

Part 1 & 2 - Dimentionality Reduction and Feature Selection

Ed

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```
# impoting our libraries
library(caret)
```

```
## Loading required package: ggplot2
```

```
## Loading required package: lattice
```

```
# loading our dataset
data <- read.csv("http://bit.ly/CarreFourDataset")
head(data)
```

```
## Invoice.ID Branch Customer.type Gender Product.line Unit.price
## 1 750-67-8428 A Member Female Health and beauty 74.69
## 2 226-31-3081 C Normal Female Electronic accessories 15.28
## 3 631-41-3108 A Normal Male Home and lifestyle 46.33
## 4 123-19-1176 A Member Male Health and beauty 58.22
## 5 373-73-7910 A Normal Male Sports and travel 86.31
## 6 699-14-3026 C Normal Male Electronic accessories 85.39
## Quantity Tax Date Time Payment cogs gross.margin.percentage
## 1 7 26.1415 1/5/2019 13:08 Ewallet 522.83 4.761905
## 2 5 3.8200 3/8/2019 10:29 Cash 76.40 4.761905
## 3 7 16.2155 3/3/2019 13:23 Credit card 324.31 4.761905
## 4 8 23.2880 1/27/2019 20:33 Ewallet 465.76 4.761905
## 5 7 30.2085 2/8/2019 10:37 Ewallet 604.17 4.761905
## 6 7 29.8865 3/25/2019 18:30 Ewallet 597.73 4.761905
## gross.income Rating Total
## 1 26.1415 9.1 548.9715
## 2 3.8200 9.6 80.2200
## 3 16.2155 7.4 340.5255
## 4 23.2880 8.4 489.0480
## 5 30.2085 5.3 634.3785
## 6 29.8865 4.1 627.6165
```

```
# checking our dataset
dim(data)
```

```
## [1] 1000 16
```

Our dataset has 1000 records and 16 variables

```
# getting info on our dataset
str(data)
```

```
## 'data.frame':    1000 obs. of  16 variables:
## $ Invoice.ID      : chr  "750-67-8428" "226-31-3081" "631-41-3108" "123-19-1176" ...
## $ Branch         : chr  "A" "C" "A" "A" ...
## $ Customer.type  : chr  "Member" "Normal" "Normal" "Member" ...
## $ Gender         : chr  "Female" "Female" "Male" "Male" ...
## $ Product.line   : chr  "Health and beauty" "Electronic accessories" "Home and lifestyle" ...
## $ Unit.price     : num  74.7 15.3 46.3 58.2 86.3 ...
## $ Quantity       : int  7 5 7 8 7 7 6 10 2 3 ...
## $ Tax            : num  26.14 3.82 16.22 23.29 30.21 ...
## $ Date           : chr  "1/5/2019" "3/8/2019" "3/3/2019" "1/27/2019" ...
## $ Time           : chr  "13:08" "10:29" "13:23" "20:33" ...
## $ Payment        : chr  "Ewallet" "Cash" "Credit card" "Ewallet" ...
## $ cogs           : num  522.8 76.4 324.3 465.8 604.2 ...
## $ gross.margin.percentage: num  4.76 4.76 4.76 4.76 4.76 ...
## $ gross.income   : num  26.14 3.82 16.22 23.29 30.21 ...
## $ Rating         : num  9.1 9.6 7.4 8.4 5.3 4.1 5.8 8 7.2 5.9 ...
## $ Total          : num  549 80.2 340.5 489 634.4 ...
```

```
# checking for missing values
colSums(is.na(data))
```

```
##      Invoice.ID      Branch      Customer.type
##      0            0            0
##      Gender      Product.line      Unit.price
##      0            0            0
##      Quantity      Tax            Date
##      0            0            0
##      Time      Payment      cogs
##      0            0            0
## gross.margin.percentage gross.income      Rating
##      0            0            0
##      Total
##      0
```

We have no missing values

Dimensionality Reduction

```
# Creating a new dataframe which specifies which features to be used
data_use <- data[, c(2:8, 11, 12, 14, 15, 16)]
head(data_use)
```

```
##      Branch Customer.type Gender      Product.line Unit.price Quantity
## 1      A      Member Female      Health and beauty      74.69      7
## 2      C      Normal Female Electronic accessories      15.28      5
## 3      A      Normal   Male      Home and lifestyle      46.33      7
```

```
## 4      A      Member   Male      Health and beauty      58.22      8
## 5      A      Normal   Male      Sports and travel      86.31      7
## 6      C      Normal   Male      Electronic accessories  85.39      7
##      Tax      Payment   cogs gross.income Rating      Total
## 1 26.1415      Ewallet 522.83      26.1415      9.1 548.9715
## 2  3.8200      Cash  76.40      3.8200      9.6  80.2200
## 3 16.2155 Credit card 324.31      16.2155      7.4 340.5255
## 4 23.2880      Ewallet 465.76      23.2880      8.4 489.0480
## 5 30.2085      Ewallet 604.17      30.2085      5.3 634.3785
## 6 29.8865      Ewallet 597.73      29.8865      4.1 627.6165
```

```
# unique columns
unique(data_use$Payment)
```

```
## [1] "Ewallet"      "Cash"         "Credit card"
```

```
library(superml)
```

```
## Loading required package: R6
```

```
library(dplyr)
```

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##      filter, lag

## The following objects are masked from 'package:base':
##
##      intersect, setdiff, setequal, union
```

```
# label encoding
lbl <- LabelEncoder$new()
data_new <- data_use %>%
mutate(`Customer.type` = factor(lbl$fit_transform(.$`Customer.type`)),
Gender = factor(lbl$fit_transform(.$Gender)),
`Product.line` = factor(lbl$fit_transform(.$`Product.line`)),
Payment = factor(lbl$fit_transform(.$Payment)))
```

```
# previewing our new dataset
head(data_new)
```

```
##      Branch Customer.type Gender Product.line Unit.price Quantity      Tax Payment
## 1      A              0      0              0      74.69          7 26.1415      0
## 2      C              1      0              1      15.28          5  3.8200      1
## 3      A              1      1              2      46.33          7 16.2155      2
## 4      A              0      1              0      58.22          8 23.2880      0
## 5      A              1      1              3      86.31          7 30.2085      0
```

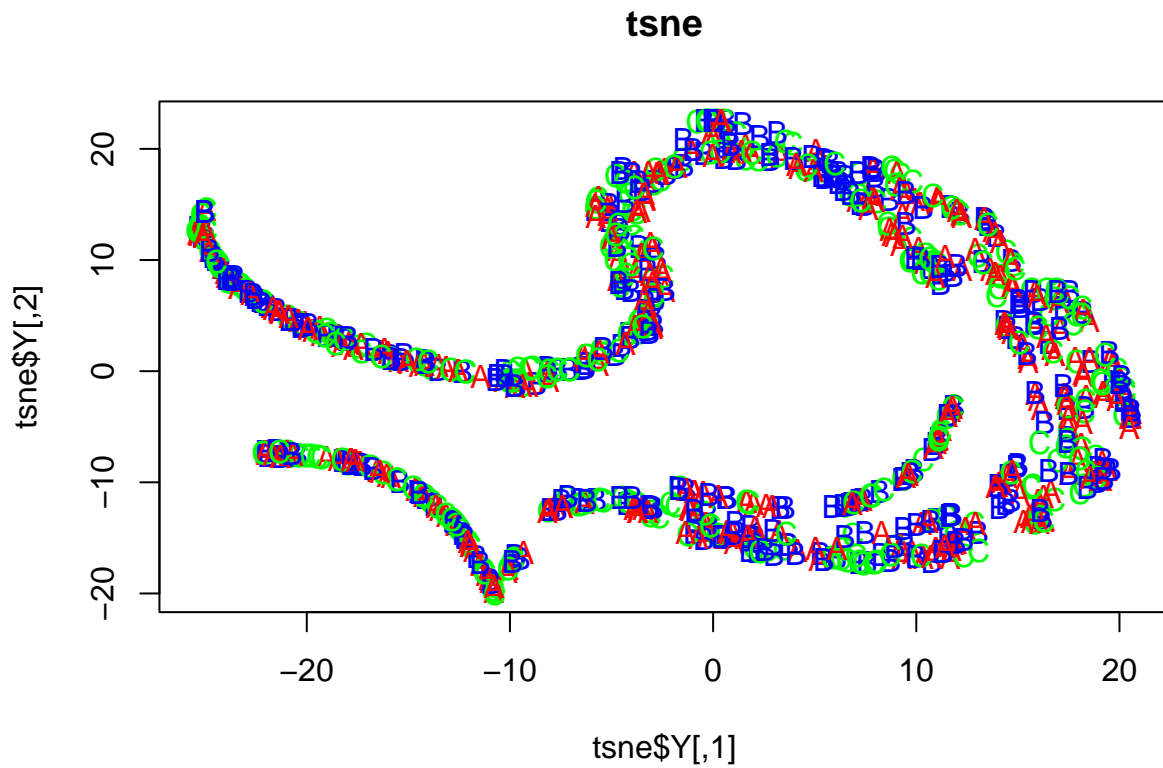
```
## 6      C      1      1      1      85.39      7 29.8865      0
##      cogs gross.income Rating      Total
## 1 522.83      26.1415      9.1 548.9715
## 2  76.40       3.8200      9.6  80.2200
## 3 324.31      16.2155      7.4 340.5255
## 4 465.76      23.2880      8.4 489.0480
## 5 604.17      30.2085      5.3 634.3785
## 6 597.73      29.8865      4.1 627.6165
```

```
# library
library(Rtsne)
# performing our algorithm
tsne <- Rtsne(data_new,dims = 2, perplexity=30, verbose=TRUE, max_iter = 500)
```

```
## Performing PCA
## Read the 1000 x 19 data matrix successfully!
## OpenMP is working. 1 threads.
## Using no_dims = 2, perplexity = 30.000000, and theta = 0.500000
## Computing input similarities...
## Building tree...
## Done in 0.33 seconds (sparsity = 0.101260)!
## Learning embedding...
## Iteration 50: error is 59.352142 (50 iterations in 0.16 seconds)
## Iteration 100: error is 51.637266 (50 iterations in 0.12 seconds)
## Iteration 150: error is 50.413139 (50 iterations in 0.11 seconds)
## Iteration 200: error is 49.954139 (50 iterations in 0.12 seconds)
## Iteration 250: error is 49.667156 (50 iterations in 0.11 seconds)
## Iteration 300: error is 0.562367 (50 iterations in 0.13 seconds)
## Iteration 350: error is 0.394178 (50 iterations in 0.12 seconds)
## Iteration 400: error is 0.356956 (50 iterations in 0.11 seconds)
## Iteration 450: error is 0.346583 (50 iterations in 0.18 seconds)
## Iteration 500: error is 0.340761 (50 iterations in 0.12 seconds)
## Fitting performed in 1.28 seconds.
```

```
# Assigning colours to our branch column
colors = rainbow(length(unique(data$Branch)))
names(colors) = unique(data$Branch)
```

```
# plotting graph
plot(tsne$Y, t='n', main="tsne")
text(tsne$Y, labels=data_new$Branch, col=colors[data_new$Branch])
```



Feature Selection

```
feature<- data_new
feature
```

##	Branch	Customer.type	Gender	Product.line	Unit.price	Quantity	Tax
## 1	A	0	0	0	74.69	7	26.1415
## 2	C	1	0	1	15.28	5	3.8200
## 3	A	1	1	2	46.33	7	16.2155
## 4	A	0	1	0	58.22	8	23.2880
## 5	A	1	1	3	86.31	7	30.2085
## 6	C	1	1	1	85.39	7	29.8865
## 7	A	0	0	1	68.84	6	20.6520
## 8	C	1	0	2	73.56	10	36.7800
## 9	A	0	0	0	36.26	2	3.6260
## 10	B	0	0	4	54.84	3	8.2260
## 11	B	0	0	5	14.48	4	2.8960
## 12	B	0	1	1	25.51	4	5.1020
## 13	A	1	0	1	46.95	5	11.7375
## 14	A	1	1	4	43.19	10	21.5950
## 15	A	1	0	0	71.38	10	35.6900
## 16	B	0	0	3	93.72	6	28.1160
## 17	A	0	0	0	68.93	7	24.1255

## 18	A	1	1	3	72.61	6 21.7830
## 19	A	1	1	4	54.67	3 8.2005
## 20	B	1	0	2	40.30	2 4.0300
## 21	C	0	1	1	86.04	5 21.5100
## 22	B	1	1	0	87.98	3 13.1970
## 23	B	1	1	2	33.20	2 3.3200
## 24	A	1	1	1	34.56	5 8.6400
## 25	A	0	1	3	88.63	3 13.2945
## 26	A	0	0	2	52.59	8 21.0360
## 27	B	1	1	5	33.52	1 1.6760
## 28	A	1	0	5	87.67	2 8.7670
## 29	B	1	0	4	88.36	5 22.0900
## 30	A	1	1	0	24.89	9 11.2005
## 31	B	1	1	5	94.13	5 23.5325
## 32	B	0	1	3	78.07	9 35.1315
## 33	B	1	1	3	83.78	8 33.5120
## 34	A	1	1	0	96.58	2 9.6580
## 35	C	0	0	4	99.42	4 19.8840
## 36	C	0	0	3	68.12	1 3.4060
## 37	A	0	1	3	62.62	5 15.6550
## 38	A	1	0	1	60.88	9 27.3960
## 39	C	1	0	0	54.92	8 21.9680
## 40	B	0	1	2	30.12	8 12.0480
## 41	B	0	0	2	86.72	1 4.3360
## 42	C	0	1	2	56.11	2 5.6110
## 43	B	0	0	3	69.12	6 20.7360
## 44	C	0	0	4	98.70	8 39.4800
## 45	C	0	1	0	15.37	2 1.5370
## 46	B	0	0	1	93.96	4 18.7920
## 47	B	0	1	0	56.69	9 25.5105
## 48	B	0	0	4	20.01	9 9.0045
## 49	B	0	1	1	18.93	6 5.6790
## 50	C	0	0	5	82.63	10 41.3150
## 51	C	0	1	4	91.40	7 31.9900
## 52	A	0	0	4	44.59	5 11.1475
## 53	B	0	0	5	17.87	4 3.5740
## 54	C	0	1	5	15.43	1 0.7715
## 55	B	1	1	2	16.16	2 1.6160
## 56	C	1	0	1	85.98	8 34.3920
## 57	A	0	1	2	44.34	2 4.4340
## 58	A	1	1	0	89.60	8 35.8400
## 59	A	0	0	2	72.35	10 36.1750
## 60	C	1	1	1	30.61	6 9.1830
## 61	C	0	0	3	24.74	3 3.7110
## 62	C	1	1	2	55.73	6 16.7190
## 63	B	0	0	3	55.07	9 24.7815
## 64	A	0	1	3	15.81	10 7.9050
## 65	B	0	1	0	75.74	4 15.1480
## 66	A	0	1	0	15.87	10 7.9350
## 67	C	1	0	0	33.47	2 3.3470
## 68	B	0	0	5	97.61	6 29.2830
## 69	A	1	1	3	78.77	10 39.3850
## 70	A	0	0	0	18.33	1 0.9165
## 71	C	1	1	4	89.48	10 44.7400

## 72	C	1	1	5	62.12	10 31.0600
## 73	B	0	0	4	48.52	3 7.2780
## 74	C	1	0	1	75.91	6 22.7730
## 75	A	1	1	2	74.67	9 33.6015
## 76	C	1	0	1	41.65	10 20.8250
## 77	C	0	1	5	49.04	9 22.0680
## 78	A	0	0	5	20.01	9 9.0045
## 79	C	0	0	4	78.31	10 39.1550
## 80	C	1	0	0	20.38	5 5.0950
## 81	C	1	0	0	99.19	6 29.7570
## 82	B	1	0	4	96.68	3 14.5020
## 83	C	1	1	4	19.25	8 7.7000
## 84	C	0	0	4	80.36	4 16.0720
## 85	C	0	1	3	48.91	5 12.2275
## 86	C	1	0	3	83.06	7 29.0710
## 87	C	1	1	5	76.52	5 19.1300
## 88	A	0	1	4	49.38	7 17.2830
## 89	A	1	1	3	42.47	1 2.1235
## 90	B	1	0	0	76.99	6 23.0970
## 91	C	0	0	2	47.38	4 9.4760
## 92	C	1	0	3	44.86	10 22.4300
## 93	A	0	0	3	21.98	7 7.6930
## 94	B	0	1	0	64.36	9 28.9620
## 95	C	1	1	0	89.75	1 4.4875
## 96	A	1	1	1	97.16	1 4.8580
## 97	B	1	1	0	87.87	10 43.9350
## 98	C	1	0	1	12.45	6 3.7350
## 99	A	1	1	4	52.75	3 7.9125
## 100	B	1	1	2	82.70	6 24.8100
## 101	C	0	1	5	48.71	1 2.4355
## 102	C	1	1	5	78.55	9 35.3475
## 103	C	1	0	1	23.07	9 10.3815
## 104	A	1	1	4	58.26	6 17.4780
## 105	B	1	1	0	30.35	7 10.6225
## 106	A	0	1	1	88.67	10 44.3350
## 107	C	1	1	5	27.38	6 8.2140
## 108	A	1	1	3	62.13	6 18.6390
## 109	C	1	0	4	33.98	9 15.2910
## 110	C	0	1	1	81.97	10 40.9850
## 111	B	0	0	3	16.49	2 1.6490
## 112	C	0	0	0	98.21	3 14.7315
## 113	B	1	0	5	72.84	7 25.4940
## 114	A	0	1	2	58.07	9 26.1315
## 115	C	0	0	2	80.79	9 36.3555
## 116	C	1	0	5	27.02	3 4.0530
## 117	B	0	1	5	21.94	5 5.4850
## 118	B	0	1	5	51.36	1 2.5680
## 119	A	1	0	4	10.96	10 5.4800
## 120	B	1	1	2	53.44	2 5.3440
## 121	A	1	0	1	99.56	8 39.8240
## 122	C	0	1	3	57.12	7 19.9920
## 123	B	0	1	3	99.96	9 44.9820
## 124	C	0	1	2	63.91	8 25.5640
## 125	B	0	0	5	56.47	8 22.5880

## 126	A	1	0	2	93.69	7 32.7915
## 127	A	1	0	3	32.25	5 8.0625
## 128	C	1	0	5	31.73	9 14.2785
## 129	C	0	0	4	68.54	8 27.4160
## 130	B	1	0	3	90.28	9 40.6260
## 131	B	1	0	5	39.62	7 13.8670
## 132	A	0	0	3	92.13	6 27.6390
## 133	B	1	0	3	34.84	4 6.9680
## 134	B	0	1	1	87.45	6 26.2350
## 135	C	1	0	0	81.30	6 24.3900
## 136	C	1	1	5	90.22	3 13.5330
## 137	A	1	0	1	26.31	5 6.5775
## 138	A	0	0	2	34.42	6 10.3260
## 139	B	1	1	3	51.91	10 25.9550
## 140	A	1	1	3	72.50	8 29.0000
## 141	C	0	0	3	89.80	10 44.9000
## 142	C	0	1	0	90.50	10 45.2500
## 143	C	0	0	0	68.60	10 34.3000
## 144	C	0	0	4	30.41	1 1.5205
## 145	A	1	0	2	77.95	6 23.3850
## 146	C	1	0	0	46.26	6 13.8780
## 147	A	0	0	5	30.14	10 15.0700
## 148	C	1	1	0	66.14	4 13.2280
## 149	B	0	1	2	71.86	8 28.7440
## 150	A	1	1	0	32.46	8 12.9840
## 151	B	0	0	5	91.54	4 18.3080
## 152	C	0	1	3	34.56	7 12.0960
## 153	A	1	1	5	83.24	9 37.4580
## 154	C	1	0	4	16.48	6 4.9440
## 155	C	1	0	3	80.97	8 32.3880
## 156	A	0	1	4	92.29	5 23.0725
## 157	B	0	1	1	72.17	1 3.6085
## 158	B	1	1	2	50.28	5 12.5700
## 159	B	0	1	0	97.22	9 43.7490
## 160	B	1	1	3	93.39	6 28.0170
## 161	C	1	0	4	43.18	8 17.2720
## 162	A	1	1	3	63.69	1 3.1845
## 163	A	1	1	4	45.79	7 16.0265
## 164	C	1	1	3	76.40	2 7.6400
## 165	B	1	1	4	39.90	10 19.9500
## 166	B	0	1	0	42.57	8 17.0280
## 167	C	1	1	2	95.58	10 47.7900
## 168	A	1	1	5	98.98	10 49.4900
## 169	A	1	1	4	51.28	6 15.3840
## 170	A	0	1	3	69.52	7 24.3320
## 171	A	1	1	0	70.01	5 17.5025
## 172	B	0	1	4	80.05	5 20.0125
## 173	C	1	1	1	20.85	8 8.3400
## 174	B	0	1	1	52.89	6 15.8670
## 175	B	1	1	4	19.79	8 7.9160
## 176	A	0	1	2	33.84	9 15.2280
## 177	A	0	1	4	22.17	8 8.8680
## 178	C	1	0	5	22.51	7 7.8785
## 179	A	1	1	4	73.88	6 22.1640

## 180	C	0	1	0	86.80	3 13.0200
## 181	C	1	1	5	64.26	7 22.4910
## 182	C	0	1	4	38.47	8 15.3880
## 183	A	0	1	3	15.50	10 7.7500
## 184	C	1	1	0	34.31	8 13.7240
## 185	A	1	0	3	12.34	7 4.3190
## 186	B	0	1	4	18.08	3 2.7120
## 187	B	0	0	2	94.49	8 37.7960
## 188	B	0	1	2	46.47	4 9.2940
## 189	A	1	1	2	74.07	1 3.7035
## 190	C	1	0	2	69.81	4 13.9620
## 191	B	1	0	2	77.04	3 11.5560
## 192	B	1	0	5	73.52	2 7.3520
## 193	C	1	0	4	87.80	9 39.5100
## 194	B	1	1	2	25.55	4 5.1100
## 195	A	1	1	1	32.71	5 8.1775
## 196	C	0	0	5	74.29	1 3.7145
## 197	C	0	1	0	43.70	2 4.3700
## 198	A	1	0	2	25.29	1 1.2645
## 199	C	1	1	0	41.50	4 8.3000
## 200	C	0	0	4	71.39	5 17.8475
## 201	C	0	0	3	19.15	6 5.7450
## 202	B	0	0	1	57.49	4 11.4980
## 203	C	1	1	1	61.41	7 21.4935
## 204	B	0	1	0	25.90	10 12.9500
## 205	B	0	1	2	17.77	5 4.4425
## 206	A	1	0	0	23.03	9 10.3635
## 207	C	0	0	1	66.65	9 29.9925
## 208	C	0	0	2	28.53	10 14.2650
## 209	B	1	0	5	30.37	3 4.5555
## 210	B	1	0	1	99.73	9 44.8785
## 211	A	1	1	1	26.23	9 11.8035
## 212	C	1	0	4	93.26	9 41.9670
## 213	B	1	1	2	92.36	5 23.0900
## 214	B	1	1	3	46.42	3 6.9630
## 215	B	0	0	3	29.61	7 10.3635
## 216	A	1	1	2	18.28	1 0.9140
## 217	B	1	0	3	24.77	5 6.1925
## 218	A	0	0	1	94.64	3 14.1960
## 219	B	1	1	5	94.87	8 37.9480
## 220	B	1	0	4	57.34	3 8.6010
## 221	B	1	1	1	45.35	6 13.6050
## 222	B	1	1	4	62.08	7 21.7280
## 223	C	1	1	1	11.81	5 2.9525
## 224	C	0	0	5	12.54	1 0.6270
## 225	A	1	1	4	43.25	2 4.3250
## 226	C	0	0	3	87.16	2 8.7160
## 227	B	0	1	0	69.37	9 31.2165
## 228	C	0	1	1	37.06	4 7.4120
## 229	B	0	0	1	90.70	6 27.2100
## 230	A	1	0	2	63.42	8 25.3680
## 231	B	1	0	5	81.37	2 8.1370
## 232	B	0	0	1	10.59	3 1.5885
## 233	B	1	0	0	84.09	9 37.8405

## 234	B	0	1	5	73.82	4 14.7640
## 235	A	0	1	0	51.94	10 25.9700
## 236	A	1	0	3	93.14	2 9.3140
## 237	C	1	1	0	17.41	5 4.3525
## 238	C	0	0	5	44.22	5 11.0550
## 239	B	0	0	1	13.22	5 3.3050
## 240	A	1	1	5	89.69	1 4.4845
## 241	A	1	1	4	24.94	9 11.2230
## 242	A	1	1	0	59.77	2 5.9770
## 243	C	0	1	5	93.20	2 9.3200
## 244	A	0	1	2	62.65	4 12.5300
## 245	B	1	1	2	93.87	8 37.5480
## 246	A	0	1	2	47.59	8 19.0360
## 247	B	0	0	1	81.40	3 12.2100
## 248	A	0	1	5	17.94	5 4.4850
## 249	A	0	1	1	77.72	4 15.5440
## 250	B	1	1	4	73.06	7 25.5710
## 251	B	0	1	4	46.55	9 20.9475
## 252	C	0	1	5	35.19	10 17.5950
## 253	C	1	0	3	14.39	2 1.4390
## 254	A	1	1	2	23.75	4 4.7500
## 255	A	0	1	2	58.90	8 23.5600
## 256	B	0	1	5	32.62	4 6.5240
## 257	A	0	1	1	66.35	1 3.3175
## 258	A	0	1	2	25.91	6 7.7730
## 259	A	0	1	1	32.25	4 6.4500
## 260	C	0	1	1	65.94	4 13.1880
## 261	A	1	0	1	75.06	9 33.7770
## 262	C	1	0	5	16.45	4 3.2900
## 263	B	0	0	5	38.30	4 7.6600
## 264	A	0	0	3	22.24	10 11.1200
## 265	B	1	1	3	54.45	1 2.7225
## 266	A	0	0	3	98.40	7 34.4400
## 267	C	1	1	2	35.47	4 7.0940
## 268	B	0	0	4	74.60	10 37.3000
## 269	A	0	1	2	70.74	4 14.1480
## 270	A	0	0	2	35.54	10 17.7700
## 271	B	1	0	3	67.43	5 16.8575
## 272	C	0	0	0	21.12	2 2.1120
## 273	A	0	0	2	21.54	9 9.6930
## 274	A	1	0	2	12.03	2 1.2030
## 275	B	1	0	0	99.71	6 29.9130
## 276	B	1	1	5	47.97	7 16.7895
## 277	C	0	0	2	21.82	10 10.9100
## 278	C	1	0	5	95.42	4 19.0840
## 279	C	0	1	5	70.99	10 35.4950
## 280	A	0	1	3	44.02	10 22.0100
## 281	A	1	0	2	69.96	8 27.9840
## 282	C	1	1	2	37.00	1 1.8500
## 283	A	1	0	3	15.34	1 0.7670
## 284	A	0	1	0	99.83	6 29.9490
## 285	A	0	0	0	47.67	4 9.5340
## 286	B	1	1	0	66.68	5 16.6700
## 287	C	0	1	2	74.86	1 3.7430

## 288	C	1	0	3	23.75	9 10.6875
## 289	B	1	0	4	48.51	7 16.9785
## 290	A	0	0	2	94.88	7 33.2080
## 291	B	0	1	1	40.30	10 20.1500
## 292	C	1	1	1	27.85	7 9.7475
## 293	A	0	0	1	62.48	1 3.1240
## 294	A	0	0	4	36.36	2 3.6360
## 295	B	1	1	0	18.11	10 9.0550
## 296	C	0	0	1	51.92	5 12.9800
## 297	C	1	1	1	28.84	4 5.7680
## 298	A	0	1	2	78.38	6 23.5140
## 299	A	0	1	2	60.01	4 12.0020
## 300	C	0	0	2	88.61	1 4.4305
## 301	C	1	1	5	99.82	2 9.9820
## 302	B	0	1	0	39.01	1 1.9505
## 303	C	1	1	4	48.61	1 2.4305
## 304	A	1	0	1	51.19	4 10.2380
## 305	B	1	0	1	14.96	8 5.9840
## 306	A	0	1	1	72.20	7 25.2700
## 307	A	1	0	3	40.23	7 14.0805
## 308	A	0	0	2	88.79	8 35.5160
## 309	A	0	0	1	26.48	3 3.9720
## 310	A	1	0	5	81.91	2 8.1910
## 311	B	0	1	3	79.93	6 23.9790
## 312	C	0	1	5	69.33	2 6.9330
## 313	A	0	0	4	14.23	5 3.5575
## 314	A	0	0	0	15.55	9 6.9975
## 315	C	0	0	1	78.13	10 39.0650
## 316	C	0	1	4	99.37	2 9.9370
## 317	C	0	0	4	21.08	3 3.1620
## 318	C	0	1	1	74.79	5 18.6975
## 319	C	0	0	0	29.67	7 10.3845
## 320	C	0	1	0	44.07	4 8.8140
## 321	C	1	0	4	22.93	9 10.3185
## 322	C	1	0	0	39.42	1 1.9710
## 323	A	1	1	0	15.26	6 4.5780
## 324	A	1	0	5	61.77	5 15.4425
## 325	A	1	1	2	21.52	6 6.4560
## 326	B	1	1	3	97.74	4 19.5480
## 327	A	0	1	4	99.78	5 24.9450
## 328	C	0	1	4	94.26	4 18.8520
## 329	B	0	1	0	51.13	4 10.2260
## 330	A	0	1	1	36.36	4 7.2720
## 331	B	1	1	2	22.02	9 9.9090
## 332	A	1	1	4	32.90	3 4.9350
## 333	A	1	1	5	77.02	5 19.2550
## 334	A	0	1	4	23.48	2 2.3480
## 335	C	0	1	3	14.70	5 3.6750
## 336	A	0	0	1	28.45	5 7.1125
## 337	A	1	1	5	76.40	9 34.3800
## 338	B	1	0	3	57.95	6 17.3850
## 339	C	1	0	1	47.65	3 7.1475
## 340	B	0	0	4	42.82	9 19.2690
## 341	B	0	1	1	48.09	3 7.2135

## 342	B	0	0	0	55.97	7 19.5895
## 343	B	0	0	0	76.90	7 26.9150
## 344	C	1	0	4	97.03	5 24.2575
## 345	A	1	1	3	44.65	3 6.6975
## 346	A	1	0	5	77.93	9 35.0685
## 347	A	0	1	1	71.95	1 3.5975
## 348	C	0	0	2	89.25	8 35.7000
## 349	A	1	1	1	26.02	7 9.1070
## 350	B	1	0	0	13.50	10 6.7500
## 351	C	0	0	5	99.30	10 49.6500
## 352	A	1	1	1	51.69	7 18.0915
## 353	B	0	0	5	54.73	7 19.1555
## 354	B	0	1	2	27.00	9 12.1500
## 355	C	1	0	1	30.24	1 1.5120
## 356	B	0	0	4	89.14	4 17.8280
## 357	C	1	0	5	37.55	10 18.7750
## 358	C	1	0	3	95.44	10 47.7200
## 359	B	1	1	1	27.50	3 4.1250
## 360	B	1	1	3	74.97	1 3.7485
## 361	A	0	1	4	80.96	8 32.3840
## 362	C	1	0	4	94.47	8 37.7880
## 363	C	1	1	4	99.79	2 9.9790
## 364	A	1	1	2	73.22	6 21.9660
## 365	C	1	0	4	41.24	4 8.2480
## 366	C	1	0	5	81.68	4 16.3360
## 367	C	1	0	1	51.32	9 23.0940
## 368	A	0	1	2	65.94	4 13.1880
## 369	C	1	0	3	14.36	10 7.1800
## 370	A	0	1	1	21.50	9 9.6750
## 371	B	0	0	1	26.26	7 9.1910
## 372	B	1	0	5	60.96	2 6.0960
## 373	C	1	0	2	70.11	6 21.0330
## 374	C	1	1	5	42.08	6 12.6240
## 375	A	1	0	2	67.09	5 16.7725
## 376	A	0	0	5	96.70	5 24.1750
## 377	B	0	0	2	35.38	9 15.9210
## 378	C	1	1	3	95.49	7 33.4215
## 379	C	0	1	5	96.98	4 19.3960
## 380	B	1	0	1	23.65	4 4.7300
## 381	A	0	1	3	82.33	4 16.4660
## 382	C	1	0	1	26.61	2 2.6610
## 383	B	1	0	4	99.69	5 24.9225
## 384	C	0	0	4	74.89	4 14.9780
## 385	A	1	0	4	40.94	5 10.2350
## 386	B	0	1	3	75.82	1 3.7910
## 387	C	1	1	4	46.77	6 14.0310
## 388	A	1	0	0	32.32	10 16.1600
## 389	C	0	0	5	54.07	9 24.3315
## 390	B	1	1	4	18.22	7 6.3770
## 391	C	0	0	5	80.48	3 12.0720
## 392	B	1	0	5	37.95	10 18.9750
## 393	A	0	1	1	76.82	1 3.8410
## 394	A	0	0	3	52.26	10 26.1300
## 395	A	1	0	0	79.74	1 3.9870

## 396	A	1	0	0	77.50	5 19.3750
## 397	A	1	0	4	54.27	5 13.5675
## 398	B	1	1	2	13.59	9 6.1155
## 399	B	0	0	0	41.06	6 12.3180
## 400	B	0	1	1	19.24	9 8.6580
## 401	C	1	0	4	39.43	6 11.8290
## 402	C	1	1	2	46.22	4 9.2440
## 403	C	0	1	2	13.98	1 0.6990
## 404	B	1	0	5	39.75	5 9.9375
## 405	C	0	0	5	97.79	7 34.2265
## 406	A	0	1	3	67.26	4 13.4520
## 407	A	1	1	4	13.79	5 3.4475
## 408	B	0	0	5	68.71	4 13.7420
## 409	A	1	0	2	56.53	4 11.3060
## 410	C	1	0	5	23.82	5 5.9550
## 411	B	1	0	0	34.21	10 17.1050
## 412	B	1	1	3	21.87	2 2.1870
## 413	A	0	1	0	20.97	5 5.2425
## 414	A	1	1	3	25.84	3 3.8760
## 415	A	1	1	2	50.93	8 20.3720
## 416	B	1	1	0	96.11	1 4.8055
## 417	C	1	0	2	45.38	4 9.0760
## 418	C	0	0	0	81.51	1 4.0755
## 419	B	1	0	0	57.22	2 5.7220
## 420	A	0	0	1	25.22	7 8.8270
## 421	C	0	0	4	38.60	3 5.7900
## 422	C	1	0	1	84.05	3 12.6075
## 423	C	0	0	5	97.21	10 48.6050
## 424	B	0	1	5	25.42	8 10.1680
## 425	C	1	1	5	16.28	1 0.8140
## 426	B	0	1	5	40.61	9 18.2745
## 427	A	0	1	0	53.17	7 18.6095
## 428	B	0	0	4	20.87	3 3.1305
## 429	B	1	1	3	67.27	5 16.8175
## 430	A	0	0	2	90.65	10 45.3250
## 431	B	1	1	5	69.08	2 6.9080
## 432	C	1	1	4	43.27	2 4.3270
## 433	A	1	0	1	23.46	6 7.0380
## 434	B	1	1	5	95.54	7 33.4390
## 435	B	1	0	5	47.44	1 2.3720
## 436	C	1	1	3	99.24	9 44.6580
## 437	C	0	1	3	82.93	4 16.5860
## 438	A	1	1	2	33.99	6 10.1970
## 439	C	0	1	4	17.04	4 3.4080
## 440	C	1	0	1	40.86	8 16.3440
## 441	C	0	1	4	17.44	5 4.3600
## 442	B	0	0	3	88.43	8 35.3720
## 443	A	0	0	2	89.21	9 40.1445
## 444	C	1	1	5	12.78	1 0.6390
## 445	A	1	0	3	19.10	7 6.6850
## 446	B	0	0	0	19.15	1 0.9575
## 447	C	0	1	4	27.66	10 13.8300
## 448	C	1	1	5	45.74	3 6.8610
## 449	B	0	0	0	27.07	1 1.3535

## 450	B	0	0	3	39.12	1 1.9560
## 451	B	1	0	1	74.71	6 22.4130
## 452	B	1	1	1	22.01	6 6.6030
## 453	A	1	0	4	63.61	5 15.9025
## 454	A	1	1	0	25.00	1 1.2500
## 455	A	0	1	1	20.77	4 4.1540
## 456	B	0	0	5	29.56	5 7.3900
## 457	B	0	0	4	77.40	9 34.8300
## 458	B	1	1	1	79.39	10 39.6950
## 459	C	0	0	1	46.57	10 23.2850
## 460	C	1	1	4	35.89	1 1.7945
## 461	C	1	1	4	40.52	5 10.1300
## 462	B	0	0	4	73.05	10 36.5250
## 463	C	1	0	3	73.95	4 14.7900
## 464	C	0	0	4	22.62	1 1.1310
## 465	A	0	1	4	51.34	5 12.8350
## 466	C	0	0	3	54.55	10 27.2750
## 467	C	0	0	0	37.15	7 13.0025
## 468	B	1	1	3	37.02	6 11.1060
## 469	C	1	1	4	21.58	1 1.0790
## 470	C	0	0	1	98.84	1 4.9420
## 471	C	0	0	2	83.77	6 25.1310
## 472	A	0	0	3	40.05	4 8.0100
## 473	A	0	1	5	43.13	10 21.5650
## 474	B	0	1	0	72.57	8 29.0280
## 475	A	0	0	1	64.44	5 16.1100
## 476	A	1	1	0	65.18	3 9.7770
## 477	A	1	0	3	33.26	5 8.3150
## 478	C	1	1	1	84.07	4 16.8140
## 479	B	1	1	3	34.37	10 17.1850
## 480	A	1	1	1	38.60	1 1.9300
## 481	C	1	1	4	65.97	8 26.3880
## 482	C	1	0	1	32.80	10 16.4000
## 483	A	1	1	3	37.14	5 9.2850
## 484	B	0	1	2	60.38	10 30.1900
## 485	C	0	0	3	36.98	10 18.4900
## 486	B	0	0	3	49.49	4 9.8980
## 487	B	1	0	5	41.09	10 20.5450
## 488	A	1	1	5	37.15	4 7.4300
## 489	C	1	1	2	22.96	1 1.1480
## 490	B	0	0	2	77.68	9 34.9560
## 491	B	1	0	5	34.70	2 3.4700
## 492	A	0	0	5	19.66	10 9.8300
## 493	B	0	0	0	25.32	8 10.1280
## 494	C	0	0	2	12.12	10 6.0600
## 495	B	1	1	5	99.89	2 9.9890
## 496	B	1	1	3	75.92	8 30.3680
## 497	C	1	0	1	63.22	2 6.3220
## 498	C	1	0	4	90.24	6 27.0720
## 499	B	0	0	3	98.13	1 4.9065
## 500	A	0	0	3	51.52	8 20.6080
## 501	B	0	1	3	73.97	1 3.6985
## 502	C	0	0	5	31.90	1 1.5950
## 503	C	1	1	2	69.40	2 6.9400

## 504	B	1	0	3	93.31	2 9.3310
## 505	B	1	1	3	88.45	1 4.4225
## 506	A	0	1	1	24.18	8 9.6720
## 507	B	0	0	3	48.50	3 7.2750
## 508	B	1	0	4	84.05	6 25.2150
## 509	B	0	1	0	61.29	5 15.3225
## 510	C	0	0	2	15.95	6 4.7850
## 511	B	0	0	3	90.74	7 31.7590
## 512	A	1	0	2	42.91	5 10.7275
## 513	A	1	0	5	54.28	7 18.9980
## 514	A	1	1	1	99.55	7 34.8425
## 515	C	0	1	3	58.39	7 20.4365
## 516	C	0	0	5	51.47	1 2.5735
## 517	B	0	1	0	54.86	5 13.7150
## 518	C	0	1	2	39.39	5 9.8475
## 519	A	1	1	2	34.73	2 3.4730
## 520	C	0	1	3	71.92	5 17.9800
## 521	B	1	0	1	45.71	3 6.8565
## 522	C	0	0	2	83.17	6 24.9510
## 523	A	0	0	2	37.44	6 11.2320
## 524	C	1	1	0	62.87	2 6.2870
## 525	A	1	1	4	81.71	6 24.5130
## 526	A	0	0	3	91.41	5 22.8525
## 527	B	1	1	5	39.21	4 7.8420
## 528	B	0	1	5	59.86	2 5.9860
## 529	B	0	0	4	54.36	10 27.1800
## 530	A	1	1	3	98.09	9 44.1405
## 531	A	1	1	0	25.43	6 7.6290
## 532	A	0	1	5	86.68	8 34.6720
## 533	B	1	1	1	22.95	10 11.4750
## 534	C	1	0	4	16.31	9 7.3395
## 535	A	1	0	2	28.32	5 7.0800
## 536	C	1	1	2	16.67	7 5.8345
## 537	B	0	0	5	73.96	1 3.6980
## 538	A	1	1	2	97.94	1 4.8970
## 539	A	1	0	5	73.05	4 14.6100
## 540	C	0	0	4	87.48	6 26.2440
## 541	A	1	1	2	30.68	3 4.6020
## 542	C	0	1	0	75.88	1 3.7940
## 543	B	0	0	3	20.18	4 4.0360
## 544	C	0	1	1	18.77	6 5.6310
## 545	B	1	0	4	71.20	1 3.5600
## 546	B	0	1	2	38.81	4 7.7620
## 547	A	1	0	5	29.42	10 14.7100
## 548	A	1	1	3	60.95	9 27.4275
## 549	B	1	0	3	51.54	5 12.8850
## 550	A	1	0	1	66.06	6 19.8180
## 551	B	1	1	5	57.27	3 8.5905
## 552	B	1	0	5	54.31	9 24.4395
## 553	B	1	0	0	58.24	9 26.2080
## 554	C	1	1	1	22.21	6 6.6630
## 555	A	0	1	1	19.32	7 6.7620
## 556	B	1	1	2	37.48	3 5.6220
## 557	B	0	0	5	72.04	2 7.2040

## 558	C	0	0	4	98.52	10 49.2600
## 559	A	0	1	4	41.66	6 12.4980
## 560	A	0	0	2	72.42	3 10.8630
## 561	B	1	1	1	21.58	9 9.7110
## 562	C	1	1	4	89.20	10 44.6000
## 563	B	1	0	1	42.42	8 16.9680
## 564	A	0	1	1	74.51	6 22.3530
## 565	B	1	1	5	99.25	2 9.9250
## 566	A	1	0	4	81.21	10 40.6050
## 567	C	1	0	3	49.33	10 24.6650
## 568	A	1	0	5	65.74	9 29.5830
## 569	B	1	0	5	79.86	7 27.9510
## 570	C	1	0	3	73.98	7 25.8930
## 571	B	0	0	2	82.04	5 20.5100
## 572	B	0	1	3	26.67	10 13.3350
## 573	A	0	1	4	10.13	7 3.5455
## 574	B	1	1	4	72.39	2 7.2390
## 575	A	1	1	3	85.91	5 21.4775
## 576	B	0	1	5	81.31	7 28.4585
## 577	B	1	1	4	60.30	4 12.0600
## 578	C	1	1	4	31.77	4 6.3540
## 579	A	1	0	0	64.27	4 12.8540
## 580	B	1	1	0	69.51	2 6.9510
## 581	C	1	1	4	27.22	3 4.0830
## 582	A	0	0	0	77.68	4 15.5360
## 583	C	0	0	5	92.98	2 9.2980
## 584	B	0	0	5	18.08	4 3.6160
## 585	B	1	1	3	63.06	3 9.4590
## 586	A	1	1	0	51.71	4 10.3420
## 587	A	1	0	4	52.34	3 7.8510
## 588	A	1	0	3	43.06	5 10.7650
## 589	C	1	1	5	59.61	10 29.8050
## 590	A	1	1	0	14.62	5 3.6550
## 591	C	0	1	0	46.53	6 13.9590
## 592	C	0	0	2	24.24	7 8.4840
## 593	A	0	0	3	45.58	1 2.2790
## 594	A	0	0	3	75.20	3 11.2800
## 595	B	0	1	3	96.80	3 14.5200
## 596	B	1	1	0	14.82	3 2.2230
## 597	A	1	1	4	52.20	3 7.8300
## 598	C	1	0	3	46.66	9 20.9970
## 599	C	1	0	5	36.85	5 9.2125
## 600	A	0	0	2	70.32	2 7.0320
## 601	C	1	1	1	83.08	1 4.1540
## 602	C	1	0	5	64.99	1 3.2495
## 603	C	1	1	4	77.56	10 38.7800
## 604	B	1	0	3	54.51	6 16.3530
## 605	C	0	0	5	51.89	7 18.1615
## 606	B	1	1	2	31.75	4 6.3500
## 607	A	0	0	5	53.65	7 18.7775
## 608	C	0	0	4	49.79	4 9.9580
## 609	A	1	1	5	30.61	1 1.5305
## 610	B	0	1	4	57.89	2 5.7890
## 611	A	1	0	1	28.96	1 1.4480

## 612	C	0	0	4	98.97	9 44.5365
## 613	B	0	1	5	93.22	3 13.9830
## 614	C	0	1	3	80.93	1 4.0465
## 615	A	0	1	4	67.45	10 33.7250
## 616	A	0	0	3	38.72	9 17.4240
## 617	B	0	1	3	72.60	6 21.7800
## 618	C	0	1	1	87.91	5 21.9775
## 619	A	0	1	4	98.53	6 29.5590
## 620	C	0	0	5	43.46	6 13.0380
## 621	A	1	0	4	71.68	3 10.7520
## 622	A	0	0	4	91.61	1 4.5805
## 623	B	0	0	2	94.59	7 33.1065
## 624	B	1	0	5	83.25	10 41.6250
## 625	B	0	1	5	91.35	1 4.5675
## 626	B	0	0	4	78.88	2 7.8880
## 627	A	1	1	3	60.87	2 6.0870
## 628	B	0	1	0	82.58	10 41.2900
## 629	A	0	1	2	53.30	3 7.9950
## 630	A	1	0	5	12.09	1 0.6045
## 631	A	1	1	3	64.19	10 32.0950
## 632	A	1	1	1	78.31	3 11.7465
## 633	A	0	1	4	83.77	2 8.3770
## 634	B	1	1	2	99.70	3 14.9550
## 635	B	0	1	4	79.91	3 11.9865
## 636	B	0	1	0	66.47	10 33.2350
## 637	A	1	1	0	28.95	7 10.1325
## 638	C	1	0	1	46.20	1 2.3100
## 639	B	0	0	4	17.63	5 4.4075
## 640	B	1	1	5	52.42	3 7.8630
## 641	B	0	0	4	98.79	3 14.8185
## 642	C	0	0	1	88.55	8 35.4200
## 643	B	0	1	1	55.67	2 5.5670
## 644	C	0	0	4	72.52	8 29.0080
## 645	C	0	1	1	12.05	5 3.0125
## 646	A	0	1	2	19.36	9 8.7120
## 647	C	1	1	0	70.21	6 21.0630
## 648	B	0	1	5	33.63	1 1.6815
## 649	C	0	0	3	15.49	2 1.5490
## 650	C	1	1	1	24.74	10 12.3700
## 651	B	1	1	1	75.66	5 18.9150
## 652	B	1	0	0	55.81	6 16.7430
## 653	A	0	1	2	72.78	10 36.3900
## 654	B	0	1	3	37.32	9 16.7940
## 655	B	0	1	5	60.18	4 12.0360
## 656	A	1	0	1	15.69	3 2.3535
## 657	C	1	0	1	99.69	1 4.9845
## 658	A	0	0	5	88.15	3 13.2225
## 659	A	0	0	3	27.93	5 6.9825
## 660	A	0	1	5	55.45	1 2.7725
## 661	B	1	0	3	42.97	3 6.4455
## 662	C	0	1	3	17.14	7 5.9990
## 663	B	0	0	5	58.75	6 17.6250
## 664	C	0	0	4	87.10	10 43.5500
## 665	C	1	0	3	98.80	2 9.8800

## 666	A	1	0	5	48.63	4 9.7260
## 667	B	0	1	4	57.74	3 8.6610
## 668	B	1	0	0	17.97	4 3.5940
## 669	C	0	0	0	47.71	6 14.3130
## 670	B	1	0	3	40.62	2 4.0620
## 671	A	0	1	5	56.04	10 28.0200
## 672	B	0	1	4	93.40	2 9.3400
## 673	B	1	0	0	73.41	3 11.0115
## 674	C	1	1	0	33.64	8 13.4560
## 675	A	1	0	1	45.48	10 22.7400
## 676	B	0	1	5	83.77	2 8.3770
## 677	B	0	0	3	64.08	7 22.4280
## 678	A	0	0	4	73.47	4 14.6940
## 679	C	1	1	0	58.95	10 29.4750
## 680	A	0	1	4	48.50	6 14.5500
## 681	B	0	0	1	39.48	1 1.9740
## 682	B	1	0	3	34.81	1 1.7405
## 683	C	1	0	5	49.32	6 14.7960
## 684	A	0	1	5	21.48	2 2.1480
## 685	B	0	0	3	23.08	6 6.9240
## 686	B	0	0	2	49.10	2 4.9100
## 687	B	0	0	3	64.83	2 6.4830
## 688	A	0	1	2	63.56	10 31.7800
## 689	C	0	1	3	72.88	2 7.2880
## 690	A	1	0	4	67.10	3 10.0650
## 691	C	0	0	3	70.19	9 31.5855
## 692	C	0	1	4	55.04	7 19.2640
## 693	A	0	1	0	48.63	10 24.3150
## 694	C	0	0	5	73.38	7 25.6830
## 695	C	1	0	4	52.60	9 23.6700
## 696	A	0	0	2	87.37	5 21.8425
## 697	A	0	0	3	27.04	4 5.4080
## 698	B	1	1	2	62.19	4 12.4380
## 699	A	0	1	1	69.58	9 31.3110
## 700	C	1	1	2	97.50	10 48.7500
## 701	C	1	0	5	60.41	8 24.1640
## 702	B	1	1	4	32.32	3 4.8480
## 703	B	0	0	5	19.77	10 9.8850
## 704	B	0	1	0	80.47	9 36.2115
## 705	B	0	0	2	88.39	9 39.7755
## 706	B	1	1	0	71.77	7 25.1195
## 707	B	1	0	1	43.00	4 8.6000
## 708	C	0	1	4	68.98	1 3.4490
## 709	C	1	1	5	15.62	8 6.2480
## 710	A	1	1	3	25.70	3 3.8550
## 711	A	0	1	4	80.62	6 24.1860
## 712	C	0	0	2	75.53	4 15.1060
## 713	C	1	0	1	77.63	9 34.9335
## 714	C	1	0	0	13.85	9 6.2325
## 715	C	0	1	5	98.70	8 39.4800
## 716	A	1	0	0	35.68	5 8.9200
## 717	A	0	0	5	71.46	7 25.0110
## 718	A	0	1	1	11.94	3 1.7910
## 719	A	1	1	5	45.38	3 6.8070

## 720	B	0	0	5	17.48	6 5.2440
## 721	B	1	0	5	25.56	7 8.9460
## 722	C	0	0	3	90.63	9 40.7835
## 723	B	1	1	2	44.12	3 6.6180
## 724	C	0	0	4	36.77	7 12.8695
## 725	B	0	1	4	23.34	4 4.6680
## 726	C	0	0	0	28.50	8 11.4000
## 727	C	0	1	2	55.57	3 8.3355
## 728	B	1	1	3	69.74	10 34.8700
## 729	C	1	1	5	97.26	4 19.4520
## 730	B	0	0	2	52.18	7 18.2630
## 731	A	0	0	5	22.32	4 4.4640
## 732	A	1	1	0	56.00	3 8.4000
## 733	A	0	1	5	19.70	1 0.9850
## 734	B	1	1	1	75.88	7 26.5580
## 735	B	0	1	4	53.72	1 2.6860
## 736	C	0	1	0	81.95	10 40.9750
## 737	C	0	0	2	81.20	7 28.4200
## 738	C	1	1	1	58.76	10 29.3800
## 739	B	0	1	1	91.56	8 36.6240
## 740	A	1	1	2	93.96	9 42.2820
## 741	C	1	1	2	55.61	7 19.4635
## 742	C	1	1	4	84.83	1 4.2415
## 743	A	0	0	3	71.63	2 7.1630
## 744	A	0	1	2	37.69	2 3.7690
## 745	C	0	0	3	31.67	8 12.6680
## 746	C	0	0	4	38.42	1 1.9210
## 747	B	0	1	5	65.23	10 32.6150
## 748	C	0	0	2	10.53	5 2.6325
## 749	B	0	0	2	12.29	9 5.5305
## 750	C	0	1	0	81.23	7 28.4305
## 751	B	0	0	5	22.32	4 4.4640
## 752	A	1	0	4	27.28	5 6.8200
## 753	A	0	0	1	17.42	10 8.7100
## 754	B	1	1	2	73.28	5 18.3200
## 755	C	0	0	5	84.87	3 12.7305
## 756	A	1	0	5	97.29	8 38.9160
## 757	B	0	0	1	35.74	8 14.2960
## 758	A	1	0	2	96.52	6 28.9560
## 759	A	0	1	4	18.85	10 9.4250
## 760	A	1	0	4	55.39	4 11.0780
## 761	B	0	0	4	77.20	10 38.6000
## 762	B	1	1	1	72.13	10 36.0650
## 763	A	0	0	5	63.88	8 25.5520
## 764	A	0	0	0	10.69	5 2.6725
## 765	A	0	1	0	55.50	4 11.1000
## 766	B	1	0	2	95.46	8 38.1840
## 767	C	1	0	5	76.06	3 11.4090
## 768	B	1	1	3	13.69	6 4.1070
## 769	B	1	0	1	95.64	4 19.1280
## 770	A	1	0	2	11.43	6 3.4290
## 771	B	0	0	3	95.54	4 19.1080
## 772	C	0	0	0	85.87	7 30.0545
## 773	C	0	0	3	67.99	7 23.7965

## 774	C	1	0	4	52.42	1 2.6210
## 775	C	0	1	4	65.65	2 6.5650
## 776	B	1	0	4	28.86	5 7.2150
## 777	C	0	1	0	65.31	7 22.8585
## 778	B	1	1	3	93.38	1 4.6690
## 779	C	0	1	3	25.25	5 6.3125
## 780	B	0	1	1	87.87	9 39.5415
## 781	C	1	1	0	21.80	8 8.7200
## 782	A	1	0	3	94.76	4 18.9520
## 783	A	0	0	5	30.62	1 1.5310
## 784	C	1	0	2	44.01	8 17.6040
## 785	C	0	0	0	10.16	5 2.5400
## 786	A	1	1	1	74.58	7 26.1030
## 787	C	1	1	1	71.89	8 28.7560
## 788	C	1	0	0	10.99	5 2.7475
## 789	C	0	1	0	60.47	3 9.0705
## 790	A	1	1	3	58.91	7 20.6185
## 791	A	1	1	5	46.41	1 2.3205
## 792	C	0	1	0	68.55	4 13.7100
## 793	B	1	0	2	97.37	10 48.6850
## 794	A	0	1	1	92.60	7 32.4100
## 795	A	1	0	1	46.61	2 4.6610
## 796	B	1	1	5	27.18	2 2.7180
## 797	C	0	0	2	60.87	1 3.0435
## 798	A	0	0	3	24.49	10 12.2450
## 799	B	1	1	0	92.78	1 4.6390
## 800	C	0	1	2	86.69	5 21.6725
## 801	B	1	1	3	23.01	6 6.9030
## 802	C	0	0	1	30.20	8 12.0800
## 803	C	0	1	5	67.39	7 23.5865
## 804	A	0	0	5	48.96	9 22.0320
## 805	B	0	0	1	75.59	9 34.0155
## 806	A	1	0	2	77.47	4 15.4940
## 807	A	1	0	3	93.18	2 9.3180
## 808	A	1	0	1	50.23	4 10.0460
## 809	B	1	0	0	17.75	1 0.8875
## 810	C	1	0	5	62.18	10 31.0900
## 811	B	1	1	0	10.75	8 4.3000
## 812	A	1	0	1	40.26	10 20.1300
## 813	C	0	0	3	64.97	5 16.2425
## 814	A	1	1	1	95.15	1 4.7575
## 815	A	0	0	1	48.62	8 19.4480
## 816	B	1	0	4	53.21	8 21.2840
## 817	C	1	0	5	45.44	7 15.9040
## 818	A	1	1	4	33.88	8 13.5520
## 819	B	0	1	0	96.16	4 19.2320
## 820	B	0	1	4	47.16	5 11.7900
## 821	B	1	1	1	52.89	4 10.5780
## 822	A	0	0	2	47.68	2 4.7680
## 823	C	0	1	3	10.17	1 0.5085
## 824	A	1	0	0	68.71	3 10.3065
## 825	B	0	0	3	60.08	7 21.0280
## 826	A	0	0	3	22.01	4 4.4020
## 827	B	0	0	0	72.11	9 32.4495

## 828	A	0	1	5	41.28	3 6.1920
## 829	C	1	1	1	64.95	10 32.4750
## 830	A	0	0	1	74.22	10 37.1100
## 831	A	1	1	1	10.56	8 4.2240
## 832	B	1	1	0	62.57	4 12.5140
## 833	B	0	0	3	11.85	8 4.7400
## 834	A	0	1	0	91.30	1 4.5650
## 835	B	0	0	2	40.73	7 14.2555
## 836	A	1	1	5	52.38	1 2.6190
## 837	A	0	1	5	38.54	5 9.6350
## 838	B	1	1	3	44.63	6 13.3890
## 839	C	1	1	1	55.87	10 27.9350
## 840	C	0	0	3	29.22	6 8.7660
## 841	A	1	1	5	51.94	3 7.7910
## 842	B	1	1	1	60.30	1 3.0150
## 843	A	0	0	3	39.47	2 3.9470
## 844	C	0	0	4	14.87	2 1.4870
## 845	A	1	1	5	21.32	1 1.0660
## 846	A	0	1	1	93.78	3 14.0670
## 847	A	0	1	1	73.26	1 3.6630
## 848	C	1	0	3	22.38	1 1.1190
## 849	C	0	0	4	72.88	9 32.7960
## 850	A	1	0	5	99.10	6 29.7300
## 851	A	1	1	5	74.10	1 3.7050
## 852	A	1	0	5	98.48	2 9.8480
## 853	C	1	1	0	53.19	7 18.6165
## 854	B	1	0	1	52.79	10 26.3950
## 855	A	0	0	0	95.95	5 23.9875
## 856	B	1	0	5	36.51	9 16.4295
## 857	B	1	1	4	21.12	8 8.4480
## 858	A	0	0	2	28.31	4 5.6620
## 859	B	1	1	0	57.59	6 17.2770
## 860	A	0	0	4	47.63	9 21.4335
## 861	C	0	0	2	86.27	1 4.3135
## 862	A	0	1	3	12.76	2 1.2760
## 863	B	1	0	2	11.28	9 5.0760
## 864	B	1	0	2	51.07	7 17.8745
## 865	A	0	0	1	79.59	3 11.9385
## 866	C	0	1	0	33.81	3 5.0715
## 867	B	0	1	3	90.53	8 36.2120
## 868	C	0	0	0	62.82	2 6.2820
## 869	C	0	1	4	24.31	3 3.6465
## 870	A	1	1	3	64.59	4 12.9180
## 871	A	0	1	4	24.82	7 8.6870
## 872	C	1	1	5	56.50	1 2.8250
## 873	B	0	0	1	21.43	10 10.7150
## 874	A	0	1	3	89.06	6 26.7180
## 875	A	0	1	2	23.29	4 4.6580
## 876	C	1	1	2	65.26	8 26.1040
## 877	C	0	1	5	52.35	1 2.6175
## 878	B	0	1	1	39.75	1 1.9875
## 879	A	1	0	1	90.02	8 36.0080
## 880	B	0	0	1	12.10	8 4.8400
## 881	B	0	0	4	33.21	10 16.6050

## 882	C	0	0	5	10.18	8 4.0720
## 883	B	0	1	3	31.99	10 15.9950
## 884	A	0	0	2	34.42	6 10.3260
## 885	A	0	0	4	83.34	2 8.3340
## 886	A	1	1	3	45.58	7 15.9530
## 887	A	0	1	4	87.90	1 4.3950
## 888	A	0	0	1	73.47	10 36.7350
## 889	C	1	0	5	12.19	8 4.8760
## 890	A	0	1	3	76.92	10 38.4600
## 891	C	1	0	0	83.66	5 20.9150
## 892	B	1	0	1	57.91	8 23.1640
## 893	C	0	0	5	92.49	5 23.1225
## 894	B	1	1	1	28.38	5 7.0950
## 895	B	0	1	1	50.45	6 15.1350
## 896	B	1	1	0	99.16	8 39.6640
## 897	C	1	1	5	60.74	7 21.2590
## 898	C	0	0	4	47.27	6 14.1810
## 899	C	0	1	0	85.60	7 29.9600
## 900	A	0	1	4	35.04	9 15.7680
## 901	C	0	0	1	44.84	9 20.1780
## 902	B	1	1	2	45.97	4 9.1940
## 903	A	0	0	0	27.73	5 6.9325
## 904	A	1	1	4	11.53	7 4.0355
## 905	C	1	0	0	58.32	2 5.8320
## 906	C	0	0	2	78.38	4 15.6760
## 907	C	1	1	0	84.61	10 42.3050
## 908	B	1	0	0	82.88	5 20.7200
## 909	A	0	0	4	79.54	2 7.9540
## 910	B	1	0	2	49.01	10 24.5050
## 911	B	0	0	4	29.15	3 4.3725
## 912	C	1	0	1	56.13	4 11.2260
## 913	A	1	0	2	93.12	8 37.2480
## 914	A	0	1	5	51.34	8 20.5360
## 915	A	0	0	4	99.60	3 14.9400
## 916	C	1	0	1	35.49	6 10.6470
## 917	C	0	1	3	42.85	1 2.1425
## 918	A	1	0	5	94.67	4 18.9340
## 919	B	1	1	2	68.97	3 10.3455
## 920	B	0	0	1	26.26	3 3.9390
## 921	C	0	0	2	35.79	9 16.1055
## 922	B	1	0	2	16.37	6 4.9110
## 923	C	0	0	2	12.73	2 1.2730
## 924	C	1	0	3	83.14	7 29.0990
## 925	C	0	0	3	35.22	6 10.5660
## 926	B	1	0	1	13.78	4 2.7560
## 927	B	0	1	3	88.31	1 4.4155
## 928	A	0	0	0	39.62	9 17.8290
## 929	B	1	0	1	88.25	9 39.7125
## 930	B	1	1	3	25.31	2 2.5310
## 931	B	1	1	2	99.92	6 29.9760
## 932	C	0	0	5	83.35	2 8.3350
## 933	A	1	0	4	74.44	10 37.2200
## 934	C	1	1	0	64.08	7 22.4280
## 935	B	1	0	2	63.15	6 18.9450

## 936	C	0	1	2	85.72	3 12.8580
## 937	C	1	0	0	78.89	7 27.6115
## 938	A	1	0	3	89.48	5 22.3700
## 939	A	0	0	0	92.09	3 13.8135
## 940	C	1	0	4	57.29	6 17.1870
## 941	A	1	1	4	66.52	4 13.3040
## 942	C	0	1	5	99.82	9 44.9190
## 943	A	1	0	2	45.68	10 22.8400
## 944	A	1	1	0	50.79	5 12.6975
## 945	A	0	1	0	10.08	7 3.5280
## 946	A	1	0	1	93.88	7 32.8580
## 947	C	0	1	1	84.25	2 8.4250
## 948	B	0	1	5	53.78	1 2.6890
## 949	C	0	1	2	35.81	5 8.9525
## 950	B	1	0	4	26.43	8 10.5720
## 951	B	0	1	0	39.91	3 5.9865
## 952	B	0	0	2	21.90	3 3.2850
## 953	B	0	0	4	62.85	4 12.5700
## 954	C	0	0	4	21.04	4 4.2080
## 955	B	0	1	2	65.91	6 19.7730
## 956	A	1	0	5	42.57	7 14.8995
## 957	C	0	1	4	50.49	9 22.7205
## 958	B	1	1	1	46.02	6 13.8060
## 959	C	1	0	2	15.80	10 7.9000
## 960	A	0	0	4	98.66	9 44.3970
## 961	C	0	1	5	91.98	1 4.5990
## 962	A	0	1	1	20.89	2 2.0890
## 963	A	1	0	5	15.50	1 0.7750
## 964	C	0	1	1	96.82	3 14.5230
## 965	B	1	1	4	33.33	2 3.3330
## 966	B	1	0	1	38.27	2 3.8270
## 967	A	1	0	2	33.30	9 14.9850
## 968	A	0	1	2	81.01	3 12.1515
## 969	A	1	0	0	15.80	3 2.3700
## 970	B	0	0	1	34.49	5 8.6225
## 971	B	0	0	4	84.63	10 42.3150
## 972	B	0	1	2	36.91	7 12.9185
## 973	B	1	1	1	87.08	7 30.4780
## 974	A	1	1	2	80.08	3 12.0120
## 975	C	1	1	5	86.13	2 8.6130
## 976	B	0	1	5	49.92	2 4.9920
## 977	A	1	0	4	74.66	4 14.9320
## 978	B	0	1	4	26.60	6 7.9800
## 979	B	1	0	1	25.45	1 1.2725
## 980	B	1	0	4	67.77	1 3.3885
## 981	C	0	1	4	59.59	4 11.9180
## 982	A	1	1	0	58.15	4 11.6300
## 983	A	0	0	3	97.48	9 43.8660
## 984	C	1	1	0	99.96	7 34.9860
## 985	C	1	1	1	96.37	7 33.7295
## 986	B	1	0	5	63.71	5 15.9275
## 987	B	1	0	0	14.76	2 1.4760
## 988	B	0	1	0	62.00	8 24.8000
## 989	C	0	1	1	82.34	10 41.1700

## 990	B	0	1	0	75.37	8 30.1480
## 991	A	1	0	4	56.56	5 14.1400
## 992	B	1	0	3	76.60	10 38.3000
## 993	A	1	1	1	58.03	2 5.8030
## 994	B	1	1	5	17.49	10 8.7450
## 995	C	0	0	1	60.95	1 3.0475
## 996	C	1	1	0	40.35	1 2.0175
## 997	B	1	0	2	97.38	10 48.6900
## 998	A	0	1	4	31.84	1 1.5920
## 999	A	1	1	2	65.82	1 3.2910
## 1000	A	0	0	5	88.34	7 30.9190

##	Payment	cogs	gross.income	Rating	Total
## 1	0	522.83	26.1415	9.1	548.9715
## 2	1	76.40	3.8200	9.6	80.2200
## 3	2	324.31	16.2155	7.4	340.5255
## 4	0	465.76	23.2880	8.4	489.0480
## 5	0	604.17	30.2085	5.3	634.3785
## 6	0	597.73	29.8865	4.1	627.6165
## 7	0	413.04	20.6520	5.8	433.6920
## 8	0	735.60	36.7800	8.0	772.3800
## 9	2	72.52	3.6260	7.2	76.1460
## 10	2	164.52	8.2260	5.9	172.7460
## 11	0	57.92	2.8960	4.5	60.8160
## 12	1	102.04	5.1020	6.8	107.1420
## 13	0	234.75	11.7375	7.1	246.4875
## 14	0	431.90	21.5950	8.2	453.4950
## 15	1	713.80	35.6900	5.7	749.4900
## 16	1	562.32	28.1160	4.5	590.4360
## 17	2	482.51	24.1255	4.6	506.6355
## 18	2	435.66	21.7830	6.9	457.4430
## 19	2	164.01	8.2005	8.6	172.2105
## 20	0	80.60	4.0300	4.4	84.6300
## 21	0	430.20	21.5100	4.8	451.7100
## 22	0	263.94	13.1970	5.1	277.1370
## 23	2	66.40	3.3200	4.4	69.7200
## 24	0	172.80	8.6400	9.9	181.4400
## 25	0	265.89	13.2945	6.0	279.1845
## 26	2	420.72	21.0360	8.5	441.7560
## 27	1	33.52	1.6760	6.7	35.1960
## 28	2	175.34	8.7670	7.7	184.1070
## 29	1	441.80	22.0900	9.6	463.8900
## 30	1	224.01	11.2005	7.4	235.2105
## 31	2	470.65	23.5325	4.8	494.1825
## 32	1	702.63	35.1315	4.5	737.7615
## 33	1	670.24	33.5120	5.1	703.7520
## 34	2	193.16	9.6580	5.1	202.8180
## 35	0	397.68	19.8840	7.5	417.5640
## 36	0	68.12	3.4060	6.8	71.5260
## 37	0	313.10	15.6550	7.0	328.7550
## 38	0	547.92	27.3960	4.7	575.3160
## 39	0	439.36	21.9680	7.6	461.3280
## 40	1	240.96	12.0480	7.7	253.0080
## 41	0	86.72	4.3360	7.9	91.0560
## 42	1	112.22	5.6110	6.3	117.8310

## 43	1	414.72	20.7360	5.6	435.4560
## 44	1	789.60	39.4800	7.6	829.0800
## 45	1	30.74	1.5370	7.2	32.2770
## 46	1	375.84	18.7920	9.5	394.6320
## 47	2	510.21	25.5105	8.4	535.7205
## 48	0	180.09	9.0045	4.1	189.0945
## 49	2	113.58	5.6790	8.1	119.2590
## 50	0	826.30	41.3150	7.9	867.6150
## 51	1	639.80	31.9900	9.5	671.7900
## 52	1	222.95	11.1475	8.5	234.0975
## 53	0	71.48	3.5740	6.5	75.0540
## 54	2	15.43	0.7715	6.1	16.2015
## 55	0	32.32	1.6160	6.5	33.9360
## 56	1	687.84	34.3920	8.2	722.2320
## 57	1	88.68	4.4340	5.8	93.1140
## 58	0	716.80	35.8400	6.6	752.6400
## 59	1	723.50	36.1750	5.4	759.6750
## 60	1	183.66	9.1830	9.3	192.8430
## 61	2	74.22	3.7110	10.0	77.9310
## 62	0	334.38	16.7190	7.0	351.0990
## 63	0	495.63	24.7815	10.0	520.4115
## 64	2	158.10	7.9050	8.6	166.0050
## 65	1	302.96	15.1480	7.6	318.1080
## 66	1	158.70	7.9350	5.8	166.6350
## 67	0	66.94	3.3470	6.7	70.2870
## 68	0	585.66	29.2830	9.9	614.9430
## 69	1	787.70	39.3850	6.4	827.0850
## 70	1	18.33	0.9165	4.3	19.2465
## 71	2	894.80	44.7400	9.6	939.5400
## 72	1	621.20	31.0600	5.9	652.2600
## 73	0	145.56	7.2780	4.0	152.8380
## 74	1	455.46	22.7730	8.7	478.2330
## 75	0	672.03	33.6015	9.4	705.6315
## 76	2	416.50	20.8250	5.4	437.3250
## 77	2	441.36	22.0680	8.6	463.4280
## 78	2	180.09	9.0045	5.7	189.0945
## 79	0	783.10	39.1550	6.6	822.2550
## 80	1	101.90	5.0950	6.0	106.9950
## 81	2	595.14	29.7570	5.5	624.8970
## 82	0	290.04	14.5020	6.4	304.5420
## 83	0	154.00	7.7000	6.6	161.7000
## 84	2	321.44	16.0720	8.3	337.5120
## 85	1	244.55	12.2275	6.6	256.7775
## 86	0	581.42	29.0710	4.0	610.4910
## 87	1	382.60	19.1300	9.9	401.7300
## 88	2	345.66	17.2830	7.3	362.9430
## 89	1	42.47	2.1235	5.7	44.5935
## 90	1	461.94	23.0970	6.1	485.0370
## 91	1	189.52	9.4760	7.1	198.9960
## 92	0	448.60	22.4300	8.2	471.0300
## 93	0	153.86	7.6930	5.1	161.5530
## 94	2	579.24	28.9620	8.6	608.2020
## 95	2	89.75	4.4875	6.6	94.2375
## 96	0	97.16	4.8580	7.2	102.0180

## 97	0	878.70	43.9350	5.1	922.6350
## 98	1	74.70	3.7350	4.1	78.4350
## 99	0	158.25	7.9125	9.3	166.1625
## 100	1	496.20	24.8100	7.4	521.0100
## 101	1	48.71	2.4355	4.1	51.1455
## 102	1	706.95	35.3475	7.2	742.2975
## 103	1	207.63	10.3815	4.9	218.0115
## 104	1	349.56	17.4780	9.9	367.0380
## 105	1	212.45	10.6225	8.0	223.0725
## 106	0	886.70	44.3350	7.3	931.0350
## 107	2	164.28	8.2140	7.9	172.4940
## 108	1	372.78	18.6390	7.4	391.4190
## 109	1	305.82	15.2910	4.2	321.1110
## 110	1	819.70	40.9850	9.2	860.6850
## 111	0	32.98	1.6490	4.6	34.6290
## 112	2	294.63	14.7315	7.8	309.3615
## 113	1	509.88	25.4940	8.4	535.3740
## 114	0	522.63	26.1315	4.3	548.7615
## 115	2	727.11	36.3555	9.5	763.4655
## 116	2	81.06	4.0530	7.1	85.1130
## 117	0	109.70	5.4850	5.3	115.1850
## 118	0	51.36	2.5680	5.2	53.9280
## 119	0	109.60	5.4800	6.0	115.0800
## 120	0	106.88	5.3440	4.1	112.2240
## 121	2	796.48	39.8240	5.2	836.3040
## 122	2	399.84	19.9920	6.5	419.8320
## 123	2	899.64	44.9820	4.2	944.6220
## 124	2	511.28	25.5640	4.6	536.8440
## 125	0	451.76	22.5880	7.3	474.3480
## 126	2	655.83	32.7915	4.5	688.6215
## 127	1	161.25	8.0625	9.0	169.3125
## 128	2	285.57	14.2785	5.9	299.8485
## 129	0	548.32	27.4160	8.5	575.7360
## 130	0	812.52	40.6260	7.2	853.1460
## 131	1	277.34	13.8670	7.5	291.2070
## 132	1	552.78	27.6390	8.3	580.4190
## 133	1	139.36	6.9680	7.4	146.3280
## 134	2	524.70	26.2350	8.8	550.9350
## 135	0	487.80	24.3900	5.3	512.1900
## 136	1	270.66	13.5330	6.2	284.1930
## 137	2	131.55	6.5775	8.8	138.1275
## 138	1	206.52	10.3260	9.8	216.8460
## 139	1	519.10	25.9550	8.2	545.0550
## 140	0	580.00	29.0000	9.2	609.0000
## 141	2	898.00	44.9000	5.4	942.9000
## 142	1	905.00	45.2500	8.1	950.2500
## 143	1	686.00	34.3000	9.1	720.3000
## 144	2	30.41	1.5205	8.4	31.9305
## 145	0	467.70	23.3850	8.0	491.0850
## 146	2	277.56	13.8780	9.5	291.4380
## 147	0	301.40	15.0700	9.2	316.4700
## 148	2	264.56	13.2280	5.6	277.7880
## 149	2	574.88	28.7440	6.2	603.6240
## 150	2	259.68	12.9840	4.9	272.6640

## 151	2	366.16	18.3080	4.8	384.4680
## 152	2	241.92	12.0960	7.3	254.0160
## 153	2	749.16	37.4580	7.4	786.6180
## 154	0	98.88	4.9440	9.9	103.8240
## 155	1	647.76	32.3880	9.3	680.1480
## 156	2	461.45	23.0725	9.0	484.5225
## 157	1	72.17	3.6085	6.1	75.7785
## 158	0	251.40	12.5700	9.7	263.9700
## 159	0	874.98	43.7490	6.0	918.7290
## 160	0	560.34	28.0170	10.0	588.3570
## 161	2	345.44	17.2720	8.3	362.7120
## 162	1	63.69	3.1845	6.0	66.8745
## 163	2	320.53	16.0265	7.0	336.5565
## 164	0	152.80	7.6400	6.5	160.4400
## 165	2	399.00	19.9500	5.9	418.9500
## 166	0	340.56	17.0280	5.6	357.5880
## 167	1	955.80	47.7900	4.8	1003.5900
## 168	2	989.80	49.4900	8.7	1039.2900
## 169	1	307.68	15.3840	6.5	323.0640
## 170	2	486.64	24.3320	8.5	510.9720
## 171	0	350.05	17.5025	5.5	367.5525
## 172	2	400.25	20.0125	9.4	420.2625
## 173	1	166.80	8.3400	6.3	175.1400
## 174	2	317.34	15.8670	9.8	333.2070
## 175	0	158.32	7.9160	8.7	166.2360
## 176	0	304.56	15.2280	8.8	319.7880
## 177	2	177.36	8.8680	9.6	186.2280
## 178	2	157.57	7.8785	4.8	165.4485
## 179	0	443.28	22.1640	4.4	465.4440
## 180	0	260.40	13.0200	9.9	273.4200
## 181	1	449.82	22.4910	5.7	472.3110
## 182	1	307.76	15.3880	7.7	323.1480
## 183	0	155.00	7.7500	8.0	162.7500
## 184	0	274.48	13.7240	5.7	288.2040
## 185	2	86.38	4.3190	6.7	90.6990
## 186	0	54.24	2.7120	8.0	56.9520
## 187	0	755.92	37.7960	7.5	793.7160
## 188	1	185.88	9.2940	7.0	195.1740
## 189	0	74.07	3.7035	9.9	77.7735
## 190	2	279.24	13.9620	5.9	293.2020
## 191	2	231.12	11.5560	7.2	242.6760
## 192	0	147.04	7.3520	4.6	154.3920
## 193	1	790.20	39.5100	9.2	829.7100
## 194	0	102.20	5.1100	5.7	107.3100
## 195	2	163.55	8.1775	9.9	171.7275
## 196	1	74.29	3.7145	5.0	78.0045
## 197	1	87.40	4.3700	4.9	91.7700
## 198	0	25.29	1.2645	6.1	26.5545
## 199	2	166.00	8.3000	8.2	174.3000
## 200	2	356.95	17.8475	5.5	374.7975
## 201	2	114.90	5.7450	6.8	120.6450
## 202	1	229.96	11.4980	6.6	241.4580
## 203	1	429.87	21.4935	9.8	451.3635
## 204	0	259.00	12.9500	8.7	271.9500

## 205	2	88.85	4.4425	5.4	93.2925
## 206	0	207.27	10.3635	7.9	217.6335
## 207	2	599.85	29.9925	9.7	629.8425
## 208	0	285.30	14.2650	7.8	299.5650
## 209	0	91.11	4.5555	5.1	95.6655
## 210	2	897.57	44.8785	6.5	942.4485
## 211	0	236.07	11.8035	5.9	247.8735
## 212	1	839.34	41.9670	8.8	881.3070
## 213	0	461.80	23.0900	4.9	484.8900
## 214	2	139.26	6.9630	4.4	146.2230
## 215	1	207.27	10.3635	6.5	217.6335
## 216	2	18.28	0.9140	8.3	19.1940
## 217	1	123.85	6.1925	8.5	130.0425
## 218	1	283.92	14.1960	5.5	298.1160
## 219	0	758.96	37.9480	8.7	796.9080
## 220	2	172.02	8.6010	7.9	180.6210
## 221	0	272.10	13.6050	6.1	285.7050
## 222	0	434.56	21.7280	5.4	456.2880
## 223	1	59.05	2.9525	9.4	62.0025
## 224	1	12.54	0.6270	8.2	13.1670
## 225	1	86.50	4.3250	6.2	90.8250
## 226	2	174.32	8.7160	9.7	183.0360
## 227	0	624.33	31.2165	4.0	655.5465
## 228	0	148.24	7.4120	9.7	155.6520
## 229	1	544.20	27.2100	5.3	571.4100
## 230	0	507.36	25.3680	7.4	532.7280
## 231	1	162.74	8.1370	6.5	170.8770
## 232	2	31.77	1.5885	8.7	33.3585
## 233	1	756.81	37.8405	8.0	794.6505
## 234	1	295.28	14.7640	6.7	310.0440
## 235	0	519.40	25.9700	6.5	545.3700
## 236	0	186.28	9.3140	4.1	195.5940
## 237	2	87.05	4.3525	4.9	91.4025
## 238	2	221.10	11.0550	8.6	232.1550
## 239	1	66.10	3.3050	4.3	69.4050
## 240	0	89.69	4.4845	4.9	94.1745
## 241	2	224.46	11.2230	5.6	235.6830
## 242	2	119.54	5.9770	5.8	125.5170
## 243	2	186.40	9.3200	6.0	195.7200
## 244	1	250.60	12.5300	4.2	263.1300
## 245	2	750.96	37.5480	8.3	788.5080
## 246	1	380.72	19.0360	5.7	399.7560
## 247	1	244.20	12.2100	4.8	256.4100
## 248	0	89.70	4.4850	6.8	94.1850
## 249	2	310.88	15.5440	8.8	326.4240
## 250	2	511.42	25.5710	4.2	536.9910
## 251	0	418.95	20.9475	6.4	439.8975
## 252	2	351.90	17.5950	8.4	369.4950
## 253	2	28.78	1.4390	7.2	30.2190
## 254	1	95.00	4.7500	5.2	99.7500
## 255	1	471.20	23.5600	8.9	494.7600
## 256	1	130.48	6.5240	9.0	137.0040
## 257	2	66.35	3.3175	9.7	69.6675
## 258	0	155.46	7.7730	8.7	163.2330

## 259	0	129.00	6.4500	6.5	135.4500
## 260	2	263.76	13.1880	6.9	276.9480
## 261	0	675.54	33.7770	6.2	709.3170
## 262	0	65.80	3.2900	5.6	69.0900
## 263	1	153.20	7.6600	5.7	160.8600
## 264	1	222.40	11.1200	4.2	233.5200
## 265	0	54.45	2.7225	7.9	57.1725
## 266	2	688.80	34.4400	8.7	723.2400
## 267	2	141.88	7.0940	6.9	148.9740
## 268	1	746.00	37.3000	9.5	783.3000
## 269	2	282.96	14.1480	4.4	297.1080
## 270	0	355.40	17.7700	7.0	373.1700
## 271	0	337.15	16.8575	6.3	354.0075
## 272	1	42.24	2.1120	9.7	44.3520
## 273	2	193.86	9.6930	8.8	203.5530
## 274	1	24.06	1.2030	5.1	25.2630
## 275	0	598.26	29.9130	7.9	628.1730
## 276	1	335.79	16.7895	6.2	352.5795
## 277	1	218.20	10.9100	7.1	229.1100
## 278	0	381.68	19.0840	6.4	400.7640
## 279	1	709.90	35.4950	5.7	745.3950
## 280	2	440.20	22.0100	9.6	462.2100
## 281	2	559.68	27.9840	6.4	587.6640
## 282	2	37.00	1.8500	7.9	38.8500
## 283	1	15.34	0.7670	6.5	16.1070
## 284	0	598.98	29.9490	8.5	628.9290
## 285	1	190.68	9.5340	9.1	200.2140
## 286	1	333.40	16.6700	7.6	350.0700
## 287	1	74.86	3.7430	6.9	78.6030
## 288	1	213.75	10.6875	9.5	224.4375
## 289	2	339.57	16.9785	5.2	356.5485
## 290	1	664.16	33.2080	4.2	697.3680
## 291	2	403.00	20.1500	7.0	423.1500
## 292	0	194.95	9.7475	6.0	204.6975
## 293	1	62.48	3.1240	4.7	65.6040
## 294	1	72.72	3.6360	7.1	76.3560
## 295	0	181.10	9.0550	5.9	190.1550
## 296	1	259.60	12.9800	7.5	272.5800
## 297	1	115.36	5.7680	6.4	121.1280
## 298	0	470.28	23.5140	5.8	493.7940
## 299	1	240.04	12.0020	4.5	252.0420
## 300	1	88.61	4.4305	7.7	93.0405
## 301	2	199.64	9.9820	6.7	209.6220
## 302	2	39.01	1.9505	4.7	40.9605
## 303	1	48.61	2.4305	4.4	51.0405
## 304	2	204.76	10.2380	4.7	214.9980
## 305	1	119.68	5.9840	8.6	125.6640
## 306	0	505.40	25.2700	4.3	530.6700
## 307	1	281.61	14.0805	9.6	295.6905
## 308	1	710.32	35.5160	4.1	745.8360
## 309	0	79.44	3.9720	4.7	83.4120
## 310	1	163.82	8.1910	7.8	172.0110
## 311	1	479.58	23.9790	5.5	503.5590
## 312	0	138.66	6.9330	9.7	145.5930

## 313	2	71.15	3.5575	4.4	74.7075
## 314	1	139.95	6.9975	5.0	146.9475
## 315	1	781.30	39.0650	4.4	820.3650
## 316	1	198.74	9.9370	5.2	208.6770
## 317	1	63.24	3.1620	7.3	66.4020
## 318	1	373.95	18.6975	4.9	392.6475
## 319	2	207.69	10.3845	8.1	218.0745
## 320	0	176.28	8.8140	8.4	185.0940
## 321	1	206.37	10.3185	5.5	216.6885
## 322	1	39.42	1.9710	8.4	41.3910
## 323	0	91.56	4.5780	9.8	96.1380
## 324	1	308.85	15.4425	6.7	324.2925
## 325	2	129.12	6.4560	9.4	135.5760
## 326	0	390.96	19.5480	6.4	410.5080
## 327	1	498.90	24.9450	5.4	523.8450
## 328	1	377.04	18.8520	8.6	395.8920
## 329	2	204.52	10.2260	4.0	214.7460
## 330	1	145.44	7.2720	7.6	152.7120
## 331	1	198.18	9.9090	6.8	208.0890
## 332	2	98.70	4.9350	9.1	103.6350
## 333	1	385.10	19.2550	5.5	404.3550
## 334	2	46.96	2.3480	7.9	49.3080
## 335	0	73.50	3.6750	8.5	77.1750
## 336	2	142.25	7.1125	9.1	149.3625
## 337	0	687.60	34.3800	7.5	721.9800
## 338	1	347.70	17.3850	5.2	365.0850
## 339	2	142.95	7.1475	9.5	150.0975
## 340	2	385.38	19.2690	8.9	404.6490
## 341	2	144.27	7.2135	7.8	151.4835
## 342	0	391.79	19.5895	8.9	411.3795
## 343	1	538.30	26.9150	7.7	565.2150
## 344	0	485.15	24.2575	9.3	509.4075
## 345	1	133.95	6.6975	6.2	140.6475
## 346	0	701.37	35.0685	7.6	736.4385
## 347	1	71.95	3.5975	7.3	75.5475
## 348	1	714.00	35.7000	4.7	749.7000
## 349	1	182.14	9.1070	5.1	191.2470
## 350	2	135.00	6.7500	4.8	141.7500
## 351	2	993.00	49.6500	6.6	1042.6500
## 352	1	361.83	18.0915	5.5	379.9215
## 353	2	383.11	19.1555	8.5	402.2655
## 354	1	243.00	12.1500	4.8	255.1500
## 355	1	30.24	1.5120	8.4	31.7520
## 356	2	356.56	17.8280	7.8	374.3880
## 357	2	375.50	18.7750	9.3	394.2750
## 358	1	954.40	47.7200	5.2	1002.1200
## 359	0	82.50	4.1250	6.5	86.6250
## 360	1	74.97	3.7485	5.6	78.7185
## 361	2	647.68	32.3840	7.4	680.0640
## 362	1	755.76	37.7880	9.1	793.5480
## 363	0	199.58	9.9790	8.0	209.5590
## 364	1	439.32	21.9660	7.2	461.2860
## 365	1	164.96	8.2480	7.1	173.2080
## 366	1	326.72	16.3360	9.1	343.0560

## 367	1	461.88	23.0940	5.6	484.9740
## 368	1	263.76	13.1880	6.0	276.9480
## 369	1	143.60	7.1800	5.4	150.7800
## 370	2	193.50	9.6750	7.8	203.1750
## 371	1	183.82	9.1910	9.9	193.0110
## 372	2	121.92	6.0960	4.9	128.0160
## 373	0	420.66	21.0330	5.2	441.6930
## 374	1	252.48	12.6240	8.9	265.1040
## 375	2	335.45	16.7725	9.1	352.2225
## 376	0	483.50	24.1750	7.0	507.6750
## 377	2	318.42	15.9210	9.6	334.3410
## 378	0	668.43	33.4215	8.7	701.8515
## 379	0	387.92	19.3960	9.4	407.3160
## 380	2	94.60	4.7300	4.0	99.3300
## 381	2	329.32	16.4660	7.5	345.7860
## 382	1	53.22	2.6610	4.2	55.8810
## 383	1	498.45	24.9225	9.9	523.3725
## 384	0	299.56	14.9780	4.2	314.5380
## 385	0	204.70	10.2350	9.9	214.9350
## 386	1	75.82	3.7910	5.8	79.6110
## 387	1	280.62	14.0310	6.0	294.6510
## 388	2	323.20	16.1600	10.0	339.3600
## 389	0	486.63	24.3315	9.5	510.9615
## 390	2	127.54	6.3770	6.6	133.9170
## 391	1	241.44	12.0720	8.1	253.5120
## 392	1	379.50	18.9750	9.7	398.4750
## 393	0	76.82	3.8410	7.2	80.6610
## 394	2	522.60	26.1300	6.2	548.7300
## 395	0	79.74	3.9870	7.3	83.7270
## 396	0	387.50	19.3750	4.3	406.8750
## 397	0	271.35	13.5675	4.6	284.9175
## 398	1	122.31	6.1155	5.8	128.4255
## 399	2	246.36	12.3180	8.3	258.6780
## 400	1	173.16	8.6580	8.0	181.8180
## 401	2	236.58	11.8290	9.4	248.4090
## 402	2	184.88	9.2440	6.2	194.1240
## 403	0	13.98	0.6990	9.8	14.6790
## 404	0	198.75	9.9375	9.6	208.6875
## 405	0	684.53	34.2265	4.9	718.7565
## 406	2	269.04	13.4520	8.0	282.4920
## 407	2	68.95	3.4475	7.8	72.3975
## 408	1	274.84	13.7420	4.1	288.5820
## 409	0	226.12	11.3060	5.5	237.4260
## 410	0	119.10	5.9550	5.4	125.0550
## 411	1	342.10	17.1050	5.1	359.2050
## 412	0	43.74	2.1870	6.9	45.9270
## 413	1	104.85	5.2425	7.8	110.0925
## 414	0	77.52	3.8760	6.6	81.3960
## 415	0	407.44	20.3720	9.2	427.8120
## 416	0	96.11	4.8055	7.8	100.9155
## 417	2	181.52	9.0760	8.7	190.5960
## 418	0	81.51	4.0755	9.2	85.5855
## 419	0	114.44	5.7220	8.3	120.1620
## 420	1	176.54	8.8270	8.2	185.3670

## 421	0	115.80	5.7900	7.5	121.5900
## 422	1	252.15	12.6075	9.8	264.7575
## 423	2	972.10	48.6050	8.7	1020.7050
## 424	2	203.36	10.1680	6.7	213.5280
## 425	1	16.28	0.8140	5.0	17.0940
## 426	1	365.49	18.2745	7.0	383.7645
## 427	1	372.19	18.6095	8.9	390.7995
## 428	2	62.61	3.1305	8.0	65.7405
## 429	1	336.35	16.8175	6.9	353.1675
## 430	0	906.50	45.3250	7.3	951.8250
## 431	2	138.16	6.9080	6.9	145.0680
## 432	0	86.54	4.3270	5.7	90.8670
## 433	0	140.76	7.0380	6.4	147.7980
## 434	2	668.78	33.4390	9.6	702.2190
## 435	2	47.44	2.3720	6.8	49.8120
## 436	0	893.16	44.6580	9.0	937.8180
## 437	0	331.72	16.5860	9.6	348.3060
## 438	2	203.94	10.1970	7.7	214.1370
## 439	0	68.16	3.4080	7.0	71.5680
## 440	2	326.88	16.3440	6.5	343.2240
## 441	1	87.20	4.3600	8.1	91.5600
## 442	2	707.44	35.3720	4.3	742.8120
## 443	2	802.89	40.1445	6.5	843.0345
## 444	0	12.78	0.6390	9.5	13.4190
## 445	1	133.70	6.6850	9.7	140.3850
## 446	2	19.15	0.9575	9.5	20.1075
## 447	2	276.60	13.8300	8.9	290.4300
## 448	2	137.22	6.8610	6.5	144.0810
## 449	2	27.07	1.3535	5.3	28.4235
## 450	2	39.12	1.9560	9.6	41.0760
## 451	1	448.26	22.4130	6.7	470.6730
## 452	1	132.06	6.6030	7.6	138.6630
## 453	0	318.05	15.9025	4.8	333.9525
## 454	0	25.00	1.2500	5.5	26.2500
## 455	1	83.08	4.1540	4.7	87.2340
## 456	1	147.80	7.3900	6.9	155.1900
## 457	2	696.60	34.8300	4.5	731.4300
## 458	1	793.90	39.6950	6.2	833.5950
## 459	1	465.70	23.2850	7.6	488.9850
## 460	2	35.89	1.7945	7.9	37.6845
## 461	1	202.60	10.1300	4.5	212.7300
## 462	2	730.50	36.5250	8.7	767.0250
## 463	1	295.80	14.7900	6.1	310.5900
## 464	1	22.62	1.1310	6.4	23.7510
## 465	2	256.70	12.8350	9.1	269.5350
## 466	2	545.50	27.2750	7.1	572.7750
## 467	2	260.05	13.0025	7.7	273.0525
## 468	1	222.12	11.1060	4.5	233.2260
## 469	0	21.58	1.0790	7.2	22.6590
## 470	1	98.84	4.9420	8.4	103.7820
## 471	0	502.62	25.1310	5.4	527.7510
## 472	1	160.20	8.0100	9.7	168.2100
## 473	2	431.30	21.5650	5.5	452.8650
## 474	1	580.56	29.0280	4.6	609.5880

## 475	1	322.20	16.1100	6.6	338.3100
## 476	2	195.54	9.7770	6.3	205.3170
## 477	2	166.30	8.3150	4.2	174.6150
## 478	0	336.28	16.8140	4.4	353.0940
## 479	0	343.70	17.1850	6.7	360.8850
## 480	0	38.60	1.9300	6.7	40.5300
## 481	1	527.76	26.3880	8.4	554.1480
## 482	1	328.00	16.4000	6.2	344.4000
## 483	0	185.70	9.2850	5.0	194.9850
## 484	1	603.80	30.1900	6.0	633.9900
## 485	2	369.80	18.4900	7.0	388.2900
## 486	0	197.96	9.8980	6.6	207.8580
## 487	1	410.90	20.5450	7.3	431.4450
## 488	0	148.60	7.4300	8.3	156.0300
## 489	1	22.96	1.1480	4.3	24.1080
## 490	0	699.12	34.9560	9.8	734.0760
## 491	0	69.40	3.4700	8.2	72.8700
## 492	2	196.60	9.8300	7.2	206.4300
## 493	0	202.56	10.1280	8.7	212.6880
## 494	2	121.20	6.0600	8.4	127.2600
## 495	0	199.78	9.9890	7.1	209.7690
## 496	1	607.36	30.3680	5.5	637.7280
## 497	1	126.44	6.3220	8.5	132.7620
## 498	1	541.44	27.0720	6.2	568.5120
## 499	1	98.13	4.9065	8.9	103.0365
## 500	1	412.16	20.6080	9.6	432.7680
## 501	2	73.97	3.6985	5.4	77.6685
## 502	0	31.90	1.5950	9.1	33.4950
## 503	0	138.80	6.9400	9.0	145.7400
## 504	1	186.62	9.3310	6.3	195.9510
## 505	2	88.45	4.4225	9.5	92.8725
## 506	0	193.44	9.6720	9.8	203.1120
## 507	1	145.50	7.2750	6.7	152.7750
## 508	2	504.30	25.2150	7.7	529.5150
## 509	1	306.45	15.3225	7.0	321.7725
## 510	2	95.70	4.7850	5.1	100.4850
## 511	2	635.18	31.7590	6.2	666.9390
## 512	0	214.55	10.7275	6.1	225.2775
## 513	0	379.96	18.9980	9.3	398.9580
## 514	1	696.85	34.8425	7.6	731.6925
## 515	2	408.73	20.4365	8.2	429.1665
## 516	0	51.47	2.5735	8.5	54.0435
## 517	0	274.30	13.7150	9.8	288.0150
## 518	2	196.95	9.8475	8.7	206.7975
## 519	0	69.46	3.4730	9.7	72.9330
## 520	2	359.60	17.9800	4.3	377.5800
## 521	2	137.13	6.8565	7.7	143.9865
## 522	1	499.02	24.9510	7.3	523.9710
## 523	2	224.64	11.2320	5.9	235.8720
## 524	1	125.74	6.2870	5.0	132.0270
## 525	2	490.26	24.5130	8.0	514.7730
## 526	0	457.05	22.8525	7.1	479.9025
## 527	2	156.84	7.8420	9.0	164.6820
## 528	0	119.72	5.9860	6.7	125.7060

## 529	2	543.60	27.1800	6.1	570.7800
## 530	1	882.81	44.1405	9.3	926.9505
## 531	0	152.58	7.6290	7.0	160.2090
## 532	2	693.44	34.6720	7.2	728.1120
## 533	0	229.50	11.4750	8.2	240.9750
## 534	0	146.79	7.3395	8.4	154.1295
## 535	0	141.60	7.0800	6.2	148.6800
## 536	0	116.69	5.8345	7.4	122.5245
## 537	2	73.96	3.6980	5.0	77.6580
## 538	0	97.94	4.8970	6.9	102.8370
## 539	2	292.20	14.6100	4.9	306.8100
## 540	0	524.88	26.2440	5.1	551.1240
## 541	0	92.04	4.6020	9.1	96.6420
## 542	2	75.88	3.7940	7.1	79.6740
## 543	2	80.72	4.0360	5.0	84.7560
## 544	2	112.62	5.6310	5.5	118.2510
## 545	2	71.20	3.5600	9.2	74.7600
## 546	0	155.24	7.7620	4.9	163.0020
## 547	0	294.20	14.7100	8.9	308.9100
## 548	2	548.55	27.4275	6.0	575.9775
## 549	1	257.70	12.8850	4.2	270.5850
## 550	1	396.36	19.8180	7.3	416.1780
## 551	0	171.81	8.5905	6.5	180.4005
## 552	1	488.79	24.4395	8.9	513.2295
## 553	1	524.16	26.2080	9.7	550.3680
## 554	2	133.26	6.6630	8.6	139.9230
## 555	1	135.24	6.7620	6.9	142.0020
## 556	2	112.44	5.6220	7.7	118.0620
## 557	1	144.08	7.2040	9.5	151.2840
## 558	0	985.20	49.2600	4.5	1034.4600
## 559	0	249.96	12.4980	5.6	262.4580
## 560	0	217.26	10.8630	8.2	228.1230
## 561	1	194.22	9.7110	7.3	203.9310
## 562	2	892.00	44.6000	4.4	936.6000
## 563	0	339.36	16.9680	5.7	356.3280
## 564	0	447.06	22.3530	5.0	469.4130
## 565	1	198.50	9.9250	9.0	208.4250
## 566	2	812.10	40.6050	6.3	852.7050
## 567	2	493.30	24.6650	9.4	517.9650
## 568	1	591.66	29.5830	7.7	621.2430
## 569	2	559.02	27.9510	5.5	586.9710
## 570	0	517.86	25.8930	4.1	543.7530
## 571	2	410.20	20.5100	7.6	430.7100
## 572	1	266.70	13.3350	8.6	280.0350
## 573	0	70.91	3.5455	8.3	74.4555
## 574	2	144.78	7.2390	8.1	152.0190
## 575	2	429.55	21.4775	8.6	451.0275
## 576	0	569.17	28.4585	6.3	597.6285
## 577	1	241.20	12.0600	5.8	253.2600
## 578	0	127.08	6.3540	6.2	133.4340
## 579	1	257.08	12.8540	7.7	269.9340
## 580	0	139.02	6.9510	8.1	145.9710
## 581	1	81.66	4.0830	7.3	85.7430
## 582	1	310.72	15.5360	8.4	326.2560

## 583	2	185.96	9.2980	8.0	195.2580
## 584	2	72.32	3.6160	9.5	75.9360
## 585	0	189.18	9.4590	7.0	198.6390
## 586	2	206.84	10.3420	9.8	217.1820
## 587	1	157.02	7.8510	9.2	164.8710
## 588	0	215.30	10.7650	7.7	226.0650
## 589	1	596.10	29.8050	5.3	625.9050
## 590	1	73.10	3.6550	4.4	76.7550
## 591	2	279.18	13.9590	4.3	293.1390
## 592	0	169.68	8.4840	9.4	178.1640
## 593	1	45.58	2.2790	9.8	47.8590
## 594	0	225.60	11.2800	4.8	236.8800
## 595	1	290.40	14.5200	5.3	304.9200
## 596	2	44.46	2.2230	8.7	46.6830
## 597	2	156.60	7.8300	9.5	164.4300
## 598	0	419.94	20.9970	5.3	440.9370
## 599	1	184.25	9.2125	9.2	193.4625
## 600	0	140.64	7.0320	9.6	147.6720
## 601	0	83.08	4.1540	6.4	87.2340
## 602	2	64.99	3.2495	4.5	68.2395
## 603	0	775.60	38.7800	6.9	814.3800
## 604	0	327.06	16.3530	7.8	343.4130
## 605	1	363.23	18.1615	4.5	381.3915
## 606	1	127.00	6.3500	8.6	133.3500
## 607	0	375.55	18.7775	5.2	394.3275
## 608	2	199.16	9.9580	6.4	209.1180
## 609	0	30.61	1.5305	5.2	32.1405
## 610	0	115.78	5.7890	8.9	121.5690
## 611	2	28.96	1.4480	6.2	30.4080
## 612	1	890.73	44.5365	6.7	935.2665
## 613	1	279.66	13.9830	7.2	293.6430
## 614	2	80.93	4.0465	9.0	84.9765
## 615	0	674.50	33.7250	4.2	708.2250
## 616	0	348.48	17.4240	4.2	365.9040
## 617	1	435.60	21.7800	6.9	457.3800
## 618	0	439.55	21.9775	4.4	461.5275
## 619	2	591.18	29.5590	4.0	620.7390
## 620	0	260.76	13.0380	8.5	273.7980
## 621	2	215.04	10.7520	9.2	225.7920
## 622	1	91.61	4.5805	9.8	96.1905
## 623	2	662.13	33.1065	4.9	695.2365
## 624	2	832.50	41.6250	4.4	874.1250
## 625	1	91.35	4.5675	6.8	95.9175
## 626	1	157.76	7.8880	9.1	165.6480
## 627	0	121.74	6.0870	8.7	127.8270
## 628	1	825.80	41.2900	5.0	867.0900
## 629	0	159.90	7.9950	7.5	167.8950
## 630	2	12.09	0.6045	8.2	12.6945
## 631	2	641.90	32.0950	6.7	673.9950
## 632	0	234.93	11.7465	5.4	246.6765
## 633	2	167.54	8.3770	7.0	175.9170
## 634	0	299.10	14.9550	4.7	314.0550
## 635	2	239.73	11.9865	5.0	251.7165
## 636	2	664.70	33.2350	5.0	697.9350

## 637	2	202.65	10.1325	6.0	212.7825
## 638	1	46.20	2.3100	6.3	48.5100
## 639	1	88.15	4.4075	8.5	92.5575
## 640	0	157.26	7.8630	7.5	165.1230
## 641	0	296.37	14.8185	6.4	311.1885
## 642	0	708.40	35.4200	4.7	743.8200
## 643	0	111.34	5.5670	6.0	116.9070
## 644	2	580.16	29.0080	4.0	609.1680
## 645	0	60.25	3.0125	5.5	63.2625
## 646	0	174.24	8.7120	8.7	182.9520
## 647	1	421.26	21.0630	7.4	442.3230
## 648	1	33.63	1.6815	5.6	35.3115
## 649	1	30.98	1.5490	6.3	32.5290
## 650	1	247.40	12.3700	7.1	259.7700
## 651	0	378.30	18.9150	7.8	397.2150
## 652	1	334.86	16.7430	9.9	351.6030
## 653	1	727.80	36.3900	7.3	764.1900
## 654	0	335.88	16.7940	5.1	352.6740
## 655	2	240.72	12.0360	9.4	252.7560
## 656	2	47.07	2.3535	5.8	49.4235
## 657	2	99.69	4.9845	8.0	104.6745
## 658	0	264.45	13.2225	7.9	277.6725
## 659	1	139.65	6.9825	5.9	146.6325
## 660	2	55.45	2.7725	4.9	58.2225
## 661	1	128.91	6.4455	9.3	135.3555
## 662	2	119.98	5.9990	7.9	125.9790
## 663	2	352.50	17.6250	5.9	370.1250
## 664	2	871.00	43.5500	9.9	914.5500
## 665	1	197.60	9.8800	7.7	207.4800
## 666	0	194.52	9.7260	7.6	204.2460
## 667	0	173.22	8.6610	7.7	181.8810
## 668	0	71.88	3.5940	6.4	75.4740
## 669	0	286.26	14.3130	4.4	300.5730
## 670	2	81.24	4.0620	4.1	85.3020
## 671	0	560.40	28.0200	4.4	588.4200
## 672	1	186.80	9.3400	5.5	196.1400
## 673	0	220.23	11.0115	4.0	231.2415
## 674	2	269.12	13.4560	9.3	282.5760
## 675	2	454.80	22.7400	4.8	477.5400
## 676	1	167.54	8.3770	4.6	175.9170
## 677	2	448.56	22.4280	7.3	470.9880
## 678	1	293.88	14.6940	6.0	308.5740
## 679	0	589.50	29.4750	8.1	618.9750
## 680	0	291.00	14.5500	9.4	305.5500
## 681	1	39.48	1.9740	6.5	41.4540
## 682	2	34.81	1.7405	7.0	36.5505
## 683	0	295.92	14.7960	7.1	310.7160
## 684	0	42.96	2.1480	6.6	45.1080
## 685	0	138.48	6.9240	4.9	145.4040
## 686	2	98.20	4.9100	6.4	103.1100
## 687	2	129.66	6.4830	8.0	136.1430
## 688	1	635.60	31.7800	4.3	667.3800
## 689	1	145.76	7.2880	6.1	153.0480
## 690	1	201.30	10.0650	7.5	211.3650

## 691	1	631.71	31.5855	6.7	663.2955
## 692	0	385.28	19.2640	5.2	404.5440
## 693	1	486.30	24.3150	8.8	510.6150
## 694	1	513.66	25.6830	9.5	539.3430
## 695	1	473.40	23.6700	7.6	497.0700
## 696	1	436.85	21.8425	6.6	458.6925
## 697	0	108.16	5.4080	6.9	113.5680
## 698	0	248.76	12.4380	4.3	261.1980
## 699	2	626.22	31.3110	7.8	657.5310
## 700	0	975.00	48.7500	8.0	1023.7500
## 701	0	483.28	24.1640	9.6	507.4440
## 702	2	96.96	4.8480	4.3	101.8080
## 703	2	197.70	9.8850	5.0	207.5850
## 704	1	724.23	36.2115	9.2	760.4415
## 705	1	795.51	39.7755	6.3	835.2855
## 706	1	502.39	25.1195	8.9	527.5095
## 707	0	172.00	8.6000	7.6	180.6000
## 708	1	68.98	3.4490	4.8	72.4290
## 709	0	124.96	6.2480	9.1	131.2080
## 710	0	77.10	3.8550	6.1	80.9550
## 711	1	483.72	24.1860	9.1	507.9060
## 712	0	302.12	15.1060	8.3	317.2260
## 713	0	698.67	34.9335	7.2	733.6035
## 714	0	124.65	6.2325	6.0	130.8825
## 715	0	789.60	39.4800	8.5	829.0800
## 716	2	178.40	8.9200	6.6	187.3200
## 717	0	500.22	25.0110	4.5	525.2310
## 718	2	35.82	1.7910	8.1	37.6110
## 719	2	136.14	6.8070	7.2	142.9470
## 720	2	104.88	5.2440	6.1	110.1240
## 721	1	178.92	8.9460	7.1	187.8660
## 722	1	815.67	40.7835	5.1	856.4535
## 723	2	132.36	6.6180	7.9	138.9780
## 724	1	257.39	12.8695	7.4	270.2595
## 725	0	93.36	4.6680	7.4	98.0280
## 726	1	228.00	11.4000	6.6	239.4000
## 727	2	166.71	8.3355	5.9	175.0455
## 728	2	697.40	34.8700	8.9	732.2700
## 729	0	389.04	19.4520	6.8	408.4920
## 730	1	365.26	18.2630	9.3	383.5230
## 731	2	89.28	4.4640	4.4	93.7440
## 732	0	168.00	8.4000	4.8	176.4000
## 733	0	19.70	0.9850	9.5	20.6850
## 734	0	531.16	26.5580	8.9	557.7180
## 735	0	53.72	2.6860	6.4	56.4060
## 736	2	819.50	40.9750	6.0	860.4750
## 737	2	568.40	28.4200	8.1	596.8200
## 738	0	587.60	29.3800	9.0	616.9800
## 739	0	732.48	36.6240	6.0	769.1040
## 740	1	845.64	42.2820	9.8	887.9220
## 741	1	389.27	19.4635	8.5	408.7335
## 742	0	84.83	4.2415	8.8	89.0715
## 743	0	143.26	7.1630	8.8	150.4230
## 744	0	75.38	3.7690	9.5	79.1490

## 745	2	253.36	12.6680	5.6	266.0280
## 746	1	38.42	1.9210	8.6	40.3410
## 747	2	652.30	32.6150	5.2	684.9150
## 748	2	52.65	2.6325	5.8	55.2825
## 749	2	110.61	5.5305	8.0	116.1405
## 750	1	568.61	28.4305	9.0	597.0405
## 751	0	89.28	4.4640	4.1	93.7440
## 752	2	136.40	6.8200	8.6	143.2200
## 753	0	174.20	8.7100	7.0	182.9100
## 754	0	366.40	18.3200	8.4	384.7200
## 755	0	254.61	12.7305	7.4	267.3405
## 756	2	778.32	38.9160	6.2	817.2360
## 757	0	285.92	14.2960	4.9	300.2160
## 758	1	579.12	28.9560	4.5	608.0760
## 759	0	188.50	9.4250	5.6	197.9250
## 760	0	221.56	11.0780	8.0	232.6380
## 761	2	772.00	38.6000	5.6	810.6000
## 762	2	721.30	36.0650	4.2	757.3650
## 763	0	511.04	25.5520	9.9	536.5920
## 764	0	53.45	2.6725	7.6	56.1225
## 765	2	222.00	11.1000	6.6	233.1000
## 766	0	763.68	38.1840	4.7	801.8640
## 767	2	228.18	11.4090	9.8	239.5890
## 768	1	82.14	4.1070	6.3	86.2470
## 769	1	382.56	19.1280	7.9	401.6880
## 770	1	68.58	3.4290	7.7	72.0090
## 771	0	382.16	19.1080	4.5	401.2680
## 772	2	601.09	30.0545	8.0	631.1445
## 773	0	475.93	23.7965	5.7	499.7265
## 774	2	52.42	2.6210	6.3	55.0410
## 775	1	131.30	6.5650	6.0	137.8650
## 776	2	144.30	7.2150	8.0	151.5150
## 777	2	457.17	22.8585	4.2	480.0285
## 778	1	93.38	4.6690	9.6	98.0490
## 779	1	126.25	6.3125	6.1	132.5625
## 780	0	790.83	39.5415	5.6	830.3715
## 781	1	174.40	8.7200	8.3	183.1200
## 782	0	379.04	18.9520	7.8	397.9920
## 783	2	30.62	1.5310	4.1	32.1510
## 784	1	352.08	17.6040	8.8	369.6840
## 785	0	50.80	2.5400	4.1	53.3400
## 786	2	522.06	26.1030	9.0	548.1630
## 787	0	575.12	28.7560	5.5	603.8760
## 788	2	54.95	2.7475	9.3	57.6975
## 789	2	181.41	9.0705	5.6	190.4805
## 790	0	412.37	20.6185	9.7	432.9885
## 791	2	46.41	2.3205	4.0	48.7305
## 792	2	274.20	13.7100	9.2	287.9100
## 793	2	973.70	48.6850	4.9	1022.3850
## 794	2	648.20	32.4100	9.3	680.6100
## 795	2	93.22	4.6610	6.6	97.8810
## 796	0	54.36	2.7180	4.3	57.0780
## 797	1	60.87	3.0435	5.5	63.9135
## 798	1	244.90	12.2450	8.1	257.1450

## 799	2	92.78	4.6390	9.8	97.4190
## 800	0	433.45	21.6725	9.4	455.1225
## 801	0	138.06	6.9030	7.9	144.9630
## 802	0	241.60	12.0800	5.1	253.6800
## 803	0	471.73	23.5865	6.9	495.3165
## 804	1	440.64	22.0320	8.0	462.6720
## 805	1	680.31	34.0155	8.0	714.3255
## 806	1	309.88	15.4940	4.2	325.3740
## 807	2	186.36	9.3180	8.5	195.6780
## 808	1	200.92	10.0460	9.0	210.9660
## 809	1	17.75	0.8875	8.6	18.6375
## 810	0	621.80	31.0900	6.0	652.8900
## 811	0	86.00	4.3000	6.2	90.3000
## 812	2	402.60	20.1300	5.0	422.7300
## 813	2	324.85	16.2425	6.5	341.0925
## 814	1	95.15	4.7575	6.0	99.9075
## 815	1	388.96	19.4480	5.0	408.4080
## 816	0	425.68	21.2840	5.0	446.9640
## 817	1	318.08	15.9040	9.2	333.9840
## 818	0	271.04	13.5520	9.6	284.5920
## 819	2	384.64	19.2320	8.4	403.8720
## 820	2	235.80	11.7900	6.0	247.5900
## 821	0	211.56	10.5780	6.7	222.1380
## 822	2	95.36	4.7680	4.1	100.1280
## 823	1	10.17	0.5085	5.9	10.6785
## 824	1	206.13	10.3065	8.7	216.4365
## 825	2	420.56	21.0280	4.5	441.5880
## 826	2	88.04	4.4020	6.6	92.4420
## 827	2	648.99	32.4495	7.7	681.4395
## 828	2	123.84	6.1920	8.5	130.0320
## 829	1	649.50	32.4750	5.2	681.9750
## 830	2	742.20	37.1100	4.3	779.3100
## 831	1	84.48	4.2240	7.6	88.7040
## 832	1	250.28	12.5140	9.5	262.7940
## 833	1	94.80	4.7400	4.1	99.5400
## 834	0	91.30	4.5650	9.2	95.8650
## 835	0	285.11	14.2555	5.4	299.3655
## 836	1	52.38	2.6190	5.8	54.9990
## 837	0	192.70	9.6350	5.6	202.3350
## 838	2	267.78	13.3890	5.1	281.1690
## 839	1	558.70	27.9350	5.8	586.6350
## 840	0	175.32	8.7660	5.0	184.0860
## 841	1	155.82	7.7910	7.9	163.6110
## 842	1	60.30	3.0150	6.0	63.3150
## 843	2	78.94	3.9470	5.0	82.8870
## 844	2	29.74	1.4870	8.9	31.2270
## 845	1	21.32	1.0660	5.9	22.3860
## 846	2	281.34	14.0670	5.9	295.4070
## 847	0	73.26	3.6630	9.7	76.9230
## 848	2	22.38	1.1190	8.6	23.4990
## 849	1	655.92	32.7960	4.0	688.7160
## 850	1	594.60	29.7300	4.2	624.3300
## 851	1	74.10	3.7050	9.2	77.8050
## 852	0	196.96	9.8480	9.2	206.8080

## 853	0	372.33	18.6165	5.0	390.9465
## 854	0	527.90	26.3950	10.0	554.2950
## 855	0	479.75	23.9875	8.8	503.7375
## 856	1	328.59	16.4295	4.2	345.0195
## 857	1	168.96	8.4480	6.3	177.4080
## 858	1	113.24	5.6620	8.2	118.9020
## 859	1	345.54	17.2770	5.1	362.8170
## 860	1	428.67	21.4335	5.0	450.1035
## 861	0	86.27	4.3135	7.0	90.5835
## 862	0	25.52	1.2760	7.8	26.7960
## 863	2	101.52	5.0760	4.3	106.5960
## 864	1	357.49	17.8745	7.0	375.3645
## 865	1	238.77	11.9385	6.6	250.7085
## 866	0	101.43	5.0715	7.3	106.5015
## 867	2	724.24	36.2120	6.5	760.4520
## 868	0	125.64	6.2820	4.9	131.9220
## 869	2	72.93	3.6465	4.3	76.5765
## 870	0	258.36	12.9180	9.3	271.2780
## 871	2	173.74	8.6870	7.1	182.4270
## 872	0	56.50	2.8250	9.6	59.3250
## 873	1	214.30	10.7150	6.2	225.0150
## 874	1	534.36	26.7180	9.9	561.0780
## 875	2	93.16	4.6580	5.9	97.8180
## 876	0	522.08	26.1040	6.3	548.1840
## 877	1	52.35	2.6175	4.0	54.9675
## 878	1	39.75	1.9875	6.1	41.7375
## 879	2	720.16	36.0080	4.5	756.1680
## 880	0	96.80	4.8400	8.6	101.6400
## 881	0	332.10	16.6050	6.0	348.7050
## 882	2	81.44	4.0720	9.5	85.5120
## 883	2	319.90	15.9950	9.9	335.8950
## 884	0	206.52	10.3260	7.5	216.8460
## 885	1	166.68	8.3340	7.6	175.0140
## 886	1	319.06	15.9530	5.0	335.0130
## 887	0	87.90	4.3950	6.7	92.2950
## 888	0	734.70	36.7350	9.5	771.4350
## 889	0	97.52	4.8760	6.8	102.3960
## 890	0	769.20	38.4600	5.6	807.6600
## 891	1	418.30	20.9150	7.2	439.2150
## 892	1	463.28	23.1640	8.1	486.4440
## 893	2	462.45	23.1225	8.6	485.5725
## 894	1	141.90	7.0950	9.4	148.9950
## 895	2	302.70	15.1350	8.9	317.8350
## 896	2	793.28	39.6640	4.2	832.9440
## 897	0	425.18	21.2590	5.0	446.4390
## 898	1	283.62	14.1810	8.8	297.8010
## 899	1	599.20	29.9600	5.3	629.1600
## 900	0	315.36	15.7680	4.6	331.1280
## 901	2	403.56	20.1780	7.5	423.7380
## 902	0	183.88	9.1940	5.1	193.0740
## 903	2	138.65	6.9325	4.2	145.5825
## 904	1	80.71	4.0355	8.1	84.7455
## 905	0	116.64	5.8320	6.0	122.4720
## 906	1	313.52	15.6760	7.9	329.1960

## 907	2 846.10	42.3050	8.8	888.4050
## 908	2 414.40	20.7200	6.6	435.1200
## 909	0 159.08	7.9540	6.2	167.0340
## 910	2 490.10	24.5050	4.2	514.6050
## 911	2 87.45	4.3725	7.3	91.8225
## 912	0 224.52	11.2260	8.6	235.7460
## 913	1 744.96	37.2480	6.8	782.2080
## 914	0 410.72	20.5360	7.6	431.2560
## 915	1 298.80	14.9400	5.8	313.7400
## 916	1 212.94	10.6470	4.1	223.5870
## 917	2 42.85	2.1425	9.3	44.9925
## 918	1 378.68	18.9340	6.8	397.6140
## 919	0 206.91	10.3455	8.7	217.2555
## 920	0 78.78	3.9390	6.3	82.7190
## 921	2 322.11	16.1055	5.1	338.2155
## 922	1 98.22	4.9110	7.0	103.1310
## 923	2 25.46	1.2730	5.2	26.7330
## 924	2 581.98	29.0990	6.6	611.0790
## 925	0 211.32	10.5660	6.5	221.8860
## 926	0 55.12	2.7560	9.0	57.8760
## 927	2 88.31	4.4155	5.2	92.7255
## 928	2 356.58	17.8290	6.8	374.4090
## 929	2 794.25	39.7125	7.6	833.9625
## 930	0 50.62	2.5310	7.2	53.1510
## 931	0 599.52	29.9760	7.1	629.4960
## 932	2 166.70	8.3350	9.5	175.0350
## 933	0 744.40	37.2200	5.1	781.6200
## 934	0 448.56	22.4280	7.6	470.9880
## 935	0 378.90	18.9450	9.8	397.8450
## 936	0 257.16	12.8580	5.1	270.0180
## 937	0 552.23	27.6115	7.5	579.8415
## 938	1 447.40	22.3700	7.4	469.7700
## 939	1 276.27	13.8135	4.2	290.0835
## 940	0 343.74	17.1870	5.9	360.9270
## 941	0 266.08	13.3040	6.9	279.3840
## 942	1 898.38	44.9190	6.6	943.2990
## 943	0 456.80	22.8400	5.7	479.6400
## 944	2 253.95	12.6975	5.3	266.6475
## 945	1 70.56	3.5280	4.2	74.0880
## 946	2 657.16	32.8580	7.3	690.0180
## 947	2 168.50	8.4250	5.3	176.9250
## 948	0 53.78	2.6890	4.7	56.4690
## 949	0 179.05	8.9525	7.9	188.0025
## 950	0 211.44	10.5720	8.9	222.0120
## 951	0 119.73	5.9865	9.3	125.7165
## 952	0 65.70	3.2850	4.7	68.9850
## 953	0 251.40	12.5700	8.7	263.9700
## 954	1 84.16	4.2080	7.6	88.3680
## 955	1 395.46	19.7730	5.7	415.2330
## 956	1 297.99	14.8995	6.8	312.8895
## 957	1 454.41	22.7205	5.4	477.1305
## 958	1 276.12	13.8060	7.1	289.9260
## 959	1 158.00	7.9000	7.8	165.9000
## 960	1 887.94	44.3970	8.4	932.3370

## 961	1	91.98	4.5990	9.8	96.5790
## 962	1	41.78	2.0890	9.8	43.8690
## 963	2	15.50	0.7750	7.4	16.2750
## 964	1	290.46	14.5230	6.7	304.9830
## 965	2	66.66	3.3330	6.4	69.9930
## 966	2	76.54	3.8270	5.8	80.3670
## 967	0	299.70	14.9850	7.2	314.6850
## 968	2	243.03	12.1515	9.3	255.1815
## 969	1	47.40	2.3700	9.5	49.7700
## 970	2	172.45	8.6225	9.0	181.0725
## 971	2	846.30	42.3150	9.0	888.6150
## 972	0	258.37	12.9185	6.7	271.2885
## 973	1	609.56	30.4780	5.5	640.0380
## 974	1	240.24	12.0120	5.4	252.2520
## 975	1	172.26	8.6130	8.2	180.8730
## 976	2	99.84	4.9920	7.0	104.8320
## 977	1	298.64	14.9320	8.5	313.5720
## 978	0	159.60	7.9800	4.9	167.5800
## 979	2	25.45	1.2725	5.1	26.7225
## 980	2	67.77	3.3885	6.5	71.1585
## 981	1	238.36	11.9180	9.8	250.2780
## 982	1	232.60	11.6300	8.4	244.2300
## 983	0	877.32	43.8660	7.4	921.1860
## 984	1	699.72	34.9860	6.1	734.7060
## 985	1	674.59	33.7295	6.0	708.3195
## 986	0	318.55	15.9275	8.5	334.4775
## 987	0	29.52	1.4760	4.3	30.9960
## 988	2	496.00	24.8000	6.2	520.8000
## 989	0	823.40	41.1700	4.3	864.5700
## 990	2	602.96	30.1480	8.4	633.1080
## 991	2	282.80	14.1400	4.5	296.9400
## 992	0	766.00	38.3000	6.0	804.3000
## 993	0	116.06	5.8030	8.8	121.8630
## 994	0	174.90	8.7450	6.6	183.6450
## 995	0	60.95	3.0475	5.9	63.9975
## 996	0	40.35	2.0175	6.2	42.3675
## 997	0	973.80	48.6900	4.4	1022.4900
## 998	1	31.84	1.5920	7.7	33.4320
## 999	1	65.82	3.2910	4.1	69.1110
## 1000	1	618.38	30.9190	6.6	649.2990

```

#Changing the factor columns to numeric
feature$Branch <- factor(feature$Branch)
feature$Branch <- as.numeric(feature$Branch)

feature$Customer.type <- factor(feature$Customer.type)
feature$Customer.type <- as.numeric(feature$Customer.type)

feature$Gender <- factor(feature$Gender)
feature$Gender <- as.numeric(feature$Gender)

feature$Product.line <- factor(feature$Product.line)
feature$Product.line <- as.numeric(feature$Product.line)

```

```
feature$Payment <- factor(feature$Payment)
feature$Payment <- as.numeric(feature$Payment)
```

```
# previewing our datatypes
head(feature)
```

```
##   Branch Customer.type Gender Product.line Unit.price Quantity    Tax Payment
## 1      1             1      1           1      74.69         7 26.1415      1
## 2      3             2      1           2      15.28         5  3.8200      2
## 3      1             2      2           3      46.33         7 16.2155      3
## 4      1             1      2           1      58.22         8 23.2880      1
## 5      1             2      2           4      86.31         7 30.2085      1
## 6      3             2      2           2      85.39         7 29.8865      1
##   cogs gross.income Rating    Total
## 1 522.83      26.1415   9.1 548.9715
## 2  76.40       3.8200   9.6  80.2200
## 3 324.31      16.2155   7.4 340.5255
## 4 465.76      23.2880   8.4 489.0480
## 5 604.17      30.2085   5.3 634.3785
## 6 597.73      29.8865   4.1 627.6165
```

```
# calculating the correlation matrix
correlationMatrix <- cor(feature)
```

```
# identifying highly correlated attributes
#
highlyCorrelated <- findCorrelation(correlationMatrix, cutoff=0.75)
highlyCorrelated
```

```
## [1]  9 12  7
```

```
names(feature[,highlyCorrelated])
```

```
## [1] "cogs" "Total" "Tax"
```

3 variables are strongly correlated thus we will drop them

```
# removing strongly correlated variables
feature_clean <- feature[-highlyCorrelated]
head(feature_clean)
```

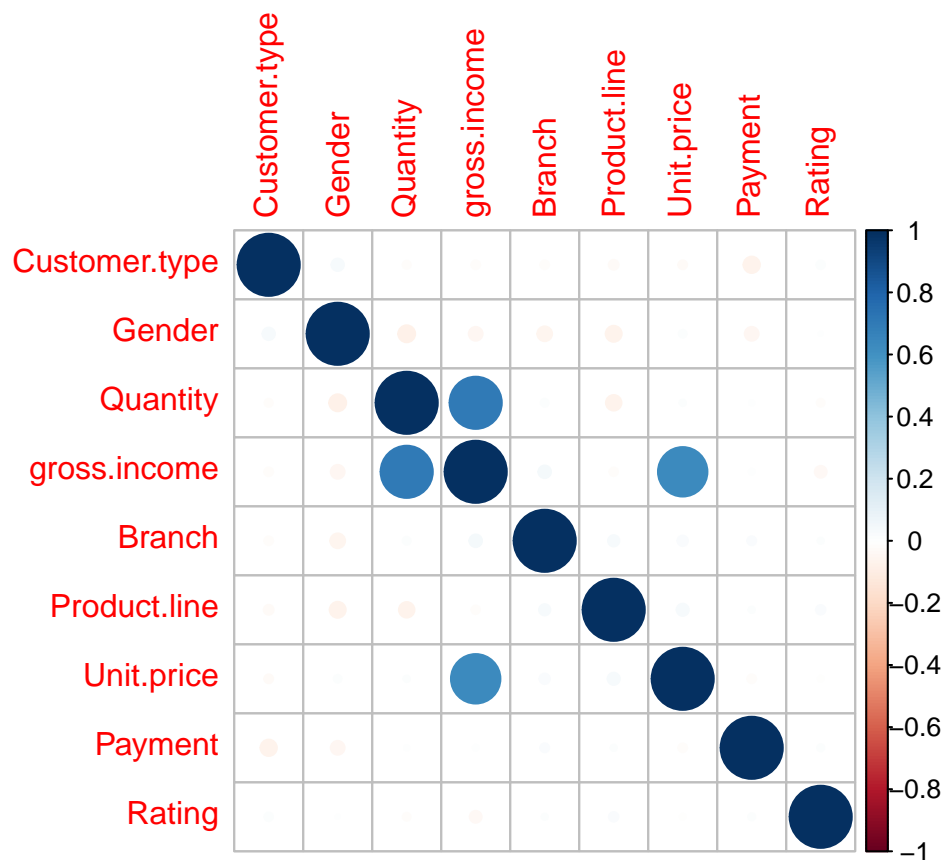
```
##   Branch Customer.type Gender Product.line Unit.price Quantity Payment
## 1      1             1      1           1      74.69         7      1
## 2      3             2      1           2      15.28         5      2
## 3      1             2      2           3      46.33         7      3
## 4      1             1      2           1      58.22         8      1
## 5      1             2      2           4      86.31         7      1
## 6      3             2      2           2      85.39         7      1
##   gross.income Rating
## 1      26.1415   9.1
```

```
## 2      3.8200    9.6
## 3     16.2155    7.4
## 4     23.2880    8.4
## 5     30.2085    5.3
## 6     29.8865    4.1
```

```
# library
library(corrplot)
```

```
## corrplot 0.92 loaded
```

```
# checking correlation after cleaning
corrplot(cor(feature_clean), order = 'hclust')
```



The correlation shows variables with high enough significance levels.

wrapper method

```
# import library
library(clustvarsel)
```

```
## Loading required package: mclust
```

```
## Package 'mclust' version 5.4.10
## Type 'citation("mclust")' for citing this R package in publications.

## Package 'clustvarsel' version 2.3.4

## Type 'citation("clustvarsel")' for citing this R package in publications.
```

```
#greedy search
greedy = clustvarsel(feature, G = 1:5)
greedy
```

```
## -----
## Variable selection for Gaussian model-based clustering
## Stepwise (forward/backward) greedy search
## -----
##
## Variable proposed Type of step BICclust Model G BICdiff Decision
## Tax Add -7382.354 V 4 389.0238 Accepted
## gross.income Add 55117.386 VEV 3 2502.9883 Accepted
## Quantity Add -16164.602 VVI 5 -66967.5199 Rejected
## Tax Remove -7392.222 V 3 2512.8564 Rejected
##
## Selected subset: Tax, gross.income
```

For the model, shall use the Tax and gross income since the algorithm has selected them

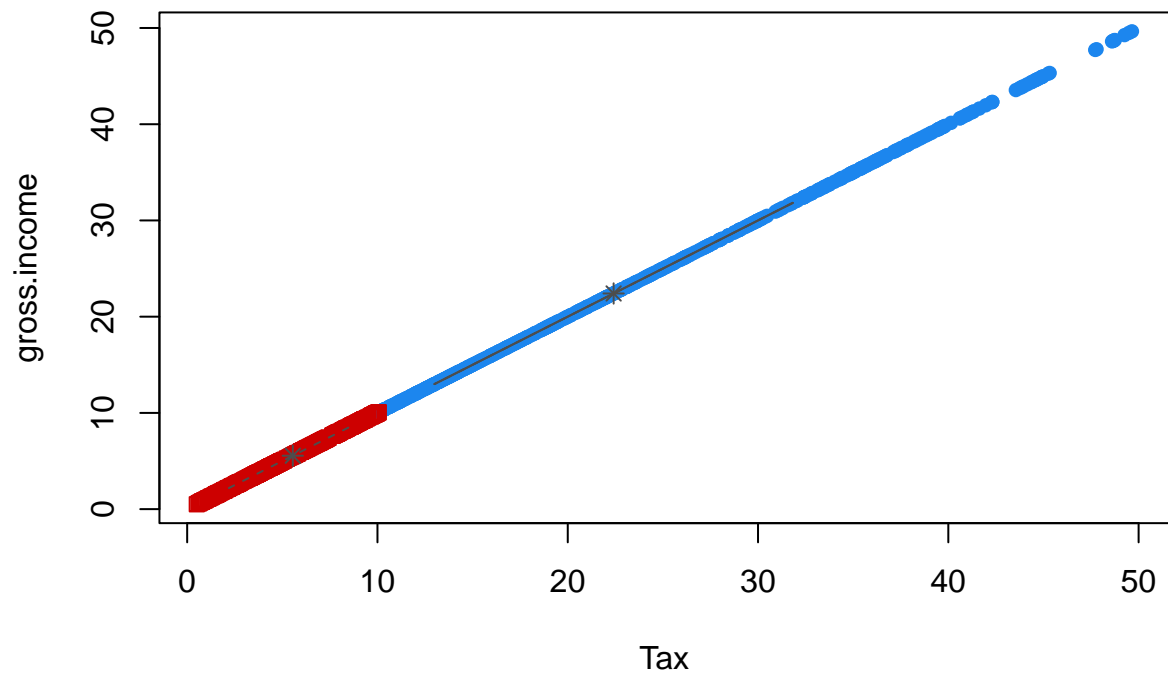
```
Subset1 = feature[,greedy$subset]
model = Mclust(Subset1, G = 1:5)
summary(model)
```

```
## -----
## Gaussian finite mixture model fitted by EM algorithm
## -----
##
## Mclust VEV (ellipsoidal, equal shape) model with 2 components:
##
## log-likelihood n df BIC ICL
## 27364.17 1000 10 54659.26 54524.45
##
## Clustering table:
## 1 2
## 564 436
```

The model has selected 2 clusters. 1 with 564 and 2 with 436

```
# plotting the model
plot(model,c("classification"))
```

```
## Warning in sqrt(rev(sort(ev$values))): NaNs produced
```



since the model has been able to pick and compare the variables well, it can be considered a success.

Conclusion

From our analysis we can say that the most contributing feature were gross income, tax and quantity