1.587965e-02	0	1
##	[131,]	0.8164380789	0.1754539162	8.108064e-03	0	0
##	[132,]	0.7947955132	0.1929606497	1.224389e-02	0	0
##	[133,]	0.7693715692	0.2192738354	1.135463e-02	0	1
##	[134,]	0.8062524796	0.1854850650	8.262420e-03	0	1
##	[135,]	0.1369756162	0.6966164112	1.664080e-01	1	1
##	[136,]	0.7911012173	0.2001465261	8.752246e-03	0	0
##	[137,]	0.9599187374	0.0392969288	7.843011e-04	0	0
##	[138,]	0.6292279363	0.3482045531	2.256748e-02	0	0
##	[139,]	0.5476765037	0.4192678928	3.305563e-02	0	0
##	[140,]	0.1276173145	0.6919689178	1.804138e-01	1	1
##	[141,]	0.2491356581	0.6413479447	1.095164e-01	1	2
##	[142,]	0.0690345839	0.6849802732	2.459852e-01	1	2
##	[143,]	0.7492858768	0.2392164022	1.149775e-02	0	1
##	[144,]	0.9723735452	0.0266720410	9.543985e-04	0	0
##	[145,]	0.9720439315	0.0269600507	9.959539e-04	0	0
##	[146,]	0.9750681520	0.0242249183	7.069435e-04	0	0
##	[147,]	0.9526293278	0.0406145714	6.756207e-03	0	0
##	[148,]	0.9588639736	0.0370871723	4.048862e-03	0	0
##	[149,]	0.9816261530	0.0180464406	3.273844e-04	0	0
##	[150,]	0.9803420901	0.0194073953	2.504602e-04	0	0
##	[151,]	0.9662324786	0.0327998400	9.677158e-04	0	0
##	[152,]	0.9402308464	0.0585322268	1.236994e-03	0	0
##	[153,]	0.9359071851	0.0627585575	1.334222e-03	0	0
##	[154,]	0.9379706383	0.0606500655	1.379332e-03	0	0
##	[155,]	0.9524025917	0.0467093810	8.879446e-04	0	0
##	[156,]	0.8811470270	0.1156351417	3.217816e-03	0	0
##	[157,]	0.9230270386	0.0749097466	2.063268e-03	0	0
##	[158,]	0.9344092011	0.0643338263	1.257013e-03	0	0
##	[159,]	0.9685822725	0.0309778880	4.399553e-04	0	0
##	[160,]	0.9658945799	0.0336057693	4.995601e-04	0	0
##	[161,]	0.5885510445	0.3835632205	2.788574e-02	0	1
##	[162,]	0.7850771546	0.2059875876	8.935291e-03	0	0
##	[163,]	0.3806165457	0.5567898154	6.259353e-02	1	1

## [164,]	0.9061020017	0.0916813612	2.216539e-03	0	0
## [165,]	0.2736860216	0.6344023347	9.191166e-02	1	1
## [166,]	0.4423771501	0.5095502734	4.807261e-02	1	1
## [167,]	0.4654645324	0.4890915751	4.544392e-02	1	1
## [168,]	0.6388025284	0.3396790326	2.151843e-02	0	0
## [169,]	0.4703872204	0.4848007858	4.481199e-02	1	1
## [170,]	0.9542480707	0.0385880843	7.163884e-03	0	0
## [171,]	0.9816613197	0.0180972405	2.413778e-04	0	0
## [172,]	0.9783202410	0.0212757122	4.039527e-04	0	0
## [173,]	0.9583883286	0.0369117856	4.699990e-03	0	0
## [174,]	0.9688420892	0.0295960344	1.561883e-03	0	0
## [175,]	0.9515292048	0.0398717858	8.598985e-03	0	0
## [176,]	0.9419428706	0.0554237030	2.633410e-03	0	0
## [177,]	0.9523509145	0.0450660624	2.582997e-03	0	0
## [178,]	0.9336117506	0.0503712371	1.601704e-02	0	0
## [179,]	0.8881080747	0.1089265421	2.965281e-03	0	0
## [180,]	0.9469339848	0.0521776639	8.884459e-04	0	0
## [181,]	0.9648203254	0.0328914449	2.288218e-03	0	0
## [182,]	0.9538161755	0.0453722812	8.116139e-04	0	0
## [183,]	0.9615491629	0.0348128080	3.637994e-03	0	0
## [184,]	0.9579678178	0.0371805578	4.851597e-03	0	0
## [185,]	0.8217154741	0.1705056578	7.778932e-03	0	0
## [186,]	0.9832475781	0.0166022498	1.501942e-04	0	0
## [187,]	0.9749541879	0.0247394647	3.063872e-04	0	0
## [188,]	0.9191882014	0.0791290775	1.682756e-03	0	0
## [189,]	0.9528830647	0.0461715162	9.454730e-04	0	0
## [190,]	0.9739241004	0.0256836694	3.921513e-04	0	0
## [191,]	0.9585301280	0.0406418741	8.279314e-04	0	0
## [192,]	0.8956145644	0.0997108370	4.674612e-03	0	0
## [193,]	0.9359872341	0.0612091906	2.803501e-03	0	0
## [194,]	0.9267884493	0.0714884847	1.723050e-03	0	0
## [195,]	0.8378939629	0.1567045748	5.401477e-03	0	0
## [196,]	0.9531692266	0.0460302904	8.004829e-04	0	0
## [197,]	0.9450973868	0.0536471307	1.255398e-03	0	0
## [198,]	0.0035693287	0.3234610856	6.729696e-01	2	1
## [199,]	0.0041426276	0.3420840204	6.537734e-01	2	1
## [200,]	0.0112554226	0.4792753160	5.094693e-01	2	2
## [201,]	0.9826503396	0.0171770696	1.726008e-04	0	0
## [202,]	0.9771147370	0.0226484761	2.367681e-04	0	0
## [203,]	0.6299108863	0.0566168055	3.134722e-01	0	1
## [204,]	0.7143293619	0.1291230172	1.565477e-01	0	1
## [205,]	0.6088713408	0.3666341901	2.449449e-02	0	1
## [206,]	0.8544108272	0.1209344193	2.465479e-02	0	0
## [207,]	0.9209212661	0.0771546140	1.924191e-03	0	0
## [208,]	0.9222449064	0.0748542324	2.900839e-03	0	0
## [209,]	0.9189644456	0.0743245408	6.711023e-03	0	0
## [210,]	0.9168555737	0.0779666528	5.177737e-03	0	0
## [211,]	0.9287972450	0.0697856918	1.417027e-03	0	0
## [212,]	0.9855802655	0.0142985117	1.212876e-04	0	0
## [213,]	0.9798740745	0.0199424829	1.833455e-04	0	0
## [214,]	0.9836018682	0.0158760138	5.220938e-04	0	2
## [215,]	0.9765883684	0.0222877003	1.123861e-03	0	1
## [216,]	0.1557324678	0.3602586091	4.840090e-01	2	2
## [217,]	0.1939822882	0.6691208482	1.368968e-01	1	0

##	[218,]	0.9646835923	0.0346899927	6.263836e-04	0	0
##	[219,]	0.9558851123	0.0433987752	7.161115e-04	0	0
##	[220,]	0.8837315440	0.1130801514	3.188261e-03	0	0
##	[221,]	0.0079333670	0.3958623409	5.962042e-01	2	2
##	[222,]	0.0853441805	0.6785148382	2.361410e-01	1	1
##	[223,]	0.8423204422	0.1519517750	5.727724e-03	0	0
##	[224,]	0.7973516583	0.1927993000	9.849034e-03	0	0
##	[225,]	0.7339369059	0.2532304227	1.283268e-02	0	0
##	[226,]	0.9638109803	0.0355826356	6.063672e-04	0	0
##	[227,]	0.9603165388	0.0390374474	6.460095e-04	0	0
##	[228,]	0.9538837075	0.0453448184	7.714655e-04	0	0
##	[229,]	0.9537646174	0.0452807918	9.546017e-04	0	0
##	[230,]	0.0330543891	0.5972263813	3.697193e-01	1	2
##	[231,]	0.3038798571	0.6078619361	8.825812e-02	1	0
##	[232,]	0.2085096091	0.6525738835	1.389165e-01	1	0
##	[233,]	0.7690078616	0.2217707187	9.221398e-03	0	0
##	[234,]	0.3486313820	0.5814506412	6.991807e-02	1	1
##	[235,]	0.0114221219	0.4378330708	5.507448e-01	2	2
##	[236,]	0.0005387716	0.1502110213	8.492502e-01	2	2
##	[237,]	0.0006521290	0.1616233140	8.377245e-01	2	2
##	[238,]	0.0460305624	0.5280436873	4.259257e-01	1	1
##	[239,]	0.0571052022	0.6532820463	2.896127e-01	1	1
##	[240,]	0.7165890932	0.2701076269	1.330331e-02	0	0
##	[241,]	0.8103058934	0.1826654971	7.028658e-03	0	0
##	[242,]	0.8328922391	0.1614614129	5.646449e-03	0	0
##	[243,]	0.6758541465	0.3046695292	1.947632e-02	0	0
##	[244,]	0.2378475219	0.6558510661	1.063014e-01	1	1
##	[245,]	0.1925064623	0.6814619303	1.260317e-01	1	1
##	[246,]	0.2382312715	0.6544206738	1.073481e-01	1	1
##	[247,]	0.8553224802	0.1382720470	6.405464e-03	0	0
##	[248,]	0.2081159055	0.6754888892	1.163953e-01	1	1
##	[249,]	0.1522830576	0.6944086552	1.533083e-01	1	1
##	[250,]	0.1342680007	0.6771354079	1.885966e-01	1	1
##	[251,]	0.4440669417	0.5069085360	4.902452e-02	1	0
##	[252,]	0.4144240618	0.5334874988	5.208845e-02	1	0
##	[253,]	0.9872286320	0.0125926025	1.788194e-04	0	0
##	[254,]	0.9101063609	0.0879748389	1.918800e-03	0	0
##	[255,]	0.9262342453	0.0723725408	1.393216e-03	0	0
##	[256,]	0.9188773632	0.0794502273	1.672469e-03	0	0
##	[257,]	0.9188777804	0.0794497952	1.672455e-03	0	0
##	[258,]	0.8588094115	0.1368267089	4.363821e-03	0	0
##	[259,]	0.9160832167	0.0821015835	1.815182e-03	0	0
##	[260,]	0.9525581598	0.0467039831	7.378999e-04	0	0
##	[261,]	0.9530189633	0.0462311506	7.498969e-04	0	0
##	[262,]	0.9621387720	0.0373359770	5.251476e-04	0	0
##	[263,]	0.6611268520	0.3204767108	1.839646e-02	0	0
##	[264,]	0.8310544491	0.1629168987	6.028679e-03	0	0
##	[265,]	0.8440115452	0.1507794857	5.209033e-03	0	0
##	[266,]	0.8051986694	0.1874147654	7.386624e-03	0	0
##	[267,]	0.8458270431	0.1492371112	4.935842e-03	0	0
##	[268,]	0.4233784378	0.5237135291	5.290803e-02	1	0
##	[269,]	0.5199383497	0.4425279498	3.753375e-02	0	0
##	[270,]	0.5702331662	0.4005388916	2.922794e-02	0	0
##	[271,]	0.9817674756	0.0180726014	1.599399e-04	0	0

## [272,]	0.9802984595	0.0195008237	2.007961e-04	0	0
## [273,]	0.9917007089	0.0082523981	4.688748e-05	0	0
## [274,]	0.9794893265	0.0203189515	1.917609e-04	0	0
## [275,]	0.9841006994	0.0157555901	1.436804e-04	0	0
## [276,]	0.9334563017	0.0649700016	1.573661e-03	0	0
## [277,]	0.8721490502	0.1238351613	4.015797e-03	0	0
## [278,]	0.8517095447	0.1436740756	4.616483e-03	0	0
## [279,]	0.9741807580	0.0255220737	2.972099e-04	0	0
## [280,]	0.9734717011	0.0262151193	3.131993e-04	0	0
## [281,]	0.0460271910	0.6195605993	3.344122e-01	1	1
## [282,]	0.7206272483	0.2641404569	1.523224e-02	0	0
## [283,]	0.8371862769	0.1569748521	5.838969e-03	0	0
## [284,]	0.9775585532	0.0222222805	2.192482e-04	0	0
## [285,]	0.9841824174	0.0156903211	1.272474e-04	0	0
## [286,]	0.9641914368	0.0351663530	6.422687e-04	0	0
## [287,]	0.9676474333	0.0318761803	4.764326e-04	0	0
## [288,]	0.9770171642	0.0226738527	3.089526e-04	0	0
## [289,]	0.9678555131	0.0315507576	5.937790e-04	0	0
## [290,]	0.9542374611	0.0448122732	9.503272e-04	0	0
## [291,]	0.8746125102	0.1218983606	3.489122e-03	0	0
## [292,]	0.9336633086	0.0485377759	1.779901e-02	0	0
## [293,]	0.9246101379	0.0546087585	2.078102e-02	0	0
## [294,]	0.8913447857	0.0999988616	8.656302e-03	0	0
## [295,]	0.8851772547	0.0636541620	5.116861e-02	0	0
## [296,]	0.9405309558	0.0495826714	9.886400e-03	0	0
## [297,]	0.9386697412	0.0594086386	1.921642e-03	0	0
## [298,]	0.9785314798	0.0212629121	2.055050e-04	0	0
## [299,]	0.9819038510	0.0179103669	1.858041e-04	0	0
## [300,]	0.9849972725	0.0148724616	1.303560e-04	0	0
## [301,]	0.9856615663	0.0142012630	1.371238e-04	0	0
## [302,]	0.9880378246	0.0118704541	9.178293e-05	0	0
## [303,]	0.9877372980	0.0121632991	9.934317e-05	0	0
## [304,]	0.9860855341	0.0137859983	1.285166e-04	0	0
## [305,]	0.9917417765	0.0082052378	5.296062e-05	0	0
## [306,]	0.9735638499	0.0235113036	2.924741e-03	0	0
## [307,]	0.9734964371	0.0262109097	2.926633e-04	0	0
## [308,]	0.9798420668	0.0199618489	1.961470e-04	0	0
## [309,]	0.9853293300	0.0145224743	1.482064e-04	0	0
## [310,]	0.9872763753	0.0126132118	1.104270e-04	0	0
## [311,]	0.9888799191	0.0110387243	8.137888e-05	0	0
## [312,]	0.9858383536	0.0140367774	1.249012e-04	0	0
## [313,]	0.7771399617	0.2136568427	9.203220e-03	0	0
## [314,]	0.9010943174	0.0966051072	2.300559e-03	0	0
## [315,]	0.8931245208	0.1042635888	2.611850e-03	0	0
## [316,]	0.8916625381	0.1057372913	2.600203e-03	0	0
## [317,]	0.9820886254	0.0177233312	1.879627e-04	0	0
## [318,]	0.9719341397	0.0276418775	4.238957e-04	0	0
## [319,]	0.9911184907	0.0088207573	6.077677e-05	0	0
## [320,]	0.9894077778	0.0104699396	1.223205e-04	0	0
## [321,]	0.9647550583	0.0347631425	4.817563e-04	0	0
## [322,]	0.9790823460	0.0203669537	5.506931e-04	0	0
## [323,]	0.9797659516	0.0197935142	4.406166e-04	0	0
## [324,]	0.9521531463	0.0470061079	8.407198e-04	0	0
## [325,]	0.9825948477	0.0172238816	1.811608e-04	0	0

## [326,]	0.9859651327	0.0139149018	1.200054e-04	0	0
## [327,]	0.9892700315	0.0106570721	7.293417e-05	0	0
## [328,]	0.9871205688	0.0127903307	8.905720e-05	0	0
## [329,]	0.9899695516	0.0099616041	6.881019e-05	0	0
## [330,]	0.9908974767	0.0090488493	5.367932e-05	0	0
## [331,]	0.9908974767	0.0090488493	5.367932e-05	0	0
## [332,]	0.9771353006	0.0226232205	2.414561e-04	0	0
## [333,]	0.9892042279	0.0107253976	7.036114e-05	0	0
## [334,]	0.9752619267	0.0244743582	2.637014e-04	0	0
## [335,]	0.9904022217	0.0095388032	5.885570e-05	0	0
## [336,]	0.9891132116	0.0108101675	7.667804e-05	0	0
## [337,]	0.9870170951	0.0128263785	1.564821e-04	0	0
## [338,]	0.9884443879	0.0114317825	1.238883e-04	0	0
## [339,]	0.9774567485	0.0223182961	2.249983e-04	0	0
## [340,]	0.9814192057	0.0184174459	1.633145e-04	0	0
## [341,]	0.9851011038	0.0146448389	2.540300e-04	0	0
## [342,]	0.9871102571	0.0127685769	1.211832e-04	0	0
## [343,]	0.9866762757	0.0132211549	1.025594e-04	0	0
## [344,]	0.9401096702	0.0588508733	1.039427e-03	0	0
## [345,]	0.9860547185	0.0138219669	1.233174e-04	0	0
## [346,]	0.9810258746	0.0187279191	2.461409e-04	0	0
## [347,]	0.9733114243	0.0263718590	3.167768e-04	0	0
## [348,]	0.8040860295	0.1887383610	7.175634e-03	0	0
## [349,]	0.8422815800	0.1517901123	5.928413e-03	0	0
## [350,]	0.9682240486	0.0313683040	4.076906e-04	0	0
## [351,]	0.8953289986	0.1019382104	2.732726e-03	0	0
## [352,]	0.3067314327	0.6104441285	8.282436e-02	1	1
## [353,]	0.9186732173	0.0795629025	1.763988e-03	0	0
## [354,]	0.9161286354	0.0819946378	1.876631e-03	0	0
## [355,]	0.9128189683	0.0852445066	1.936594e-03	0	0
## [356,]	0.1777395457	0.6739836931	1.482767e-01	1	1
## [357,]	0.1928171217	0.6720308661	1.351520e-01	1	1
## [358,]	0.3250002563	0.5953843594	7.961546e-02	1	1
## [359,]	0.3347738087	0.5902849436	7.494128e-02	1	0
## [360,]	0.7125170827	0.2734530270	1.402993e-02	0	0
## [361,]	0.8854898810	0.1114840582	3.026016e-03	0	0
## [362,]	0.7940338850	0.1979331374	8.032991e-03	0	0
## [363,]	0.9691555500	0.0304642469	3.801608e-04	0	0
## [364,]	0.9639075398	0.0356210172	4.714511e-04	0	0
## [365,]	0.9591708183	0.0402333029	5.958396e-04	0	0
## [366,]	0.9888207912	0.0110915108	8.774872e-05	0	0
## [367,]	0.9790730476	0.0206726883	2.541921e-04	0	0
## [368,]	0.9730262160	0.0266255345	3.482308e-04	0	0
## [369,]	0.9801061749	0.0196787305	2.150618e-04	0	0
## [370,]	0.9881161451	0.0117898732	9.393988e-05	0	0
## [371,]	0.9831210375	0.0167185236	1.604218e-04	0	0
## [372,]	0.8838706017	0.1098853424	6.244083e-03	0	0
## [373,]	0.9885023832	0.0114124101	8.523023e-05	0	0
## [374,]	0.9360767603	0.0624524131	1.470844e-03	0	0
## [375,]	0.9815872312	0.0182261784	1.866110e-04	0	0
## [376,]	0.9880712032	0.0118413838	8.741170e-05	0	0
## [377,]	0.9919192791	0.0080312705	4.946622e-05	0	0
## [378,]	0.9894012809	0.0105192978	7.940772e-05	0	0
## [379,]	0.9896994233	0.0102286823	7.192646e-05	0	0

## [380,]	0.9780574441	0.0210136045	9.289050e-04	0	0
## [381,]	0.9810118675	0.0184858479	5.022495e-04	0	0
## [382,]	0.9572082162	0.0421327874	6.589699e-04	0	0
## [383,]	0.9876458049	0.0122117354	1.424728e-04	0	0
## [384,]	0.9211065173	0.0481679328	3.072564e-02	0	0
## [385,]	0.9647287726	0.0301262178	5.144925e-03	0	0
## [386,]	0.9115018249	0.0504490472	3.804911e-02	0	0
## [387,]	0.9799602628	0.0193915684	6.481451e-04	0	0
## [388,]	0.8987456560	0.0533115156	4.794277e-02	0	0
## [389,]	0.9794763923	0.0202470273	2.766050e-04	0	0
## [390,]	0.9731314182	0.0255376305	1.330952e-03	0	0
## [391,]	0.9769849777	0.0223340802	6.809466e-04	0	0
## [392,]	0.9749445319	0.0238991752	1.156340e-03	0	0
## [393,]	0.7616456747	0.0759577602	1.623965e-01	0	1
## [394,]	0.9896574616	0.0102651576	7.742365e-05	0	0
## [395,]	0.9872518778	0.0126365991	1.115137e-04	0	0
## [396,]	0.9817430973	0.0179888066	2.680834e-04	0	0
## [397,]	0.6640340686	0.3169499338	1.901603e-02	0	1
## [398,]	0.9689996839	0.0305431243	4.572023e-04	0	0
## [399,]	0.9803012013	0.0194631331	2.356510e-04	0	0
## [400,]	0.9868202806	0.0130141936	1.655564e-04	0	0
## [401,]	0.9614447355	0.0326035470	5.951697e-03	0	0
## [402,]	0.9739750028	0.0252656862	7.593724e-04	0	0
## [403,]	0.9724158049	0.0270134732	5.707715e-04	0	0
## [404,]	0.9646034241	0.0341346376	1.261849e-03	0	0
## [405,]	0.9564370513	0.0413770899	2.185968e-03	0	0
## [406,]	0.6465496421	0.3323648870	2.108551e-02	0	1
## [407,]	0.7633409500	0.1990752220	3.758382e-02	0	0
## [408,]	0.8172174692	0.0963268057	8.645583e-02	0	0
## [409,]	0.6918190122	0.1226719245	1.855090e-01	0	0
## [410,]	0.8038689494	0.1888708025	7.260252e-03	0	1
## [411,]	0.8486627936	0.1465717852	4.765411e-03	0	1
## [412,]	0.8672853708	0.1287964731	3.918153e-03	0	1
## [413,]	0.9523472786	0.0467946790	8.580858e-04	0	0
## [414,]	0.9444777966	0.0544928126	1.029398e-03	0	0
## [415,]	0.9558525681	0.0434641689	6.831726e-04	0	0
## [416,]	0.9607205391	0.0386781953	6.012268e-04	0	0
## [417,]	0.9555858970	0.0437274054	6.866544e-04	0	0
## [418,]	0.9532271028	0.0459899083	7.830155e-04	0	0
## [419,]	0.9432989955	0.0557150468	9.859913e-04	0	1
## [420,]	0.9620454311	0.0373979025	5.566776e-04	0	0
## [421,]	0.9688377380	0.0307655297	3.967696e-04	0	0
## [422,]	0.9087281823	0.0890795812	2.192265e-03	0	0
## [423,]	0.5354113579	0.4304965734	3.409202e-02	0	0
## [424,]	0.9655990601	0.0339631625	4.377824e-04	0	0
## [425,]	0.3154983222	0.6067154408	7.778621e-02	1	0
## [426,]	0.2945197523	0.6209641099	8.451618e-02	1	1
## [427,]	0.3119665980	0.6091235876	7.890974e-02	1	0
## [428,]	0.2808397412	0.6249173284	9.424297e-02	1	1
## [429,]	0.9700112939	0.0296121389	3.765775e-04	0	0
## [430,]	0.8897927999	0.1074272916	2.779873e-03	0	1
## [431,]	0.9729197025	0.0267592613	3.210838e-04	0	0
## [432,]	0.9403515458	0.0585119501	1.136617e-03	0	0
## [433,]	0.9715666175	0.0280599613	3.734229e-04	0	0

## [434,]	0.9351443052	0.0500157289	1.483998e-02	0	2
## [435,]	0.9523755908	0.0414150469	6.209448e-03	0	2
## [436,]	0.9785044193	0.0212373361	2.582312e-04	0	0
## [437,]	0.9783078432	0.0214486476	2.434628e-04	0	0
## [438,]	0.3675312400	0.5643697977	6.809890e-02	1	0
## [439,]	0.9533199072	0.0459272377	7.529454e-04	0	0
## [440,]	0.9620799422	0.0373828858	5.371795e-04	0	0
## [441,]	0.2348256111	0.6599321961	1.052422e-01	1	0
## [442,]	0.9266759753	0.0718256980	1.498379e-03	0	0
## [443,]	0.9800345898	0.0197530258	2.123581e-04	0	0
## [444,]	0.9596020579	0.0398092754	5.887218e-04	0	0
## [445,]	0.9459308982	0.0532212220	8.479066e-04	0	0
## [446,]	0.9628171325	0.0366960205	4.869230e-04	0	0
## [447,]	0.3520398438	0.5784902573	6.946985e-02	1	0
## [448,]	0.9333617091	0.0653212890	1.317099e-03	0	0
## [449,]	0.1795419753	0.6812945008	1.391635e-01	1	1
## [450,]	0.9037232995	0.0938595012	2.417153e-03	0	0
## [451,]	0.9741482735	0.0255118906	3.397547e-04	0	0
## [452,]	0.4622284174	0.0559126511	4.818590e-01	2	0
## [453,]	0.9938866496	0.0060868389	2.654716e-05	0	0
## [454,]	0.9810350537	0.0187308006	2.341455e-04	0	0
## [455,]	0.9763991237	0.0232415944	3.593172e-04	0	0
## [456,]	0.9734852314	0.0256763920	8.383428e-04	0	0
## [457,]	0.9836624861	0.0161864404	1.509872e-04	0	0
## [458,]	0.9695993662	0.0273592789	3.041342e-03	0	0
## [459,]	0.9527195692	0.0464352071	8.452085e-04	0	0
## [460,]	0.7622783780	0.2230254561	1.469613e-02	0	0
## [461,]	0.7621524334	0.2259981334	1.184938e-02	0	0
## [462,]	0.4789621234	0.1184802651	4.025575e-01	0	0
## [463,]	0.7758741975	0.1343292594	8.979662e-02	0	0
## [464,]	0.7894559503	0.1392328888	7.131115e-02	0	0
## [465,]	0.6180652380	0.3070237339	7.491108e-02	0	0
## [466,]	0.8800941706	0.1140065789	5.899253e-03	0	0
## [467,]	0.8431900740	0.1498630047	6.946834e-03	0	0
## [468,]	0.8836072087	0.1089698598	7.422868e-03	0	0
## [469,]	0.8840211034	0.1104521751	5.526734e-03	0	0
## [470,]	0.9056532979	0.0873048306	7.041903e-03	0	0
## [471,]	0.9166291952	0.0642222762	1.914851e-02	0	0
## [472,]	0.9035980105	0.0841097310	1.229232e-02	0	0
## [473,]	0.8906469345	0.0862889066	2.306420e-02	0	0
## [474,]	0.9208933115	0.0710631236	8.043534e-03	0	0
## [475,]	0.5553259850	0.0990414619	3.456325e-01	0	0
## [476,]	0.4929008186	0.0910530090	4.160462e-01	0	0
## [477,]	0.2040238231	0.0549994968	7.409767e-01	2	0
## [478,]	0.4326508343	0.5146750212	5.267417e-02	1	0
## [479,]	0.6275753975	0.2871097326	8.531481e-02	0	0
## [480,]	0.6290859580	0.3323121667	3.860195e-02	0	0
## [481,]	0.6050542593	0.3463834524	4.856228e-02	0	0
## [482,]	0.4419819117	0.5049563646	5.306176e-02	1	0
## [483,]	0.6643827558	0.2270205170	1.085967e-01	0	0
## [484,]	0.8975471258	0.0807352290	2.171773e-02	0	0
## [485,]	0.9021499753	0.0797377974	1.811227e-02	0	0
## [486,]	0.8535066247	0.1410401165	5.453229e-03	0	0
## [487,]	0.8324278593	0.1063870862	6.118505e-02	0	0

## [488,]	0.8712507486	0.1130420193	1.570728e-02	0	0
## [489,]	0.8004267216	0.1879201382	1.165311e-02	0	0
## [490,]	0.7973279953	0.1907046586	1.196735e-02	0	0
## [491,]	0.8829005957	0.0995360911	1.756330e-02	0	0
## [492,]	0.2010384053	0.0929166675	7.060449e-01	2	2
## [493,]	0.0175644122	0.0081584519	9.742771e-01	2	2
## [494,]	0.0308824461	0.0138977161	9.552199e-01	2	2
## [495,]	0.1046171635	0.0463618636	8.490210e-01	2	2
## [496,]	0.1045649871	0.0508708954	8.445641e-01	2	2
## [497,]	0.0556089208	0.0243595280	9.200316e-01	2	2
## [498,]	0.7289782166	0.2042437345	6.677812e-02	0	0
## [499,]	0.2500697374	0.1361385286	6.137917e-01	2	2
## [500,]	0.2430831641	0.2050447911	5.518721e-01	2	2
## [501,]	0.2778272033	0.2381070256	4.840659e-01	2	2
## [502,]	0.2255068123	0.2264836878	5.480096e-01	2	2
## [503,]	0.4790186882	0.2231884301	2.977929e-01	0	2
## [504,]	0.2602557838	0.1931815892	5.465626e-01	2	2
## [505,]	0.7610142827	0.1969710290	4.201470e-02	0	0
## [506,]	0.8129884005	0.1699705124	1.704113e-02	0	0
## [507,]	0.8538413644	0.1378550977	8.303625e-03	0	0
## [508,]	0.8645729423	0.1250845641	1.034252e-02	0	0
## [509,]	0.8427264690	0.1457454264	1.152810e-02	0	0
## [510,]	0.8444289565	0.1350315958	2.053945e-02	0	0
## [511,]	0.4120114446	0.1739179343	4.140706e-01	2	2
## [512,]	0.8371206522	0.1568568051	6.022479e-03	0	0
## [513,]	0.8313499689	0.1594860554	9.163999e-03	0	0
## [514,]	0.5927788615	0.3796333373	2.758781e-02	0	0
## [515,]	0.5534784794	0.4137973189	3.272428e-02	0	0
## [516,]	0.6450269818	0.3338295519	2.114346e-02	0	0
## [517,]	0.9245977402	0.0730102584	2.392021e-03	0	0
## [518,]	0.9264212251	0.0582351722	1.534355e-02	0	0
## [519,]	0.8157415390	0.1724179089	1.184054e-02	0	0
## [520,]	0.7595057487	0.2141412199	2.635309e-02	0	0
## [521,]	0.7880037427	0.1919955015	2.000080e-02	0	0
## [522,]	0.7855333090	0.1946736723	1.979299e-02	0	0
## [523,]	0.8975788951	0.0989110023	3.510149e-03	0	0
## [524,]	0.9004632235	0.0959025174	3.634347e-03	0	0
## [525,]	0.9002404809	0.0967444330	3.015028e-03	0	0
## [526,]	0.8953858614	0.1015923321	3.021785e-03	0	0
## [527,]	0.8985035419	0.0986412913	2.855175e-03	0	0
## [528,]	0.9037208557	0.0935895145	2.689628e-03	0	0
## [529,]	0.9029889107	0.0943405628	2.670544e-03	0	0
## [530,]	0.9088309407	0.0885903239	2.578714e-03	0	0
## [531,]	0.9213582277	0.0755329579	3.108905e-03	0	0
## [532,]	0.9196182489	0.0771980137	3.183673e-03	0	0
## [533,]	0.9048270583	0.0810779780	1.409504e-02	0	0
## [534,]	0.9012070298	0.0903823078	8.410610e-03	0	0
## [535,]	0.9119506478	0.0818662867	6.183072e-03	0	0
## [536,]	0.1749362946	0.0581424385	7.669213e-01	2	2
## [537,]	0.4596612453	0.1194793582	4.208595e-01	0	2
## [538,]	0.8606922626	0.0943569019	4.495087e-02	0	0
## [539,]	0.8961908221	0.0869132429	1.689592e-02	0	0
## [540,]	0.9256123304	0.0608753711	1.351232e-02	0	0
## [541,]	0.4140549898	0.1032868698	4.826581e-01	2	2

##	[542,]	0.0020370467	0.0007870678	9.971759e-01	2	2
##	[543,]	0.0018978028	0.0007262291	9.973760e-01	2	2
##	[544,]	0.0022023763	0.0008600415	9.969376e-01	2	2
##	[545,]	0.0045491289	0.0019613209	9.934895e-01	2	2
##	[546,]	0.8392438293	0.1410798430	1.967642e-02	0	0
##	[547,]	0.8517953157	0.1328318715	1.537282e-02	0	0
##	[548,]	0.8458606601	0.1326509565	2.148840e-02	0	0
##	[549,]	0.6049290299	0.3195987940	7.547227e-02	0	0
##	[550,]	0.6650802493	0.3021418452	3.277786e-02	0	0
##	[551,]	0.7052168846	0.2689708769	2.581215e-02	0	0
##	[552,]	0.6100927591	0.3604775667	2.942969e-02	0	0
##	[553,]	0.5274074078	0.1903890520	2.822035e-01	0	2
##	[554,]	0.5105331540	0.1709702611	3.184966e-01	0	2
##	[555,]	0.2712260783	0.0947510228	6.340230e-01	2	2
##	[556,]	0.1896995306	0.0636815056	7.466190e-01	2	2
##	[557,]	0.0165127032	0.0077625997	9.757248e-01	2	2
##	[558,]	0.1278999895	0.0471983999	8.249016e-01	2	2
##	[559,]	0.1287196428	0.0509047732	8.203756e-01	2	2
##	[560,]	0.8934231997	0.1030494869	3.527310e-03	0	0
##	[561,]	0.9037051797	0.0930127800	3.281972e-03	0	0
##	[562,]	0.8264400959	0.1666387171	6.921163e-03	0	0
##	[563,]	0.8262422085	0.1669384241	6.819330e-03	0	0
##	[564,]	0.8181000948	0.1745034307	7.396432e-03	0	0
##	[565,]	0.7948707342	0.1957011819	9.428014e-03	0	0
##	[566,]	0.8017389178	0.1894516200	8.809436e-03	0	0
##	[567,]	0.8035062551	0.1878820211	8.611702e-03	0	0
##	[568,]	0.7416101694	0.2452178299	1.317197e-02	0	0
##	[569,]	0.8007892966	0.1905423403	8.668396e-03	0	0
##	[570,]	0.8379629254	0.1553392857	6.697817e-03	0	0
##	[571,]	0.5704523325	0.3318295479	9.771813e-02	0	0
##	[572,]	0.5640486479	0.3559537828	7.999755e-02	0	0
##	[573,]	0.5977881551	0.3349630535	6.724883e-02	0	0
##	[574,]	0.6794841290	0.2497687042	7.074717e-02	0	0
##	[575,]	0.6153344512	0.3315961063	5.306942e-02	0	0
##	[576,]	0.5061457157	0.4323036671	6.155065e-02	0	0
##	[577,]	0.4787628055	0.4566763937	6.456079e-02	0	0
##	[578,]	0.4991457760	0.4273725152	7.348168e-02	0	0
##	[579,]	0.5240636468	0.4081761837	6.776011e-02	0	0
##	[580,]	0.5188363194	0.4138360620	6.732759e-02	0	0
##	[581,]	0.4929523170	0.4315854907	7.546216e-02	0	0
##	[582,]	0.3902724385	0.4439297318	1.657979e-01	1	2
##	[583,]	0.6868788600	0.2642173767	4.890370e-02	0	0
##	[584,]	0.6535431743	0.2870075405	5.944933e-02	0	0
##	[585,]	0.0685925931	0.5991116762	3.322957e-01	1	0
##	[586,]	0.0233686529	0.5327597857	4.438715e-01	1	0
##	[587,]	0.0290744733	0.5259533525	4.449721e-01	1	0
##	[588,]	0.0063849604	0.3593466282	6.342684e-01	2	0
##	[589,]	0.0179701522	0.4612400532	5.207898e-01	2	0
##	[590,]	0.5072236657	0.4492376149	4.353875e-02	0	0
##	[591,]	0.4270722270	0.5134127736	5.951496e-02	1	0
##	[592,]	0.4005989432	0.5340899229	6.531108e-02	1	0
##	[593,]	0.1248917207	0.6748950481	2.002132e-01	1	1
##	[594,]	0.0035326986	0.3072012663	6.892661e-01	2	0
##	[595,]	0.0300139654	0.5775712729	3.924148e-01	1	0

```
## [596,] 0.1038097069 0.6931558251 2.030345e-01 1 0
## [597,] 0.2015876174 0.6645900607 1.338223e-01 1 0
## [598,] 0.5262967944 0.4341621995 3.954101e-02 0 0
## [599,] 0.4753321707 0.4729607403 5.170702e-02 0 0
## [600,] 0.5956926942 0.3760991693 2.820823e-02 0 0
## [601,] 0.0276037101 0.5889584422 3.834378e-01 1 0
## [602,] 0.2519024312 0.6407607794 1.073368e-01 1 0
## [603,] 0.2606245577 0.6350602508 1.043151e-01 1 1
```

```
# Fine-tune model
```