Lab 9

Jia Yu Lin

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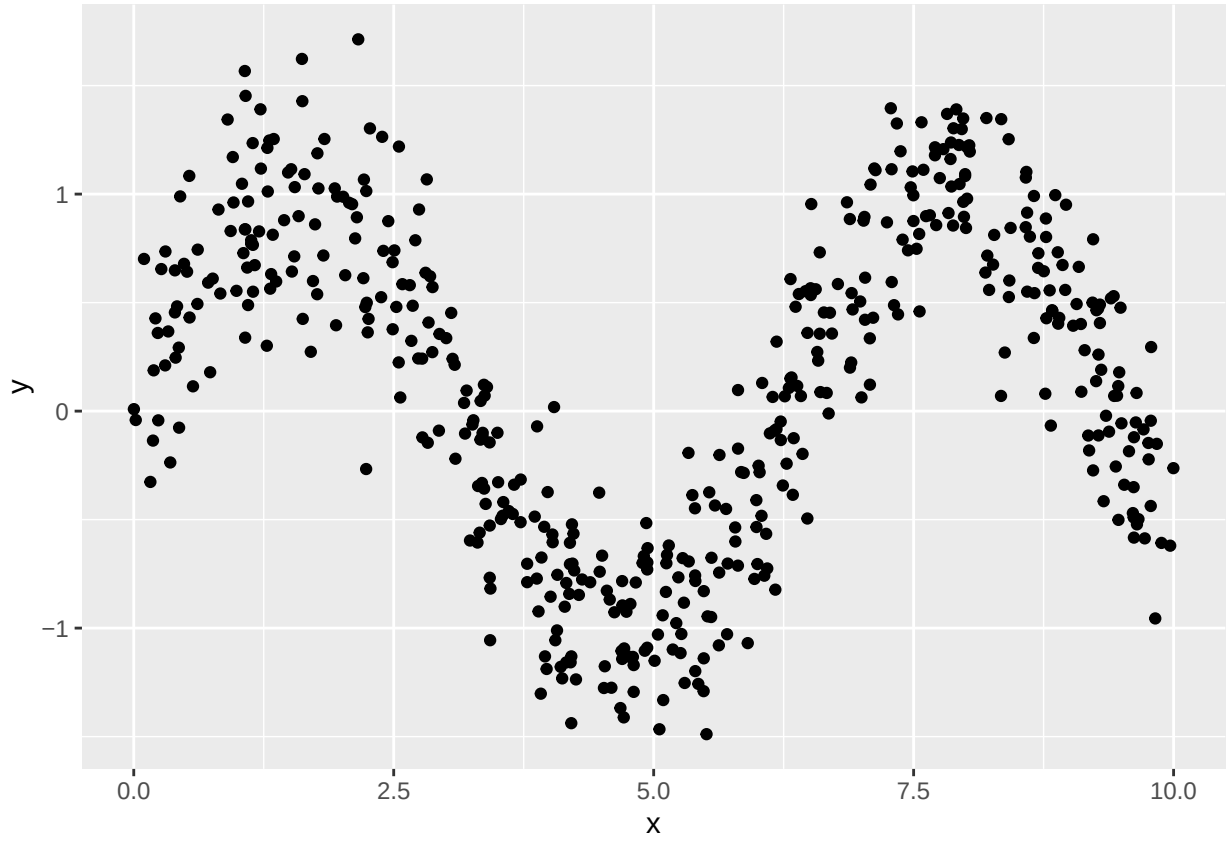
Here we will learn about trees, bagged trees and random forests. You can use the `YARF` package if it works, otherwise, use the `randomForest` package (the standard).

Let's take a look at the simulated sine curve data from practice lecture 12. Below is the code for the data generating process:

```
rm(list = ls())
n = 500
sigma = 0.3
x_min = 0
x_max = 10
f_x = function(x){sin(x)}
y_x = function(x, sigma){f_x(x) + rnorm(n, 0, sigma)}
x_train = runif(n, x_min, x_max)
y_train = y_x(x_train, sigma)
```

Plot an example dataset of size 500:

```
pacman::p_load(ggplot2)
ggplot(data.frame(x = x_train, y = y_train))+
  geom_point(aes(x = x, y = y))
```



Create a test set of size 500 as well

```
x_test = runif(n,x_min, x_max)
y_test = y_x(x_test, sigma)
```

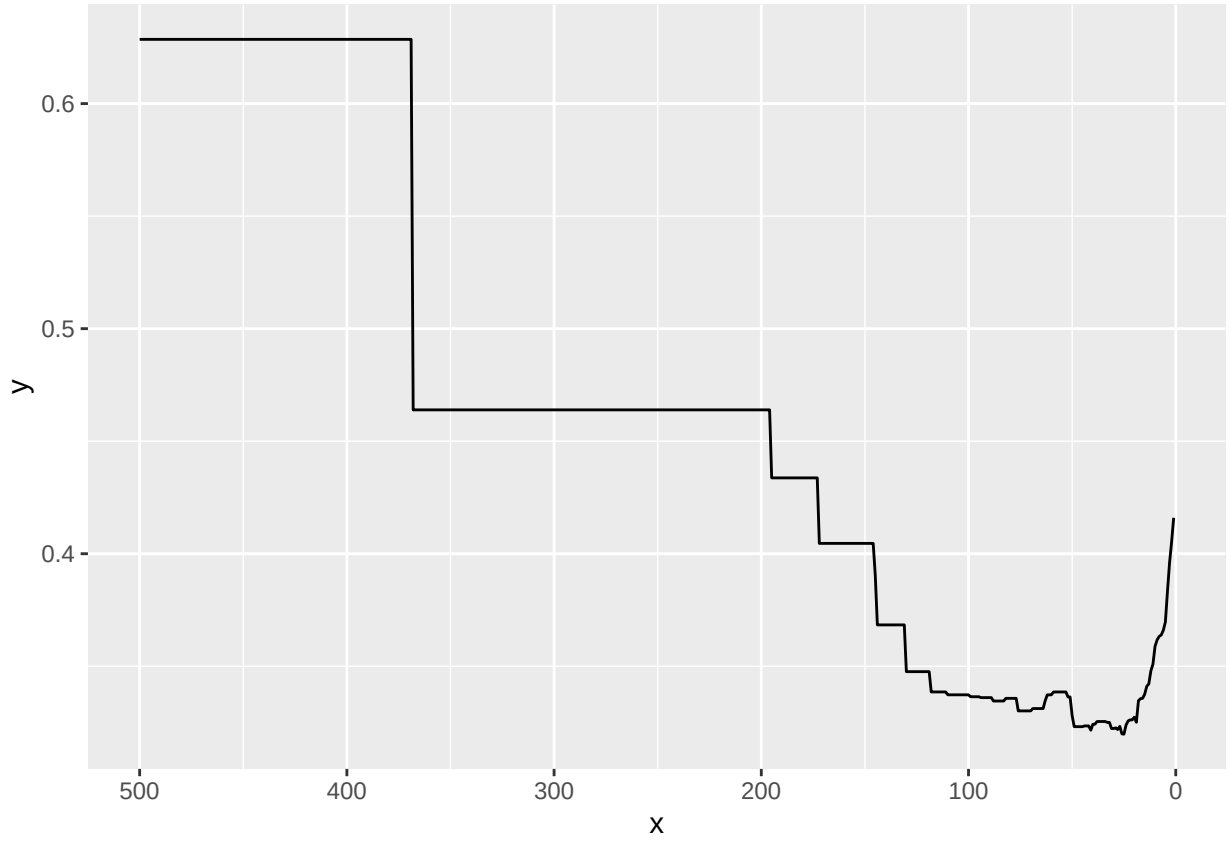
Locate the optimal node size hyperparameter for the regression tree model. I believe you can use `randomForest` here by setting `ntree = 1`, `replace = FALSE`, `sampsize = n` (`mtry` is already set to be 1 because there is only one feature) and then you can set `nodesize`. Plot node size by out of sample SE.

```
pacman::p_load(randomForest)

node_sizes = 1:n
se_by_node_sizes = array(NA, length(node_sizes))

for( i in 1:length(node_sizes)){
  rf_mod = randomForest(x = data.frame( x = x_train), y = y_train, ntree = 1, replace = FALSE, sampsize
  y_hat_test = predict(rf_mod, data.frame(x = x_test))
  se_by_node_sizes[i] = sd(y_test - y_hat_test)
}

ggplot(data.frame(x = node_sizes, y = se_by_node_sizes)) +
  geom_line(aes(x = x, y = y)) +
  scale_x_reverse()
```



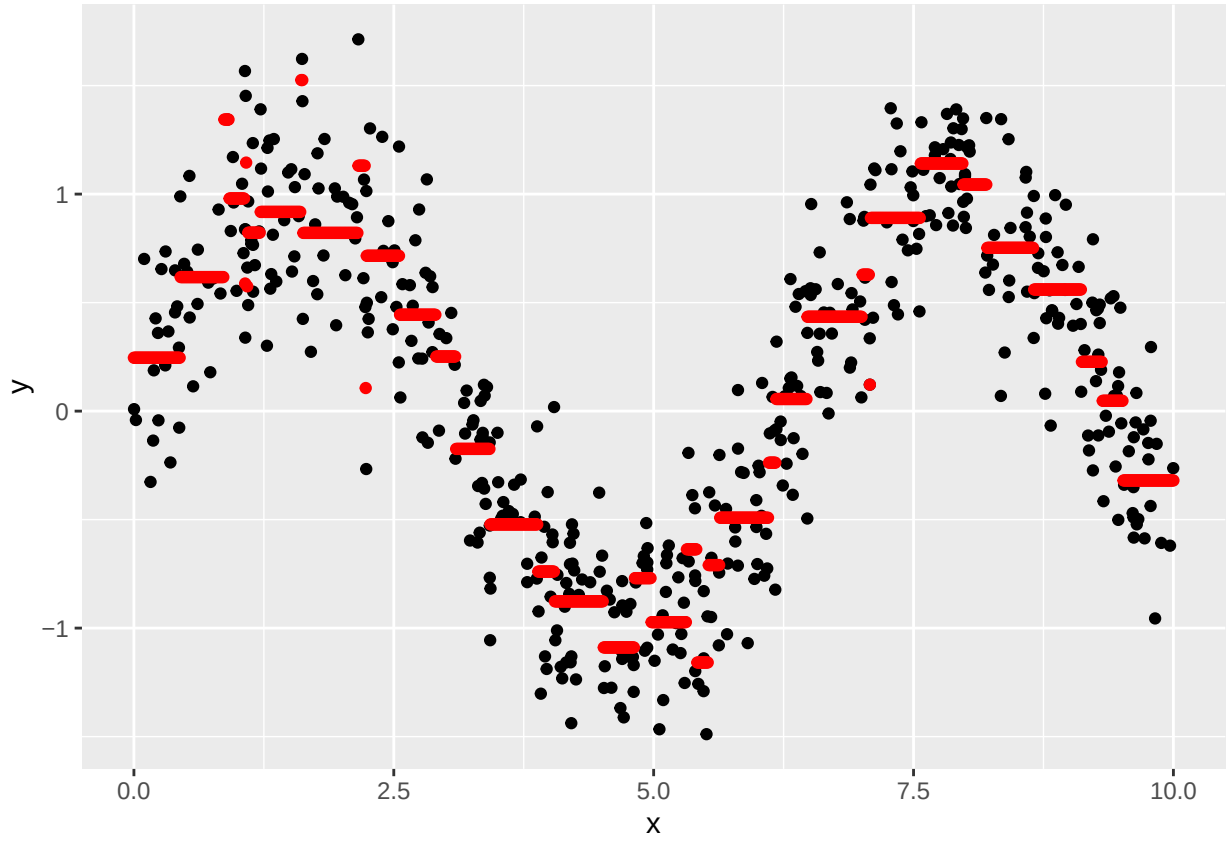

```
which.min(se_by_node_sizes)
```

```
## [1] 25
```

Plot the regression tree model with the optimal node size.

```
rf_mod = randomForest(x = data.frame(x = x_train), y = y_train, ntree = 1 , replace = FALSE, sampsize =
resolution = 0.01
x_grid = seq(from = x_min, to = x_max, by = resolution)
g_x = predict(rf_mod, data.frame(x = x_grid))

ggplot(data.frame( x = x_grid, y = g_x))+
  aes(x = x, y =y)+
  geom_point(data = data.frame( x = x_train, y = y_train))+
  geom_point( color = "red")
```



Provide the bias-variance decomposition of this DGP fit with this model. It is a lot of code, but it is in the practice lectures. If your three numbers don't add up within two significant digits, increase your resolution.

```
rm(list = ls())
```

Take a sample of n = 2000 observations from the diamonds data.

```
pacman::p_load(dplyr)

diamonds_samp = diamonds %>%
  sample_n(2000)

diamonds_samp
```

```
## # A tibble: 2,000 x 10
##    carat cut       color clarity depth table price     x     y     z
##    <dbl> <ord>     <ord> <ord>   <dbl> <dbl> <int> <dbl> <dbl> <dbl>
##  1  0.3  Ideal     G     VS2      62      56   503  4.29  4.32  2.67
##  2  2.07 Premium   H     SI1      62      58 13786  8.17  8.09  5.04
##  3  0.57 Premium   F     VS2      59.5    60  1760  5.44  5.35  3.21
##  4  0.31 Ideal     D     SI1      62      56   684  4.39  4.35  2.71
##  5  0.4  Ideal     H     SI1      62      56   855  4.74  4.68  2.92
##  6  1.02 Ideal     D     SI2      58.9    61  4971  6.56  6.62  3.88
##  7  0.81 Premium   G     VS2      61.4    60  3193  6.02  5.99  3.69
##  8  0.32 Very Good G     VS1      63.2    55   828  4.39  4.37  2.77
```

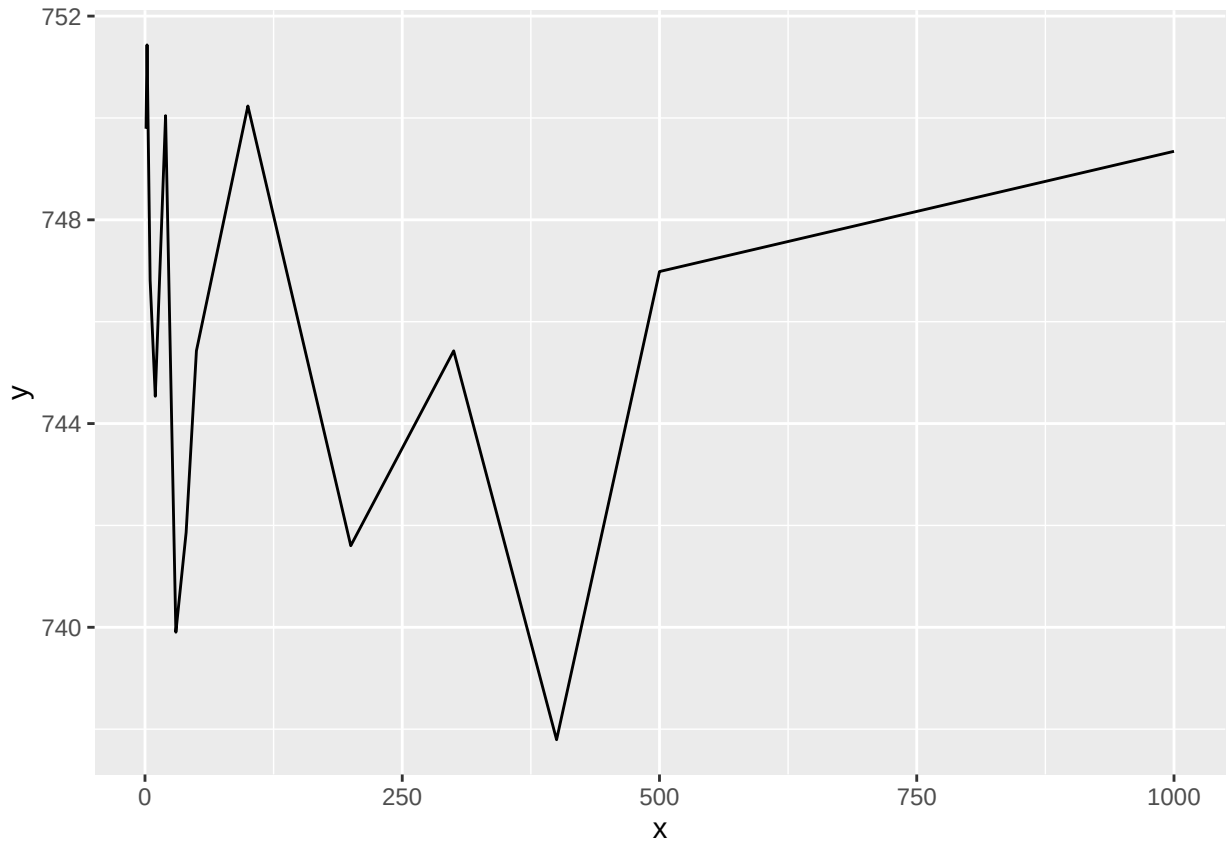
```
##  9  0.49 Very Good G     IF       59.7    56  1865  5.16  5.19  3.09
## 10  0.73 Premium   G     VS2      60.3    57  2581  5.88  5.82  3.53
## # ... with 1,990 more rows
```

find the oob s_e for a RF model using 1, 2, 5, 10, 20, 30, 40, 50, 100, 200, 300, 400, 500, 1000 trees. If you are using the `randomForest` package, you can calculate oob residuals via `e_oob = y_train - rf_mod$predicted`. Plot it.

```
num_trees = c(1, 2, 5, 10, 20, 30, 40, 50, 100, 200, 300, 400, 500, 1000)
oob_se_by_num_trees = array(NA, length(num_trees))

for(i in 1:length(num_trees)){
  rf_mod = randomForest(price ~ ., data = diamonds_samp, ntrees = num_trees[i])
  oob_se_by_num_trees[i] = sd(diamonds_samp$price - rf_mod$predicted)
}

ggplot(data.frame( x = num_trees, y = oob_se_by_num_trees))+
  geom_line(aes(x = x, y = y))
```



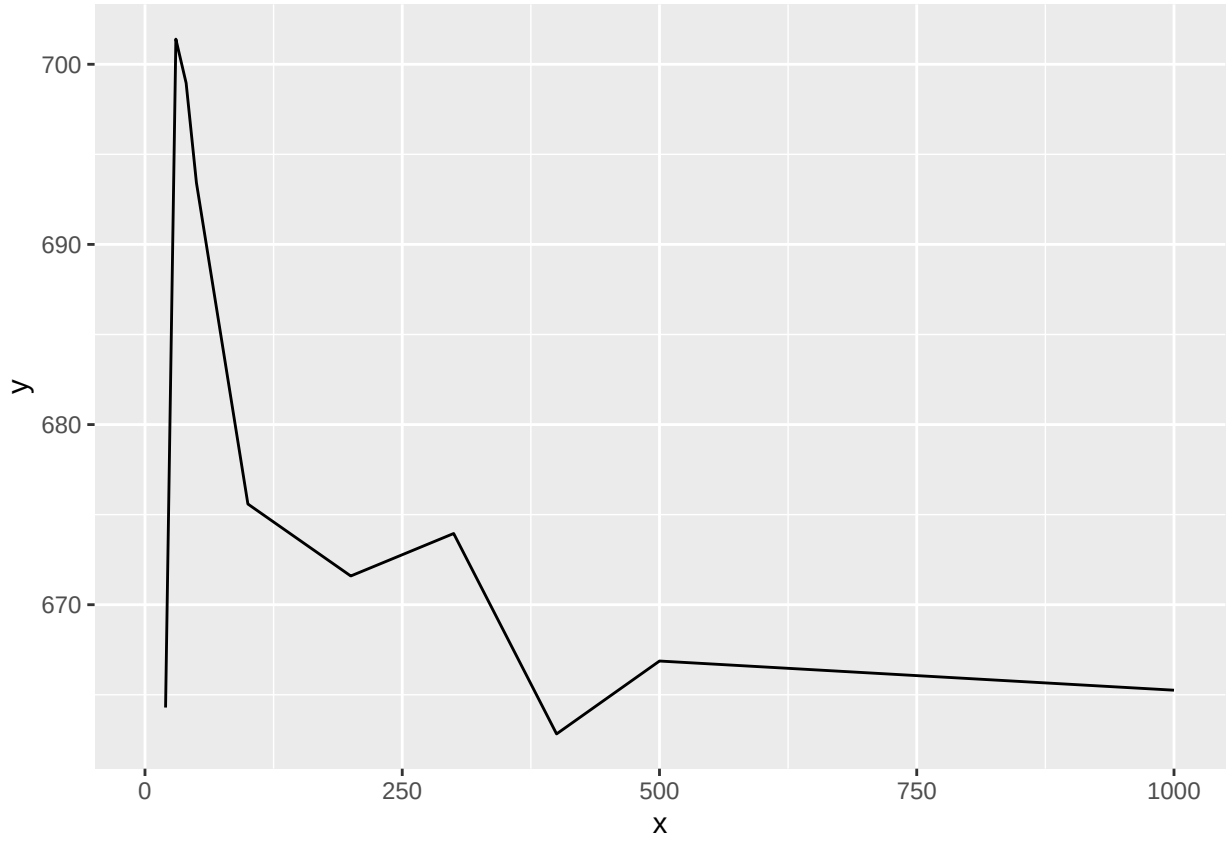
Using the diamonds data, find the oob s_e for a bagged-tree model using 1, 2, 5, 10, 20, 30, 40, 50, 100, 200, 300, 400, 500, 1000 trees. If you are using the `randomForest` package, you can create the bagged tree model via setting an argument within the RF constructor function.

```
num_trees = c(1, 2, 5, 10, 20, 30, 40, 50, 100, 200, 300, 400, 500, 1000)
oob_se_by_num_trees_bag = array(NA, length(num_trees))
for(i in 1:length(num_trees)) {
```

```
  rf_mod = randomForest(price ~ ., data = diamonds_samp, ntree = num_trees[i], mtry = ncol(diamonds_samp
  oob_se_by_num_trees_bag[i] = sd(diamonds_samp$price - rf_mod$predicted)
}

ggplot(data.frame(x = num_trees, y = oob_se_by_num_trees_bag)) +
  geom_line(aes(x = x, y = y))
```

```
## Warning: Removed 4 row(s) containing missing values (geom_path).
```



What is the percentage gain / loss in performance of the RF model vs bagged trees model?

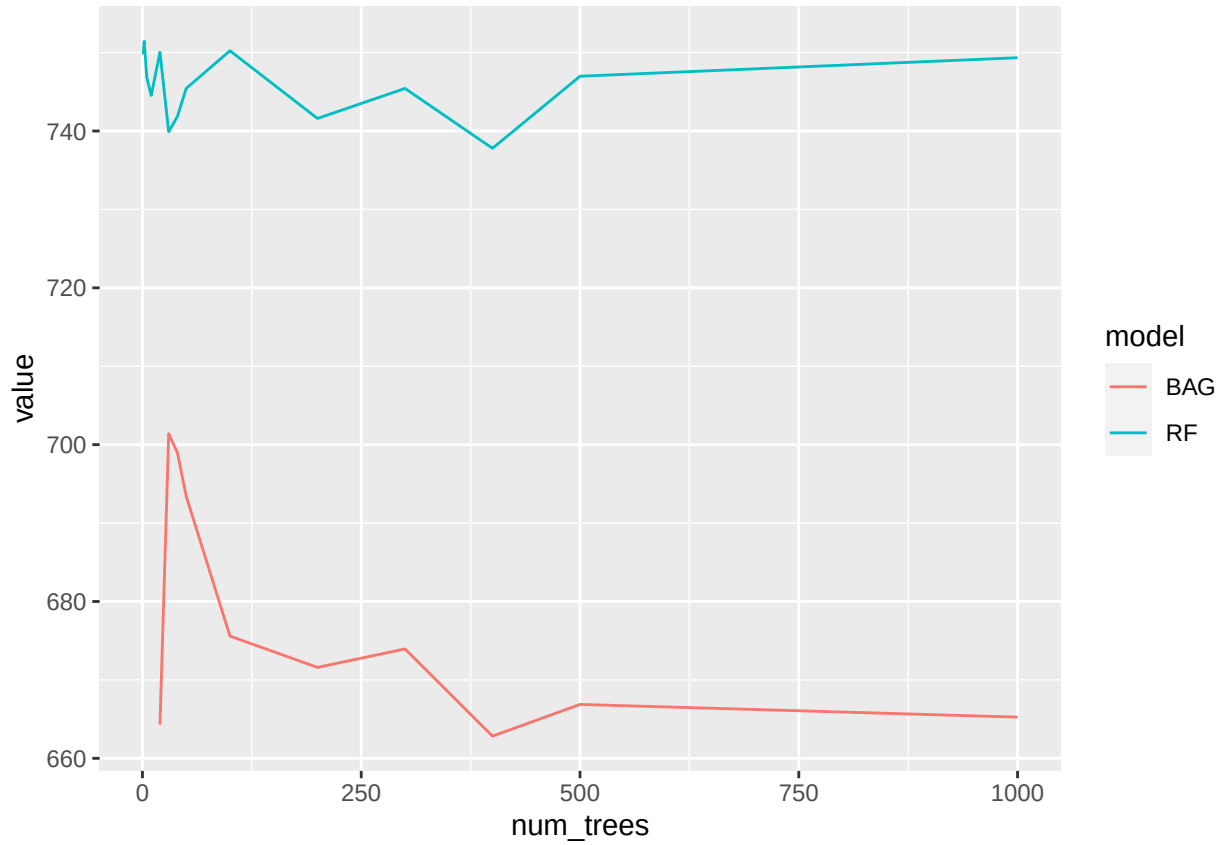
```
(oob_se_by_num_trees - oob_se_by_num_trees_bag) / oob_se_by_num_trees_bag *100
```

```
##  [1]        NA        NA        NA        NA 12.908896  5.490257  6.138480
##  [8]  7.499709 11.048838 10.424108 10.605485 11.310091 12.012947 12.640293
```

Plot bootstrap s_e by number of trees for both RF and bagged trees.

```
ggplot(rbind(data.frame(num_trees = num_trees, value = oob_se_by_num_trees, model = "RF"), data.frame(nu
  geom_line(aes( x = num_trees, y = value, color = model))
```

```
## Warning: Removed 4 row(s) containing missing values (geom_path).
```

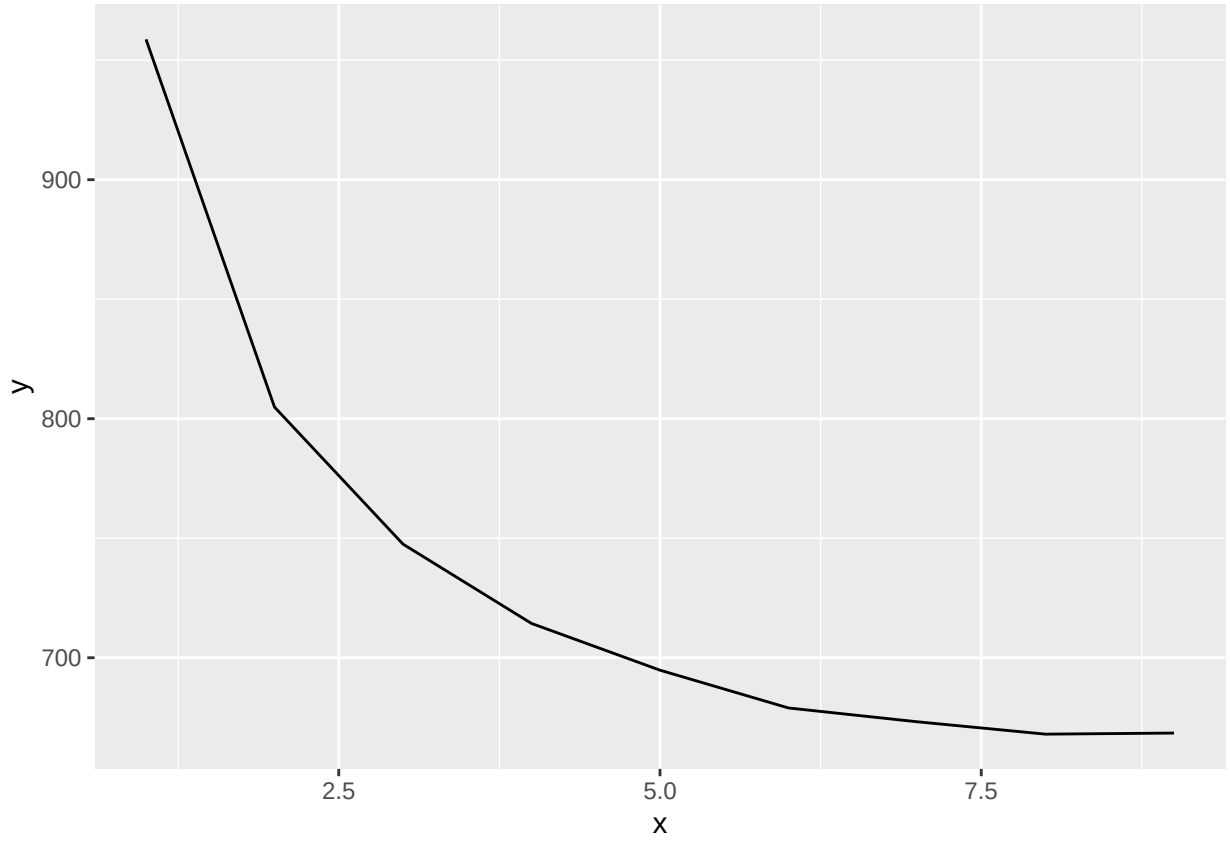


Build RF models for 500 trees using different `mtry` values: 1, 2, ... the maximum. That maximum will be the number of features assuming that we do not binarize categorical features if you are using `randomForest` or the number of features assuming binarization of the categorical features if you are using `YARF`. Calculate bootstrap s_e for all mtry values.

```
mtrys = 1:(ncol(diamonds_samp)-1)
oob_SE_by_mtrys = array(NA, length(mtrys))
for( i in 1:length(mtrys)){
  rf_mod = randomForest(price~., data=diamonds_samp, mtry = mtrys[i])
  oob_SE_by_mtrys[i] = sd(diamonds_samp$price - rf_mod$predicted)
}
```

Plot bootstrap s_e by mtry.

```
ggplot(data.frame(x = mtrys, y = oob_SE_by_mtrys))+
  geom_line(aes(x = x, y = y))
```




```
rm(list = ls())
```

Take a sample of n = 2000 observations from the adult data.

```
pacman::p_load_gh("coatless/ucidata")
data(adult)
adult = na.omit(adult)

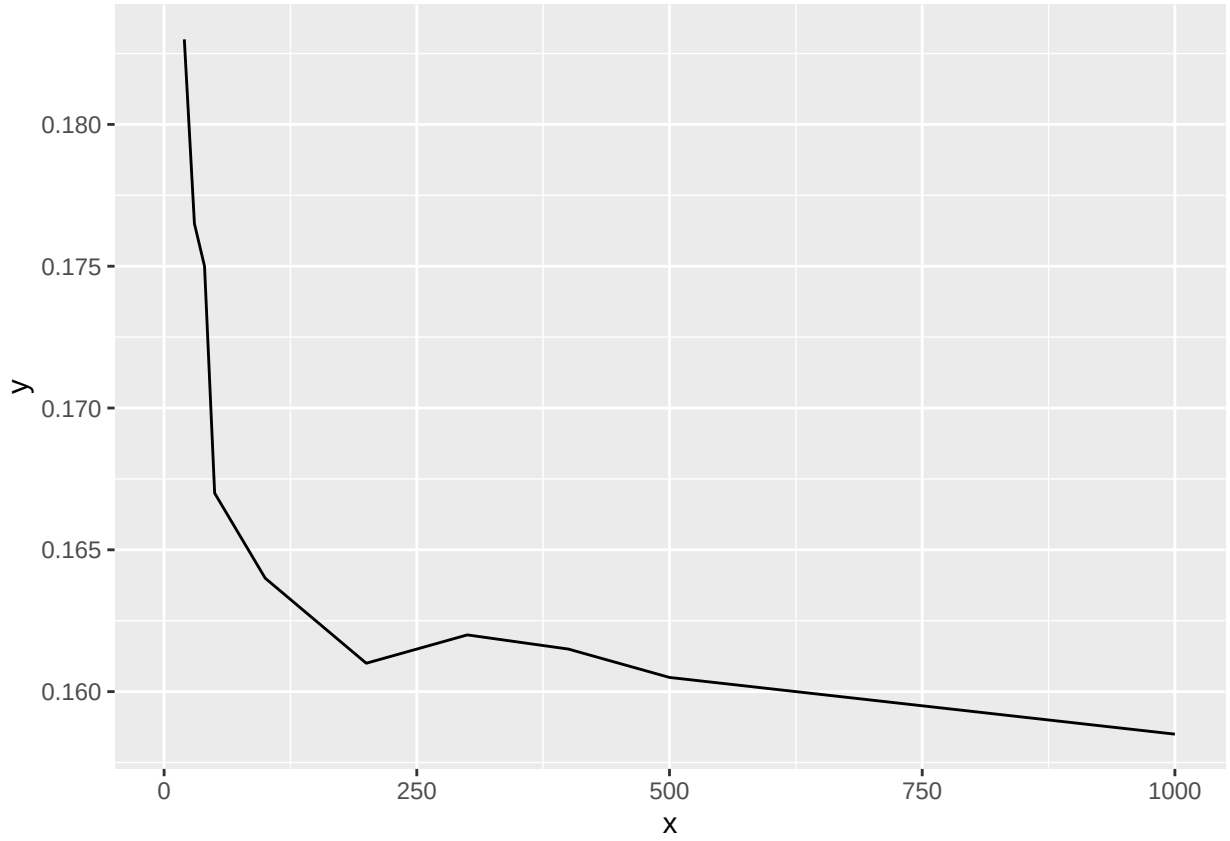
adult_samp = adult %>%
  sample_n(2000)
```

Using the adult data, find the bootstrap misclassification error for an RF model using 1, 2, 5, 10, 20, 30, 40, 50, 100, 200, 300, 400, 500, 1000 trees.

```
num_trees = c(1, 2, 5, 10, 20, 30, 40, 50, 100, 200, 300, 400, 500, 1000)
oob_me_by_num_trees = array(NA, length(num_trees))
for(i in 1:length(num_trees)) {
  rf_mod = randomForest(income ~ ., data = adult_samp, ntree = num_trees[i])
  oob_me_by_num_trees[i] = mean(adult_samp$income != rf_mod$predicted)
}

ggplot(data.frame(x = num_trees, y = oob_me_by_num_trees))+
  geom_line(aes(x = x, y = y))
```

```
## Warning: Removed 4 row(s) containing missing values (geom_path).
```

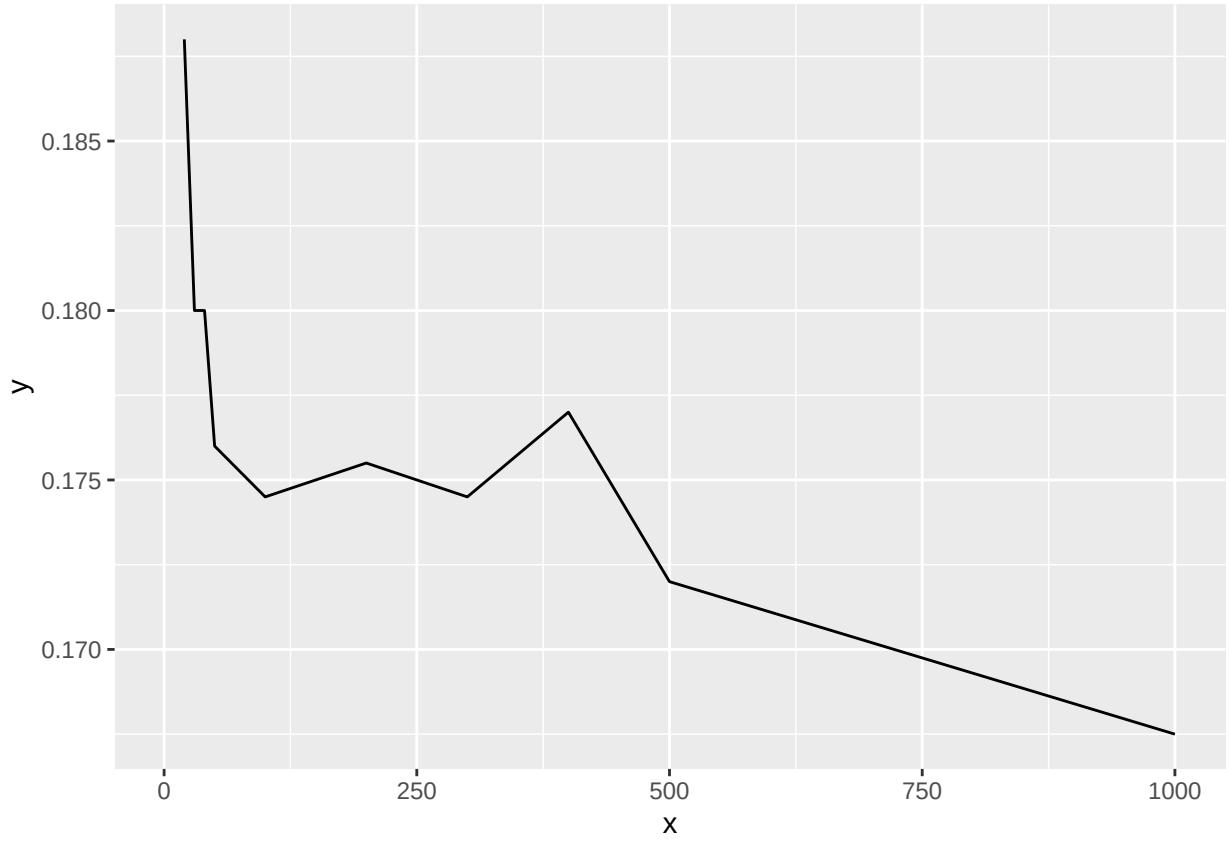


Using the adult data, find the bootstrap misclassification error for a bagged-tree model using 1, 2, 5, 10, 20, 30, 40, 50, 100, 200, 300, 400, 500, 1000 trees.

```
oob_me_by_num_trees_bag = array(NA, length(num_trees))
for(i in 1:length(num_trees)) {
  rf_mod = randomForest(income ~ ., data = adult_samp, ntree = num_trees[i], mtry = ncol(adult)-1)
  oob_me_by_num_trees_bag[i] = mean(adult_samp$income != rf_mod$predicted)
}

ggplot(data.frame(x = num_trees, y = oob_me_by_num_trees_bag))+
  geom_line(aes(x = x, y = y))
```

```
## Warning: Removed 4 row(s) containing missing values (geom_path).
```



What is the percentage gain / loss in performance of the RF model vs bagged trees model?

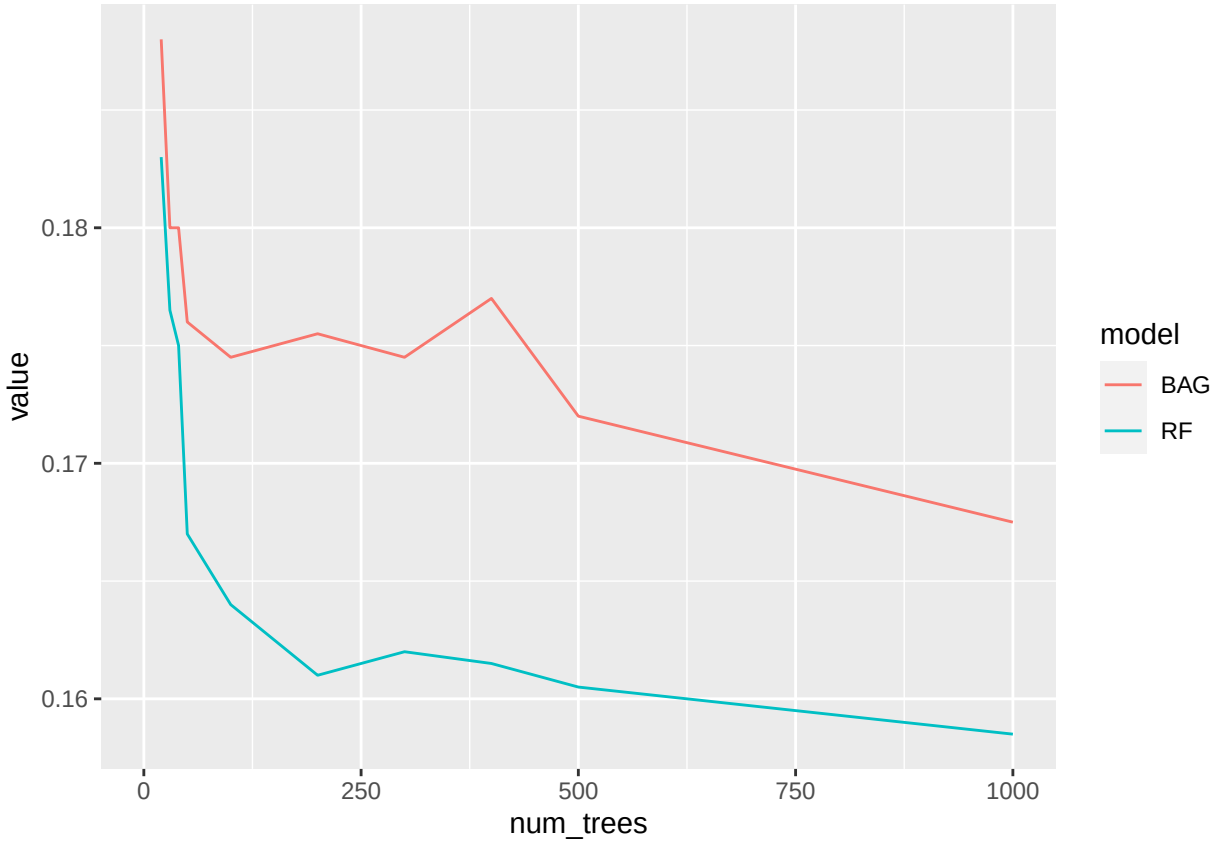
```
(oob_me_by_num_trees - oob_me_by_num_trees_bag) / oob_me_by_num_trees_bag *100
```

```
##  [1]        NA        NA        NA        NA -2.659574 -1.944444 -2.777778
##  [8] -5.113636 -6.017192 -8.262108 -7.163324 -8.757062 -6.686047 -5.373134
```

Plot bootstrap misclassification error by number of trees for both RF and bagged trees.

```
ggplot(rbind(data.frame(num_trees = num_trees, value = oob_me_by_num_trees, model = "RF"), data.frame(nu
  geom_line(aes( x = num_trees, y = value, color = model))
```

```
## Warning: Removed 8 row(s) containing missing values (geom_path).
```



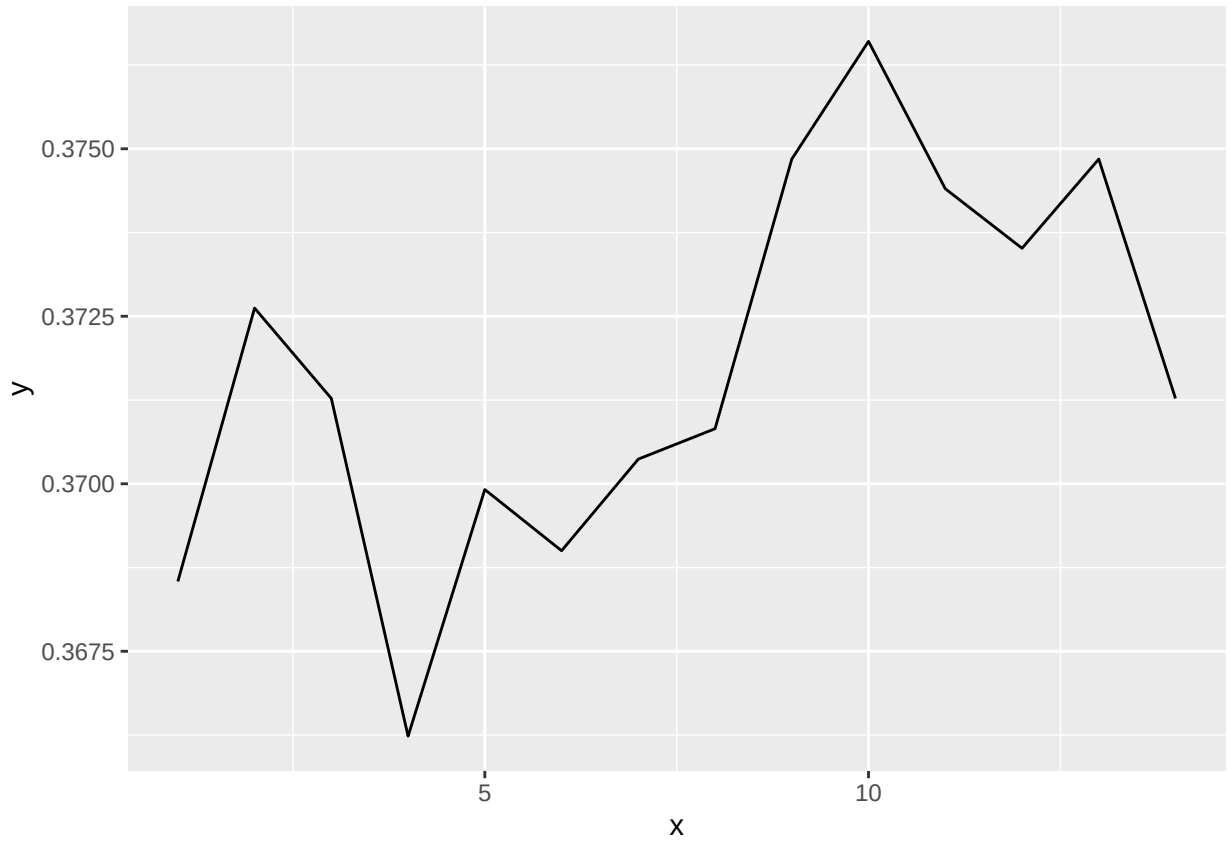
Build RF models for 500 trees using different `mtry` values: 1, 2, ... the maximum (see above as maximum is defined by the specific RF algorithm implementation).

```
mtrys = 1:(ncol(adult_samp)-1)

oob_ME_by_mtrys = array(NA, length(mtrys))
for( i in 1:length(mtrys)){
  rf_mod = randomForest(income~., data=adult_samp, mtry = mtrys[i])
  oob_ME_by_mtrys[i] = sd(adult_samp$income != rf_mod$predicted)
}
```

Plot bootstrap misclassification error by `mtry`.

```
ggplot(data.frame(x = mtrys, y = oob_ME_by_mtrys))+
  geom_line(aes(x = x, y = y))
```




```
rm(list = ls())
```

Write a function `random_bagged_ols` which takes as its arguments `X` and `y` with further arguments `num_ols_models` defaulted to 100 and `mtry` defaulted to NULL which then gets set within the function to be 50% of available features. This argument builds an OLS on a bootstrap sample of the data and uses only `mtry` < `p` of the available features. The function then returns all the `lm` models as a list with size `num_ols_models`.

```
random_bagged_ols = function(X, y, num_ols_models = 100, mtry = NULL){
  colname = colnames(X)

  ols_bag = c()
  for(i in 1:num_ols_models) {
  mtry = sample(colname, floor((ncol(X)-1)/2))
  ols = lm(y ~ ., data = X[,mtry])
  ols_bag[[i]] = ols
  }
  ols_bag
}
```

Load up the Boston Housing Data and separate into `X` and `y`.

```
y = MASS::Boston$medv
X = MASS::Boston
X$medv = NULL
```

```
# testing = random_bagged_ols(X, y)
# testing
```

Similar to lab 1, write a function that takes a matrix and punches holes (i.e. sets entries equal to `NA`) randomly with an argument `prob_missing`.

```
punch_holes = function(X, prob_missing){
  X = as.matrix(X)
  X[sample(1:length(X), length(X)*prob_missing)] <- NA
  X = data.frame(X)
  X
}
```

Create a matrix `Xmiss` which is `X` but has missingness with probability of 10%.

```
Xmiss = punch_holes(X, 0.1)

Xmiss
```

```
##         crim    zn indus chas    nox    rm   age     dis rad tax ptratio  black
## 1    0.00632  18.0  2.31    0     NA 6.575  65.2      NA  NA  NA      NA 396.90
## 2    0.02731   0.0  7.07    0 0.4690 6.421    NA      NA  NA 242    17.8 396.90
## 3    0.02729   0.0  7.07    0 0.4690 7.185  61.1  4.9671   2 242      NA 392.83
## 4    0.03237   0.0  2.18    0 0.4580 6.998  45.8  6.0622   3 222    18.7 394.63
## 5    0.06905   0.0  2.18    0 0.4580 7.147  54.2  6.0622   3 222    18.7 396.90
## 6    0.02985   0.0  2.18    0     NA 6.430  58.7  6.0622   3 222    18.7 394.12
## 7    0.08829  12.5    NA    0 0.5240 6.012  66.6  5.5605   5 311    15.2 395.60
## 8         NA  12.5  7.87    0 0.5240    NA  96.1  5.9505   5  NA      NA 396.90
## 9    0.21124  12.5  7.87    0 0.5240 5.631 100.0  6.0821   5 311    15.2 386.63
## 10   0.17004  12.5  7.87    0 0.5240 6.004  85.9  6.5921   5 311    15.2 386.71
## 11   0.22489  12.5  7.87    0 0.5240 6.377  94.3  6.3467   5 311    15.2 392.52
## 12   0.11747    NA  7.87    0 0.5240 6.009  82.9  6.2267   5 311    15.2 396.90
## 13   0.09378    NA    NA    0 0.5240 5.889  39.0  5.4509   5 311    15.2 390.50
## 14        NA   0.0  8.14   NA 0.5380 5.949  61.8  4.7075   4 307    21.0 396.90
## 15   0.63796   0.0  8.14    0     NA 6.096  84.5  4.4619   4  NA    21.0 380.02
## 16   0.62739   0.0  8.14    0 0.5380 5.834  56.5  4.4986   4 307    21.0 395.62
## 17        NA   0.0  8.14    0 0.5380 5.935  29.3  4.4986   4 307    21.0 386.85
## 18        NA   0.0  8.14    0 0.5380 5.990  81.7  4.2579   4 307    21.0 386.75
## 19   0.80271   0.0  8.14    0 0.5380 5.456    NA  3.7965  NA 307    21.0 288.99
## 20   0.72580   0.0  8.14    0 0.5380 5.727  69.5  3.7965   4  NA    21.0 390.95
## 21   1.25179   0.0  8.14    0 0.5380 5.570  98.1  3.7979   4 307    21.0 376.57
## 22   0.85204   0.0  8.14    0 0.5380 5.965  89.2  4.0123   4 307    21.0 392.53
## 23   1.23247   0.0  8.14    0 0.5380    NA  91.7  3.9769   4 307    21.0 396.90
## 24   0.98843   0.0  8.14    0 0.5380 5.813    NA  4.0952   4 307    21.0 394.54
## 25   0.75026   0.0  8.14    0 0.5380 5.924  94.1  4.3996   4 307    21.0 394.33
## 26   0.84054    NA  8.14    0     NA 5.599  85.7  4.4546   4  NA    21.0 303.42
## 27   0.67191   0.0  8.14    0 0.5380 5.813  90.3  4.6820   4 307    21.0 376.88
## 28   0.95577   0.0  8.14    0 0.5380 6.047  88.8  4.4534   4 307      NA 306.38
## 29   0.77299   0.0  8.14    0 0.5380 6.495  94.4  4.4547  NA 307      NA 387.94
## 30   1.00245   0.0  8.14    0 0.5380    NA  87.3  4.2390   4 307    21.0 380.23
## 31   1.13081   0.0  8.14    0 0.5380 5.713  94.1  4.2330   4 307    21.0 360.17
## 32   1.35472   0.0  8.14    0 0.5380 6.072    NA      NA   4 307    21.0 376.73
```

```
## 33   1.38799   0.0  8.14    0 0.5380 5.950    NA  3.9900   4 307    21.0 232.60
## 34   1.15172    NA  8.14    0 0.5380 5.701  95.0  3.7872   4 307    21.0 358.77
## 35   1.61282   0.0    NA    0 0.5380 6.096  96.9  3.7598   4 307    21.0 248.31
## 36   0.06417   0.0  5.96    0 0.4990 5.933  68.2  3.3603   5 279    19.2 396.90
## 37   0.09744   0.0  5.96    0 0.4990 5.841  61.4  3.3779  NA 279    19.2 377.56
## 38   0.08014   0.0  5.96    0 0.4990 5.850  41.5  3.9342   5 279    19.2 396.90
## 39   0.17505   0.0  5.96    0 0.4990 5.966  30.2  3.8473   5 279    19.2 393.43
## 40   0.02763    NA    NA    0 0.4280 6.595  21.8  5.4011   3 252    18.3 395.63
## 41   0.03359    NA    NA    0 0.4280    NA  15.8  5.4011  NA 252    18.3 395.62
## 42   0.12744   0.0  6.91   NA 0.4480 6.770   2.9  5.7209   3 233    17.9 385.41
## 43   0.14150   0.0    NA    0 0.4480 6.169   6.6  5.7209   3 233    17.9 383.37
## 44   0.15936   0.0  6.91    0 0.4480 6.211    NA  5.7209   3 233    17.9 394.46
## 45   0.12269   0.0  6.91    0 0.4480 6.069  40.0  5.7209   3 233    17.9 389.39
## 46   0.17142   0.0  6.91    0 0.4480 5.682  33.8  5.1004   3 233    17.9 396.90
## 47   0.18836   0.0  6.91    0 0.4480 5.786  33.3  5.1004   3 233      NA 396.90
## 48   0.22927   0.0  6.91    0 0.4480 6.030  85.5  5.6894   3 233    17.9 392.74
## 49   0.25387   0.0  6.91    0 0.4480 5.399  95.3  5.8700   3 233    17.9 396.90
## 50   0.21977   0.0  6.91    0     NA 5.602  62.0  6.0877   3 233    17.9 396.90
## 51   0.08873  21.0  5.64    0 0.4390 5.963  45.7      NA   4 243    16.8 395.56
## 52   0.04337  21.0  5.64    0 0.4390 6.115  63.0      NA   4  NA    16.8 393.97
## 53   0.05360  21.0  5.64    0 0.4390 6.511  21.1  6.8147   4 243    16.8 396.90
## 54        NA  21.0  5.64    0 0.4390 5.998  21.4  6.8147   4 243    16.8 396.90
## 55        NA  75.0  4.00    0 0.4100    NA    NA  7.3197   3 469    21.1 396.90
## 56   0.01311  90.0  1.22    0 0.4030 7.249    NA  8.6966   5 226    17.9 395.93
## 57        NA  85.0    NA   NA 0.4100 6.383  35.7  9.1876   2 313    17.3 396.90
## 58   0.01432 100.0  1.32    0 0.4110 6.816  40.5  8.3248   5 256    15.1 392.90
## 59   0.15445  25.0  5.13    0 0.4530 6.145  29.2  7.8148   8 284    19.7 390.68
## 60   0.10328  25.0  5.13    0 0.4530 5.927  47.2  6.9320   8 284    19.7 396.90
## 61   0.14932  25.0  5.13    0 0.4530 5.741  66.2  7.2254   8 284    19.7 395.11
## 62   0.17171  25.0  5.13    0 0.4530 5.966  93.4  6.8185   8 284    19.7 378.08
## 63   0.11027  25.0    NA    0 0.4530 6.456  67.8  7.2255   8 284    19.7 396.90
## 64   0.12650  25.0  5.13    0 0.4530 6.762  43.4  7.9809   8 284    19.7 395.58
## 65   0.01951  17.5  1.38   NA 0.4161 7.104  59.5      NA   3 216    18.6 393.24
## 66   0.03584  80.0  3.37    0 0.3980 6.290  17.8  6.6115   4 337    16.1 396.90
## 67   0.04379  80.0  3.37    0 0.3980 5.787    NA  6.6115   4 337    16.1 396.90
## 68        NA  12.5  6.07    0 0.4090 5.878  21.4  6.4980   4 345    18.9 396.21
## 69   0.13554  12.5  6.07   NA 0.4090 5.594  36.8  6.4980   4 345    18.9     NA
## 70   0.12816  12.5  6.07   NA 0.4090 5.885  33.0      NA   4 345    18.9 396.90
## 71   0.08826   0.0 10.81    0 0.4130 6.417   6.6  5.2873   4 305    19.2 383.73
## 72   0.15876   0.0 10.81    0 0.4130    NA  17.5  5.2873   4 305    19.2 376.94
## 73   0.09164   0.0    NA    0 0.4130    NA   7.8  5.2873   4 305    19.2 390.91
## 74   0.19539   0.0 10.81    0 0.4130 6.245    NA  5.2873   4 305      NA     NA
## 75   0.07896   0.0 12.83    0 0.4370 6.273   6.0  4.2515   5 398    18.7 394.92
## 76   0.09512   0.0 12.83    0 0.4370 6.286  45.0  4.5026   5 398    18.7 383.23
## 77   0.10153   0.0 12.83    0 0.4370 6.279  74.5  4.0522   5  NA    18.7 373.66
## 78   0.08707   0.0 12.83    0 0.4370 6.140  45.8  4.0905   5 398    18.7 386.96
## 79        NA   0.0 12.83    0 0.4370 6.232  53.7  5.0141  NA 398    18.7 386.40
## 80   0.08387    NA 12.83    0 0.4370 5.874  36.6  4.5026   5 398    18.7 396.06
## 81   0.04113  25.0  4.86    0 0.4260    NA  33.5  5.4007   4 281    19.0 396.90
## 82   0.04462  25.0  4.86    0 0.4260 6.619  70.4  5.4007   4 281    19.0 395.63
## 83        NA  25.0  4.86    0 0.4260 6.302  32.2  5.4007   4 281    19.0     NA
## 84   0.03551  25.0  4.86    0 0.4260 6.167  46.7  5.4007   4 281    19.0 390.64
## 85   0.05059   0.0  4.49    0 0.4490    NA  48.0  4.7794  NA 247    18.5     NA
## 86   0.05735   0.0  4.49    0     NA 6.630    NA  4.4377   3 247    18.5 392.30
```

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## 87   0.05188   0.0  4.49    0 0.4490 6.015  45.1  4.4272   3 247    18.5 395.99
## 88   0.07151   0.0  4.49    0     NA    NA  56.8  3.7476   3 247    18.5 395.15
## 89        NA   0.0  3.41    0 0.4890 7.007  86.3  3.4217   2 270    17.8 396.90
## 90   0.05302    NA  3.41    0 0.4890 7.079  63.1  3.4145   2 270    17.8 396.06
## 91   0.04684   0.0  3.41    0     NA    NA  66.1  3.0923   2  NA    17.8     NA
## 92   0.03932   0.0  3.41    0 0.4890 6.405  73.9  3.0921   2 270    17.8     NA
## 93   0.04203  28.0 15.04    0 0.4640 6.442  53.6  3.6659   4  NA    18.2     NA
## 94   0.02875  28.0 15.04    0 0.4640    NA  28.9  3.6659   4 270    18.2 396.33
## 95   0.04294  28.0 15.04    0 0.4640 6.249  77.3  3.6150   4 270    18.2 396.90
## 96   0.12204   0.0  2.89    0 0.4450 6.625  57.8  3.4952   2 276    18.0 357.98
## 97   0.11504   0.0  2.89    0 0.4450 6.163  69.6  3.4952   2 276    18.0 391.83
## 98   0.12083   0.0  2.89   NA 0.4450    NA  76.0  3.4952   2 276    18.0     NA
## 99   0.08187   0.0  2.89    0 0.4450 7.820  36.9  3.4952   2 276    18.0 393.53
## 100  0.06860   0.0  2.89    0 0.4450 7.416  62.5  3.4952   2 276    18.0 396.90
## 101  0.14866   0.0  8.56    0 0.5200 6.727  79.9  2.7778   5  NA      NA 394.76
## 102  0.11432   0.0  8.56    0 0.5200 6.781  71.3  2.8561   5 384    20.9 395.58
## 103  0.22876   0.0  8.56    0 0.5200 6.405    NA      NA   5 384    20.9  70.80
## 104  0.21161   0.0  8.56    0 0.5200 6.137  87.4  2.7147   5 384    20.9 394.47
## 105  0.13960   0.0  8.56    0 0.5200 6.167  90.0  2.4210  NA 384    20.9 392.69
## 106  0.13262   0.0  8.56    0 0.5200 5.851  96.7      NA   5 384    20.9     NA
## 107       NA   0.0  8.56    0 0.5200 5.836  91.9  2.2110   5 384    20.9 395.67
## 108  0.13117   0.0  8.56    0 0.5200 6.127  85.2  2.1224   5 384    20.9 387.69
## 109       NA   0.0  8.56    0 0.5200 6.474  97.1  2.4329   5 384      NA 395.24
## 110  0.26363   0.0  8.56    0 0.5200 6.229  91.2  2.5451   5  NA    20.9 391.23
## 111  0.10793   0.0  8.56    0 0.5200 6.195  54.4  2.7778   5 384    20.9 393.49
## 112  0.10084   0.0 10.01    0 0.5470 6.715  81.6  2.6775   6 432    17.8     NA
## 113  0.12329   0.0 10.01    0 0.5470 5.913  92.9  2.3534   6 432      NA 394.95
## 114  0.22212   0.0 10.01    0 0.5470 6.092  95.4  2.5480  NA 432      NA 396.90
## 115  0.14231   0.0 10.01   NA 0.5470 6.254  84.2  2.2565   6 432    17.8 388.74
## 116  0.17134   0.0 10.01    0     NA 5.928  88.2  2.4631   6 432    17.8 344.91
## 117  0.13158   0.0 10.01   NA 0.5470 6.176  72.5  2.7301   6 432    17.8 393.30
## 118  0.15098   0.0 10.01    0 0.5470 6.021  82.6  2.7474   6 432    17.8     NA
## 119  0.13058   0.0 10.01    0 0.5470 5.872  73.1  2.4775   6 432    17.8 338.63
## 120  0.14476   0.0 10.01    0 0.5470 5.731  65.2  2.7592   6 432    17.8     NA
## 121       NA   0.0 25.65    0 0.5810 5.870  69.7  2.2577   2 188      NA 389.15
## 122  0.07165   0.0 25.65    0 0.5810 6.004  84.1      NA   2 188    19.1 377.67
## 123  0.09299   0.0 25.65    0     NA    NA  92.9  2.0869   2  NA    19.1 378.09
## 124  0.15038   0.0 25.65    0 0.5810 5.856  97.0      NA   2 188      NA 370.31
## 125  0.09849   0.0 25.65    0     NA 5.879  95.8  2.0063   2 188    19.1 379.38
## 126  0.16902   0.0 25.65    0 0.5810 5.986  88.4  1.9929   2 188    19.1 385.02
## 127  0.38735   0.0 25.65    0 0.5810 5.613  95.6  1.7572   2 188    19.1 359.29
## 128  0.25915    NA 21.89   NA 0.6240 5.693  96.0  1.7883   4  NA    21.2 392.11
## 129  0.32543   0.0 21.89    0 0.6240 6.431  98.8  1.8125   4 437    21.2 396.90
## 130  0.88125   0.0 21.89    0 0.6240 5.637  94.7  1.9799   4  NA    21.2 396.90
## 131  0.34006   0.0 21.89   NA 0.6240 6.458  98.9  2.1185   4 437      NA 395.04
## 132  1.19294   0.0 21.89    0 0.6240 6.326  97.7  2.2710   4 437    21.2 396.90
## 133  0.59005   0.0 21.89    0 0.6240 6.372  97.9      NA   4 437      NA 385.76
## 134  0.32982   0.0 21.89    0 0.6240    NA  95.4  2.4699   4 437    21.2 388.69
## 135       NA   0.0 21.89    0 0.6240 5.757  98.4  2.3460   4 437    21.2 262.76
## 136       NA   0.0 21.89    0 0.6240    NA  98.2  2.1107   4 437    21.2 394.67
## 137  0.32264   0.0    NA    0 0.6240 5.942  93.5      NA   4 437    21.2 378.25
## 138  0.35233   0.0 21.89    0 0.6240 6.454  98.4  1.8498   4 437    21.2 394.08
## 139  0.24980   0.0 21.89    0 0.6240 5.857  98.2  1.6686   4 437    21.2 392.04
## 140  0.54452   0.0 21.89    0 0.6240 6.151  97.9  1.6687   4 437      NA 396.90
```

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## 141  0.29090   0.0 21.89    0 0.6240 6.174  93.6  1.6119   4  NA    21.2 388.08
## 142       NA    NA 21.89    0 0.6240 5.019 100.0  1.4394   4 437    21.2 396.90
## 143  3.32105   0.0 19.58    1 0.8710 5.403 100.0  1.3216   5 403    14.7 396.90
## 144  4.09740   0.0 19.58    0 0.8710    NA 100.0      NA   5 403    14.7 396.90
## 145       NA   0.0 19.58    0 0.8710 4.903  97.8  1.3459   5 403    14.7 396.90
## 146  2.37934   0.0 19.58    0 0.8710 6.130 100.0  1.4191   5 403    14.7 172.91
## 147  2.15505   0.0 19.58    0 0.8710    NA 100.0  1.5166   5 403    14.7     NA
## 148  2.36862   0.0 19.58    0 0.8710 4.926  95.7      NA  NA 403    14.7 391.71
## 149  2.33099   0.0 19.58   NA 0.8710 5.186  93.8  1.5296   5 403    14.7 356.99
## 150  2.73397   0.0 19.58   NA     NA 5.597  94.9  1.5257   5  NA    14.7 351.85
## 151       NA   0.0 19.58    0 0.8710 6.122  97.3  1.6180   5 403    14.7     NA
## 152  1.49632   0.0 19.58    0 0.8710 5.404 100.0      NA   5  NA    14.7 341.60
## 153  1.12658   0.0 19.58    1 0.8710 5.012  88.0  1.6102   5 403    14.7 343.28
## 154  2.14918   0.0 19.58    0     NA 5.709  98.5  1.6232   5 403    14.7 261.95
## 155  1.41385   0.0 19.58    1 0.8710    NA  96.0  1.7494   5 403    14.7 321.02
## 156  3.53501   0.0 19.58    1 0.8710    NA  82.6  1.7455   5 403    14.7  88.01
## 157  2.44668   0.0 19.58    0 0.8710    NA  94.0  1.7364   5 403    14.7  88.63
## 158  1.22358   0.0 19.58    0 0.6050 6.943  97.4  1.8773  NA 403    14.7 363.43
## 159       NA   0.0 19.58    0 0.6050 6.066 100.0  1.7573   5 403    14.7     NA
## 160  1.42502   0.0 19.58    0 0.8710 6.510 100.0  1.7659   5 403      NA     NA
## 161  1.27346   0.0 19.58    1     NA 6.250  92.6  1.7984   5  NA    14.7 338.92
## 162  1.46336   0.0 19.58    0 0.6050 7.489  90.8  1.9709  NA  NA    14.7 374.43
## 163  1.83377   0.0 19.58    1 0.6050 7.802  98.2  2.0407  NA 403    14.7 389.61
## 164  1.51902   0.0    NA    1 0.6050 8.375  93.9  2.1620   5 403    14.7     NA
## 165  2.24236   0.0 19.58   NA 0.6050 5.854  91.8  2.4220   5  NA    14.7 395.11
## 166  2.92400   0.0 19.58    0 0.6050 6.101  93.0      NA  NA 403    14.7 240.16
## 167  2.01019   0.0 19.58   NA 0.6050 7.929  96.2  2.0459   5 403    14.7 369.30
## 168       NA   0.0 19.58    0 0.6050 5.877  79.2  2.4259   5 403    14.7 227.61
## 169  2.30040   0.0 19.58    0 0.6050 6.319    NA  2.1000   5 403    14.7 297.09
## 170  2.44953   0.0 19.58   NA 0.6050 6.402  95.2  2.2625   5 403    14.7     NA
## 171  1.20742   0.0 19.58    0 0.6050 5.875  94.6  2.4259   5 403    14.7 292.29
## 172  2.31390   0.0 19.58    0 0.6050 5.880  97.3  2.3887   5 403    14.7 348.13
## 173  0.13914   0.0  4.05    0 0.5100 5.572  88.5  2.5961   5 296    16.6 396.90
## 174  0.09178   0.0  4.05    0 0.5100 6.416  84.1  2.6463   5 296    16.6 395.50
## 175  0.08447   0.0  4.05    0 0.5100 5.859    NA  2.7019   5 296    16.6 393.23
## 176  0.06664   0.0  4.05    0 0.5100 6.546  33.1      NA   5 296      NA 390.96
## 177  0.07022    NA  4.05    0     NA 6.020  47.2  3.5549   5 296    16.6 393.23
## 178  0.05425   0.0    NA    0 0.5100 6.315    NA  3.3175   5 296      NA 395.60
## 179  0.06642   0.0  4.05   NA 0.5100 6.860    NA  2.9153   5 296    16.6 391.27
## 180  0.05780   0.0  2.46    0 0.4880 6.980    NA  2.8290   3 193    17.8 396.90
## 181  0.06588   0.0  2.46   NA 0.4880    NA  83.3  2.7410   3  NA    17.8 395.56
## 182  0.06888   0.0  2.46    0     NA 6.144  62.2  2.5979   3 193      NA     NA
## 183  0.09103   0.0  2.46    0 0.4880 7.155  92.2  2.7006   3 193    17.8     NA
## 184  0.10008    NA  2.46    0 0.4880 6.563  95.6  2.8470   3 193    17.8 396.90
## 185  0.08308   0.0  2.46    0 0.4880 5.604  89.8  2.9879   3 193    17.8 391.00
## 186  0.06047   0.0    NA   NA 0.4880 6.153    NA      NA   3 193    17.8 387.11
## 187  0.05602   0.0    NA    0 0.4880 7.831  53.6      NA  NA 193      NA 392.63
## 188  0.07875  45.0  3.44    0     NA 6.782  41.1  3.7886   5 398    15.2 393.87
## 189  0.12579  45.0  3.44    0 0.4370 6.556  29.1  4.5667  NA 398    15.2 382.84
## 190  0.08370  45.0  3.44    0 0.4370 7.185  38.9  4.5667   5 398    15.2 396.90
## 191  0.09068  45.0  3.44    0     NA 6.951  21.5      NA   5 398    15.2 377.68
## 192  0.06911  45.0  3.44    0 0.4370 6.739  30.8  6.4798   5 398    15.2 389.71
## 193       NA  45.0  3.44    0 0.4370 7.178  26.3  6.4798   5 398    15.2 390.49
## 194       NA  60.0  2.93    0 0.4010 6.800   9.9  6.2196  NA 265      NA 393.37
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## 195  0.01439    NA  2.93    0 0.4010 6.604  18.8  6.2196   1 265      NA 376.70
## 196  0.01381  80.0  0.46   NA 0.4220 7.875  32.0  5.6484   4 255    14.4     NA
## 197  0.04011  80.0  1.52    0 0.4040 7.287  34.1      NA   2 329    12.6     NA
## 198  0.04666  80.0  1.52    0 0.4040 7.107  36.6  7.3090   2 329    12.6 354.31
## 199  0.03768  80.0  1.52    0 0.4040 7.274  38.3  7.3090   2 329    12.6 392.20
## 200  0.03150  95.0  1.47    0 0.4030 6.975  15.3  7.6534   3 402    17.0 396.90
## 201  0.01778  95.0  1.47    0 0.4030 7.135  13.9  7.6534   3 402    17.0     NA
## 202  0.03445  82.5  2.03   NA 0.4150    NA  38.4      NA   2  NA    14.7 393.77
## 203  0.02177  82.5  2.03    0     NA 7.610    NA      NA   2 348    14.7 395.38
## 204  0.03510  95.0  2.68    0 0.4161 7.853  33.2  5.1180  NA 224    14.7 392.78
## 205  0.02009  95.0  2.68   NA 0.4161    NA  31.9  5.1180   4 224    14.7 390.55
## 206  0.13642   0.0 10.59    0 0.4890 5.891  22.3      NA   4 277    18.6 396.90
## 207  0.22969   0.0 10.59    0 0.4890 6.326  52.5      NA   4 277    18.6 394.87
## 208  0.25199   0.0 10.59    0 0.4890 5.783  72.7  4.3549   4 277    18.6 389.43
## 209  0.13587   0.0 10.59   NA 0.4890    NA  59.1  4.2392   4 277    18.6 381.32
## 210  0.43571   0.0 10.59    1 0.4890 5.344 100.0  3.8750  NA 277    18.6 396.90
## 211  0.17446   0.0 10.59    1 0.4890    NA  92.1  3.8771   4  NA      NA 393.25
## 212  0.37578   0.0 10.59    1 0.4890 5.404  88.6  3.6650   4 277    18.6 395.24
## 213       NA   0.0 10.59    1 0.4890 5.807  53.8  3.6526   4 277    18.6     NA
## 214  0.14052   0.0 10.59    0     NA 6.375  32.3  3.9454   4 277    18.6 385.81
## 215  0.28955   0.0 10.59    0 0.4890 5.412   9.8  3.5875   4 277    18.6 348.93
## 216  0.19802   0.0 10.59   NA 0.4890 6.182  42.4  3.9454   4  NA    18.6 393.63
## 217  0.04560    NA 13.89   NA 0.5500 5.888  56.0  3.1121  NA 276    16.4     NA
## 218  0.07013   0.0 13.89    0 0.5500 6.642  85.1  3.4211   5 276    16.4 392.78
## 219  0.11069   0.0 13.89    1 0.5500 5.951  93.8  2.8893   5 276    16.4 396.90
## 220  0.11425    NA 13.89    1 0.5500 6.373  92.4  3.3633   5 276    16.4 393.74
## 221  0.35809   0.0  6.20    1 0.5070 6.951  88.5  2.8617   8 307    17.4 391.70
## 222  0.40771   0.0  6.20    1 0.5070 6.164  91.3  3.0480   8 307    17.4 395.24
## 223  0.62356   0.0  6.20    1 0.5070 6.879  77.7  3.2721   8 307    17.4 390.39
## 224  0.61470   0.0  6.20    0 0.5070 6.618  80.8  3.2721   8 307    17.4 396.90
## 225  0.31533   0.0    NA    0 0.5040 8.266  78.3  2.8944   8 307    17.4 385.05
## 226  0.52693   0.0  6.20    0 0.5040 8.725  83.0  2.8944   8 307    17.4     NA
## 227  0.38214   0.0  6.20    0     NA 8.040  86.5  3.2157   8 307    17.4 387.38
## 228  0.41238   0.0  6.20    0 0.5040 7.163  79.9      NA   8 307    17.4 372.08
## 229       NA   0.0  6.20    0 0.5040 7.686  17.0  3.3751   8 307    17.4 377.51
## 230       NA   0.0  6.20    0 0.5040 6.552  21.4  3.3751  NA 307    17.4 380.34
## 231  0.53700   0.0  6.20    0 0.5040 5.981  68.1  3.6715   8 307    17.4     NA
## 232  0.46296   0.0  6.20    0 0.5040 7.412  76.9  3.6715   8 307    17.4 376.14
## 233  0.57529   0.0  6.20    0 0.5070 8.337    NA  3.8384   8 307    17.4 385.91
## 234  0.33147   0.0  6.20    0 0.5070 8.247    NA  3.6519   8 307    17.4 378.95
## 235  0.44791   0.0  6.20    1 0.5070 6.726  66.5  3.6519   8 307    17.4 360.20
## 236  0.33045   0.0  6.20    0 0.5070    NA  61.5  3.6519   8 307    17.4 376.75
## 237  0.52058   0.0  6.20    1 0.5070 6.631  76.5  4.1480   8 307    17.4 388.45
## 238  0.51183    NA  6.20    0 0.5070 7.358  71.6  4.1480   8  NA    17.4 390.07
## 239  0.08244  30.0  4.93    0 0.4280 6.481  18.5  6.1899  NA 300    16.6 379.41
## 240  0.09252  30.0  4.93    0 0.4280 6.606  42.2  6.1899   6 300    16.6     NA
## 241  0.11329  30.0  4.93    0 0.4280 6.897  54.3  6.3361   6 300    16.6 391.25
## 242  0.10612  30.0    NA    0 0.4280 6.095  65.1  6.3361   6 300    16.6 394.62
## 243  0.10290  30.0  4.93    0 0.4280 6.358  52.9  7.0355   6 300      NA 372.75
## 244  0.12757  30.0    NA   NA 0.4280 6.393    NA  7.0355   6 300    16.6 374.71
## 245  0.20608  22.0  5.86    0 0.4310 5.593  76.5  7.9549   7 330    19.1 372.49
## 246  0.19133  22.0  5.86    0 0.4310 5.605  70.2      NA   7 330    19.1 389.13
## 247       NA  22.0  5.86    0 0.4310 6.108  34.9  8.0555   7 330    19.1 390.18
## 248  0.19657  22.0  5.86   NA 0.4310 6.226  79.2  8.0555   7 330    19.1 376.14
```

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## 249  0.16439  22.0  5.86    0 0.4310 6.433  49.1  7.8265   7 330      NA 374.71
## 250  0.19073  22.0  5.86    0 0.4310    NA  17.5  7.8265   7 330    19.1 393.74
## 251  0.14030  22.0  5.86    0 0.4310 6.487  13.0  7.3967   7 330    19.1     NA
## 252  0.21409  22.0  5.86    0 0.4310 6.438   8.9  7.3967   7 330    19.1 377.07
## 253  0.08221  22.0  5.86    0 0.4310 6.957   6.8  8.9067   7 330    19.1     NA
## 254  0.36894  22.0  5.86    0 0.4310 8.259   8.4  8.9067   7  NA    19.1 396.90
## 255  0.04819  80.0  3.64    0 0.3920 6.108  32.0      NA   1 315    16.4 392.89
## 256  0.03548  80.0  3.64    0     NA 5.876  19.1  9.2203   1 315    16.4 395.18
## 257  0.01538  90.0  3.75    0 0.3940 7.454  34.2  6.3361  NA 244    15.9 386.34
## 258  0.61154  20.0  3.97    0 0.6470 8.704    NA  1.8010   5 264    13.0     NA
## 259       NA  20.0    NA    0 0.6470 7.333 100.0      NA   5 264    13.0 383.29
## 260  0.65665  20.0  3.97    0 0.6470    NA    NA  2.0107   5  NA    13.0 391.93
## 261  0.54011  20.0  3.97    0 0.6470 7.203  81.8  2.1121  NA 264    13.0 392.80
## 262  0.53412  20.0  3.97    0 0.6470 7.520  89.4  2.1398   5 264    13.0 388.37
## 263  0.52014  20.0  3.97    0 0.6470 8.398  91.5  2.2885   5 264    13.0 386.86
## 264  0.82526  20.0  3.97    0 0.6470 7.327  94.5  2.0788   5 264    13.0 393.42
## 265  0.55007  20.0  3.97    0     NA    NA  91.6  1.9301   5 264    13.0 387.89
## 266  0.76162  20.0  3.97   NA 0.6470 5.560  62.8  1.9865   5 264    13.0 392.40
## 267  0.78570  20.0  3.97    0     NA 7.014  84.6  2.1329   5 264    13.0 384.07
## 268  0.57834    NA  3.97   NA 0.5750    NA  67.0  2.4216   5  NA    13.0 384.54
## 269  0.54050    NA  3.97    0 0.5750 7.470  52.6  2.8720   5  NA    13.0 390.30
## 270  0.09065  20.0  6.96    1 0.4640 5.920    NA      NA  NA 223    18.6     NA
## 271  0.29916    NA  6.96    0 0.4640 5.856    NA      NA   3 223    18.6 388.65
## 272  0.16211  20.0  6.96    0 0.4640 6.240  16.3  4.4290   3 223    18.6 396.90
## 273  0.11460  20.0  6.96   NA 0.4640 6.538  58.7  3.9175   3  NA    18.6 394.96
## 274  0.22188  20.0  6.96    1 0.4640 7.691  51.8  4.3665   3 223      NA     NA
## 275  0.05644  40.0    NA    1 0.4470 6.758  32.9  4.0776  NA 254    17.6 396.90
## 276  0.09604  40.0  6.41    0 0.4470 6.854  42.8  4.2673   4 254    17.6     NA
## 277  0.10469  40.0  6.41    1     NA    NA  49.0  4.7872   4 254    17.6 389.25
## 278  0.06127    NA  6.41    1 0.4470 6.826  27.6  4.8628   4 254    17.6 393.45
## 279       NA  40.0  6.41    0 0.4470 6.482  32.1  4.1403   4 254    17.6 396.90
## 280       NA  20.0  3.33    0 0.4429 6.812  32.2  4.1007   5  NA    14.9 396.90
## 281       NA  20.0  3.33    0 0.4429 7.820  64.5  4.6947   5 216      NA 387.31
## 282  0.03705  20.0  3.33    0 0.4429 6.968  37.2  5.2447   5 216    14.9 392.23
## 283  0.06129    NA  3.33    1 0.4429 7.645  49.7  5.2119   5 216    14.9     NA
## 284       NA  90.0  1.21   NA 0.4010 7.923  24.8  5.8850   1 198    13.6 395.52
## 285  0.00906  90.0  2.97    0 0.4000 7.088  20.8  7.3073   1 285    15.3 394.72
## 286  0.01096  55.0  2.25   NA 0.3890 6.453    NA  7.3073   1 300    15.3 394.72
## 287  0.01965  80.0  1.76    0 0.3850 6.230  31.5  9.0892   1 241    18.2 341.60
## 288  0.03871  52.5  5.32    0 0.4050 6.209  31.3      NA  NA 293    16.6 396.90
## 289  0.04590  52.5  5.32    0 0.4050 6.315  45.6  7.3172  NA 293    16.6 396.90
## 290  0.04297    NA  5.32    0 0.4050 6.565  22.9      NA   6 293    16.6 371.72
## 291  0.03502  80.0  4.95    0 0.4110    NA  27.9  5.1167   4 245    19.2 396.90
## 292  0.07886  80.0  4.95    0 0.4110 7.148  27.7  5.1167   4 245    19.2 396.90
## 293  0.03615  80.0  4.95    0 0.4110 6.630  23.4  5.1167   4 245    19.2 396.90
## 294  0.08265   0.0 13.92    0 0.4370 6.127  18.4  5.5027   4 289    16.0 396.90
## 295       NA   0.0    NA    0 0.4370 6.009  42.3  5.5027   4 289    16.0 396.90
## 296  0.12932   0.0    NA    0 0.4370 6.678  31.1  5.9604   4 289    16.0     NA
## 297  0.05372   0.0 13.92    0 0.4370 6.549  51.0  5.9604   4 289    16.0 392.85
## 298  0.14103   0.0 13.92    0 0.4370 5.790  58.0  6.3200   4 289    16.0 396.90
## 299  0.06466  70.0  2.24    0 0.4000 6.345    NA  7.8278   5 358    14.8 368.24
## 300  0.05561  70.0  2.24    0 0.4000 7.041  10.0  7.8278   5 358    14.8 371.58
## 301  0.04417  70.0  2.24    0     NA 6.871    NA  7.8278  NA 358    14.8 390.86
## 302  0.03537  34.0  6.09    0 0.4330 6.590  40.4  5.4917   7 329    16.1 395.75
```

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## 303  0.09266  34.0  6.09    0 0.4330 6.495  18.4  5.4917   7 329    16.1 383.61
## 304  0.10000  34.0  6.09    0 0.4330 6.982  17.7  5.4917   7 329    16.1 390.43
## 305  0.05515  33.0    NA    0 0.4720 7.236    NA  4.0220   7  NA      NA 393.68
## 306  0.05479  33.0  2.18    0 0.4720 6.616  58.1  3.3700   7 222    18.4 393.36
## 307  0.07503  33.0  2.18    0 0.4720 7.420  71.9  3.0992   7 222    18.4 396.90
## 308  0.04932  33.0    NA    0     NA 6.849  70.3  3.1827  NA 222    18.4 396.90
## 309       NA   0.0  9.90    0 0.5440 6.635  82.5  3.3175   4 304    18.4 396.90
## 310  0.34940   0.0    NA    0 0.5440 5.972  76.7  3.1025   4 304    18.4 396.24
## 311  2.63548   0.0  9.90    0 0.5440 4.973  37.8  2.5194   4 304    18.4 350.45
## 312  0.79041   0.0  9.90    0 0.5440 6.122  52.8  2.6403   4 304      NA 396.90
## 313  0.26169   0.0  9.90    0 0.5440    NA  90.4  2.8340   4 304      NA 396.30
## 314  0.26938   0.0  9.90    0 0.5440 6.266  82.8  3.2628  NA 304    18.4 393.39
## 315  0.36920   0.0  9.90    0 0.5440 6.567  87.3  3.6023   4 304    18.4 395.69
## 316  0.25356    NA  9.90    0 0.5440 5.705  77.7  3.9450   4 304    18.4 396.42
## 317  0.31827   0.0  9.90    0 0.5440 5.914    NA  3.9986   4 304      NA 390.70
## 318  0.24522   0.0  9.90    0 0.5440 5.782  71.7  4.0317   4 304    18.4 396.90
## 319  0.40202   0.0  9.90    0 0.5440 6.382  67.2  3.5325   4 304    18.4 395.21
## 320  0.47547   0.0    NA    0 0.5440 6.113    NA  4.0019   4 304    18.4 396.23
## 321  0.16760   0.0    NA    0 0.4930 6.426    NA  4.5404   5 287    19.6 396.90
## 322       NA   0.0  7.38   NA 0.4930 6.376  54.3  4.5404   5  NA     19.6     NA
## 323  0.35114    NA  7.38    0 0.4930 6.041  49.9  4.7211   5 287    19.6 396.90
## 324  0.28392   0.0  7.38    0 0.4930 5.708    NA      NA   5 287    19.6 391.13
## 325  0.34109    NA    NA    0 0.4930 6.415  40.1  4.7211   5 287      NA 396.90
## 326  0.19186   0.0  7.38    0 0.4930 6.431  14.7  5.4159   5 287    19.6 393.68
## 327  0.30347   0.0  7.38    0     NA    NA  28.9  5.4159   5 287    19.6 396.90
## 328  0.24103    NA  7.38    0 0.4930 6.083  43.7  5.4159   5 287    19.6 396.90
## 329  0.06617   0.0  3.24    0 0.4600    NA  25.8  5.2146   4 430    16.9     NA
## 330  0.06724   0.0  3.24    0 0.4600    NA  17.2  5.2146   4 430    16.9 375.21
## 331  0.04544   0.0  3.24   NA 0.4600 6.144    NA  5.8736   4 430    16.9     NA
## 332  0.05023  35.0  6.06    0 0.4379 5.706  28.4  6.6407   1  NA    16.9 394.02
## 333  0.03466  35.0  6.06    0 0.4379 6.031  23.3  6.6407   1 304    16.9 362.25
## 334       NA   0.0  5.19    0 0.5150 6.316  38.1  6.4584   5 224      NA 389.71
## 335  0.03738   0.0  5.19    0 0.5150 6.310  38.5  6.4584   5 224    20.2 389.40
## 336  0.03961   0.0  5.19    0 0.5150 6.037  34.5  5.9853   5 224    20.2 396.90
## 337  0.03427   0.0  5.19    0 0.5150 5.869  46.3  5.2311  NA  NA    20.2 396.90
## 338  0.03041   0.0  5.19    0 0.5150 5.895  59.6  5.6150   5 224    20.2 394.81
## 339  0.03306   0.0  5.19    0 0.5150 6.059    NA  4.8122  NA 224      NA 396.14
## 340  0.05497   0.0  5.19    0 0.5150 5.985  45.4      NA   5 224    20.2 396.90
## 341  0.06151   0.0  5.19    0 0.5150 5.968  58.5  4.8122   5 224    20.2 396.90
## 342  0.01301  35.0  1.52    0 0.4420 7.241  49.3  7.0379   1 284    15.5 394.74
## 343  0.02498   0.0  1.89    0 0.5180 6.540  59.7      NA   1 422    15.9 389.96
## 344  0.02543  55.0  3.78    0 0.4840 6.696  56.4  5.7321   5 370    17.6 396.90
## 345  0.03049  55.0  3.78    0 0.4840    NA  28.1  6.4654   5 370    17.6 387.97
## 346       NA   0.0  4.39    0 0.4420 6.014  48.5  8.0136   3 352    18.8 385.64
## 347  0.06162   0.0  4.39    0 0.4420 5.898  52.3  8.0136   3 352    18.8 364.61
## 348  0.01870  85.0    NA    0 0.4290 6.516  27.7  8.5353   4 351    17.9 392.43
## 349  0.01501  80.0  2.01    0 0.4350 6.635  29.7  8.3440  NA 280    17.0 390.94
## 350  0.02899  40.0  1.25    0 0.4290 6.939  34.5  8.7921   1 335    19.7 389.85
## 351  0.06211  40.0  1.25    0 0.4290    NA  44.4  8.7921   1 335      NA 396.90
## 352  0.07950  60.0  1.69    0 0.4110    NA  35.9 10.7103   4 411    18.3 370.78
## 353  0.07244  60.0  1.69   NA     NA 5.884  18.5 10.7103   4 411    18.3 392.33
## 354  0.01709  90.0  2.02   NA 0.4100 6.728  36.1 12.1265   5 187    17.0 384.46
## 355  0.04301  80.0  1.91    0 0.4130 5.663  21.9 10.5857   4 334    22.0 382.80
## 356  0.10659  80.0    NA   NA 0.4130 5.936  19.5 10.5857   4 334    22.0 376.04
```

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## 357  8.98296   0.0 18.10   NA 0.7700 6.212  97.4  2.1222  24 666    20.2 377.73
## 358  3.84970   0.0 18.10   NA 0.7700 6.395  91.0  2.5052  24 666      NA 391.34
## 359  5.20177   0.0 18.10   NA 0.7700 6.127  83.4  2.7227  24 666    20.2     NA
## 360  4.26131   0.0 18.10    0 0.7700 6.112  81.3  2.5091  24 666    20.2 390.74
## 361  4.54192   0.0 18.10    0 0.7700 6.398  88.0  2.5182  24 666    20.2 374.56
## 362       NA   0.0 18.10    0 0.7700 6.251  91.1  2.2955  24 666      NA     NA
## 363  3.67822   0.0 18.10    0 0.7700 5.362  96.2  2.1036  24 666    20.2 380.79
## 364  4.22239   0.0 18.10    1 0.7700 5.803    NA  1.9047  24  NA    20.2 353.04
## 365  3.47428   0.0 18.10    1 0.7180 8.780  82.9  1.9047  24 666    20.2 354.55
## 366  4.55587    NA 18.10    0 0.7180 3.561  87.9  1.6132  24 666    20.2 354.70
## 367       NA   0.0 18.10    0 0.7180 4.963  91.4  1.7523  24 666    20.2 316.03
## 368 13.52220   0.0 18.10    0 0.6310 3.863    NA  1.5106  24 666    20.2 131.42
## 369  4.89822   0.0 18.10    0 0.6310 4.970 100.0  1.3325  24 666    20.2 375.52
## 370  5.66998   0.0 18.10    1 0.6310 6.683  96.8  1.3567  24 666    20.2 375.33
## 371  6.53876   0.0 18.10    1 0.6310 7.016  97.5  1.2024  24 666    20.2 392.05
## 372       NA   0.0 18.10    0     NA 6.216 100.0  1.1691  24 666    20.2 366.15
## 373  8.26725   0.0 18.10    1 0.6680 5.875  89.6  1.1296  24 666    20.2 347.88
## 374 11.10810    NA 18.10    0 0.6680    NA 100.0  1.1742  24 666      NA 396.90
## 375 18.49820   0.0 18.10    0 0.6680 4.138 100.0  1.1370  24 666    20.2 396.90
## 376 19.60910   0.0 18.10    0 0.6710 7.313  97.9  1.3163  24 666    20.2 396.90
## 377 15.28800   0.0 18.10   NA 0.6710 6.649  93.3  1.3449  24 666    20.2 363.02
## 378  9.82349   0.0 18.10    0 0.6710 6.794  98.8  1.3580  24 666    20.2 396.90
## 379 23.64820    NA 18.10    0 0.6710 6.380  96.2  1.3861  24 666    20.2     NA
## 380 17.86670   0.0 18.10    0 0.6710 6.223 100.0  1.3861  24 666    20.2 393.74
## 381 88.97620   0.0 18.10    0 0.6710 6.968  91.9  1.4165  24 666    20.2 396.90
## 382       NA   0.0 18.10    0 0.6710 6.545  99.1      NA  24 666    20.2 396.90
## 383  9.18702   0.0 18.10    0 0.7000    NA 100.0      NA  24 666    20.2     NA
## 384  7.99248   0.0 18.10    0 0.7000 5.520 100.0  1.5331  24 666    20.2     NA
## 385       NA   0.0 18.10    0 0.7000 4.368  91.2      NA  NA 666    20.2 285.83
## 386 16.81180   0.0 18.10    0 0.7000 5.277  98.1  1.4261  NA 666    20.2 396.90
## 387 24.39380   0.0 18.10   NA 0.7000 4.652 100.0  1.4672  NA 666    20.2     NA
## 388 22.59710   0.0 18.10    0 0.7000 5.000  89.5  1.5184  24 666    20.2 396.90
## 389 14.33370   0.0    NA   NA 0.7000 4.880 100.0  1.5895  NA 666    20.2 372.92
## 390  8.15174   0.0 18.10   NA 0.7000 5.390  98.9  1.7281  24 666    20.2 396.90
## 391  6.96215   0.0 18.10    0 0.7000 5.713  97.0  1.9265  NA 666    20.2 394.43
## 392  5.29305    NA    NA    0     NA 6.051  82.5  2.1678  24 666    20.2 378.38
## 393 11.57790   0.0 18.10    0 0.7000 5.036  97.0  1.7700  24 666      NA     NA
## 394  8.64476   0.0 18.10    0 0.6930 6.193  92.6  1.7912  24 666    20.2 396.90
## 395 13.35980   0.0 18.10    0     NA 5.887  94.7  1.7821  24  NA    20.2 396.90
## 396  8.71675   0.0 18.10    0     NA 6.471  98.8  1.7257  24 666    20.2 391.98
## 397  5.87205   0.0 18.10   NA 0.6930 6.405  96.0  1.6768  24  NA    20.2 396.90
## 398  7.67202   0.0 18.10    0     NA 5.747  98.9  1.6334  24 666    20.2 393.10
## 399 38.35180   0.0 18.10    0 0.6930    NA 100.0  1.4896  24 666    20.2 396.90
## 400  9.91655   0.0 18.10    0 0.6930 5.852  77.8  1.5004  24 666      NA 338.16
## 401 25.04610   0.0 18.10    0 0.6930 5.987 100.0  1.5888  24  NA    20.2 396.90
## 402 14.23620   0.0 18.10    0     NA 6.343 100.0  1.5741  24 666    20.2 396.90
## 403  9.59571   0.0 18.10    0 0.6930 6.404 100.0      NA  24 666    20.2 376.11
## 404 24.80170   0.0 18.10    0     NA 5.349  96.0  1.7028  24  NA    20.2 396.90
## 405 41.52920    NA 18.10    0 0.6930 5.531    NA  1.6074  24 666    20.2 329.46
## 406 67.92080   0.0 18.10    0 0.6930 5.683 100.0  1.4254  NA 666    20.2 384.97
## 407 20.71620   0.0 18.10    0 0.6590 4.138 100.0      NA  24 666    20.2 370.22
## 408 11.95110   0.0 18.10    0 0.6590 5.608 100.0  1.2852  24 666    20.2 332.09
## 409  7.40389   0.0 18.10    0 0.5970    NA  97.9  1.4547  24 666    20.2     NA
## 410 14.43830   0.0    NA    0     NA 6.852 100.0  1.4655  24 666    20.2 179.36
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## 411 51.13580   0.0 18.10    0 0.5970 5.757 100.0  1.4130  24 666    20.2   2.60
## 412 14.05070   0.0 18.10    0 0.5970 6.657 100.0  1.5275  24 666    20.2  35.05
## 413 18.81100   0.0 18.10    0 0.5970    NA 100.0  1.5539  24 666    20.2  28.79
## 414 28.65580   0.0 18.10    0 0.5970 5.155 100.0  1.5894  24 666    20.2     NA
## 415 45.74610   0.0 18.10    0     NA 4.519 100.0  1.6582  24 666    20.2  88.27
## 416 18.08460   0.0 18.10    0 0.6790 6.434 100.0  1.8347  24 666    20.2  27.25
## 417 10.83420   0.0 18.10    0 0.6790 6.782  90.8  1.8195  24 666    20.2  21.57
## 418 25.94060    NA 18.10    0     NA 5.304  89.1  1.6475  24 666    20.2 127.36
## 419 73.53410   0.0    NA    0 0.6790    NA 100.0  1.8026  24 666    20.2  16.45
## 420 11.81230   0.0    NA    0 0.7180 6.824  76.5  1.7940  24 666    20.2  48.45
## 421 11.08740   0.0 18.10   NA 0.7180 6.411 100.0  1.8589  24 666    20.2 318.75
## 422  7.02259    NA 18.10    0 0.7180 6.006  95.3  1.8746  24 666    20.2 319.98
## 423 12.04820   0.0 18.10    0     NA 5.648  87.6      NA  24 666    20.2 291.55
## 424  7.05042   0.0 18.10    0 0.6140 6.103  85.1  2.0218  24 666    20.2   2.52
## 425       NA   0.0 18.10    0 0.5840 5.565    NA  2.0635  24 666    20.2     NA
## 426 15.86030    NA 18.10    0 0.6790 5.896  95.4  1.9096  24 666    20.2   7.68
## 427 12.24720   0.0 18.10    0 0.5840 5.837  59.7  1.9976  24 666    20.2  24.65
## 428 37.66190   0.0 18.10    0     NA 6.202  78.7      NA  24 666    20.2  18.82
## 429  7.36711   0.0    NA    0 0.6790 6.193  78.1  1.9356  24 666      NA  96.73
## 430  9.33889   0.0 18.10    0 0.6790 6.380    NA  1.9682  24 666    20.2  60.72
## 431  8.49213   0.0 18.10    0 0.5840 6.348  86.1  2.0527  24 666    20.2  83.45
## 432 10.06230    NA    NA    0 0.5840 6.833  94.3  2.0882  24  NA    20.2  81.33
## 433  6.44405   0.0 18.10    0 0.5840 6.425  74.8  2.2004  24 666    20.2  97.95
## 434  5.58107   0.0 18.10    0 0.7130 6.436  87.9  2.3158  24 666    20.2 100.19
## 435 13.91340   0.0 18.10    0 0.7130    NA  95.0  2.2222  24 666    20.2 100.63
## 436 11.16040   0.0 18.10    0 0.7400 6.629  94.6  2.1247  24 666    20.2     NA
## 437 14.42080   0.0 18.10    0 0.7400 6.461  93.3  2.0026  NA 666    20.2  27.49
## 438 15.17720   0.0 18.10    0 0.7400 6.152 100.0  1.9142  24 666    20.2   9.32
## 439 13.67810   0.0 18.10    0 0.7400 5.935  87.9  1.8206  24 666    20.2  68.95
## 440  9.39063   0.0 18.10    0 0.7400 5.627  93.9  1.8172  24  NA    20.2 396.90
## 441 22.05110   0.0 18.10    0     NA 5.818    NA  1.8662  24  NA    20.2 391.45
## 442  9.72418   0.0    NA    0 0.7400 6.406  97.2  2.0651  24 666    20.2 385.96
## 443  5.66637   0.0    NA    0 0.7400 6.219 100.0  2.0048  24 666    20.2     NA
## 444  9.96654   0.0 18.10    0 0.7400 6.485 100.0  1.9784  NA 666      NA 386.73
## 445 12.80230   0.0 18.10    0 0.7400 5.854  96.6  1.8956  24 666    20.2     NA
## 446 10.67180   0.0 18.10    0 0.7400 6.459    NA  1.9879  24 666      NA  43.06
## 447  6.28807   0.0 18.10   NA 0.7400 6.341  96.4      NA  NA 666    20.2 318.01
## 448  9.92485   0.0 18.10   NA 0.7400 6.251  96.6  2.1980  24 666      NA 388.52
## 449  9.32909   0.0 18.10    0 0.7130 6.185  98.7  2.2616  24 666    20.2 396.90
## 450  7.52601   0.0 18.10    0 0.7130 6.417    NA  2.1850  24 666      NA 304.21
## 451  6.71772   0.0 18.10    0 0.7130 6.749  92.6  2.3236  24 666    20.2   0.32
## 452  5.44114   0.0 18.10    0 0.7130 6.655  98.2  2.3552  24 666    20.2 355.29
## 453  5.09017    NA 18.10    0 0.7130 6.297  91.8  2.3682  24 666    20.2     NA
## 454  8.24809   0.0 18.10    0     NA 7.393  99.3  2.4527  NA 666      NA 375.87
## 455  9.51363   0.0 18.10   NA 0.7130    NA  94.1  2.4961  24 666    20.2   6.68
## 456  4.75237   0.0 18.10    0 0.7130 6.525  86.5  2.4358  24 666    20.2  50.92
## 457  4.66883   0.0    NA    0 0.7130 5.976  87.9  2.5806  24 666    20.2     NA
## 458  8.20058   0.0 18.10    0 0.7130 5.936  80.3  2.7792  24 666    20.2   3.50
## 459  7.75223   0.0 18.10    0 0.7130 6.301  83.7  2.7831  24 666    20.2 272.21
## 460  6.80117    NA 18.10    0 0.7130 6.081  84.4  2.7175  24 666      NA 396.90
## 461  4.81213   0.0 18.10   NA     NA 6.701  90.0  2.5975  24 666    20.2 255.23
## 462  3.69311   0.0 18.10    0 0.7130 6.376  88.4  2.5671  24 666    20.2 391.43
## 463  6.65492   0.0    NA    0     NA    NA  83.0  2.7344  24 666    20.2 396.90
## 464  5.82115   0.0 18.10    0 0.7130 6.513  89.9  2.8016  24 666    20.2 393.82
```

```
## 465  7.83932   0.0 18.10    0 0.6550 6.209  65.4  2.9634  24  NA    20.2 396.90
## 466  3.16360   0.0    NA   NA 0.6550 5.759  48.2  3.0665  NA 666    20.2 334.40
## 467  3.77498   0.0 18.10    0 0.6550 5.952  84.7  2.8715  24 666    20.2  22.01
## 468  4.42228   0.0    NA    0 0.5840    NA  94.5  2.5403  NA  NA    20.2 331.29
## 469 15.57570   0.0    NA    0 0.5800 5.926  71.0  2.9084  24 666    20.2 368.74
## 470 13.07510   0.0 18.10    0 0.5800 5.713  56.7  2.8237  24 666    20.2 396.90
## 471  4.34879   0.0 18.10    0 0.5800 6.167    NA  3.0334  24 666      NA 396.90
## 472  4.03841    NA 18.10    0 0.5320 6.229  90.7  3.0993  NA 666    20.2 395.33
## 473  3.56868   0.0 18.10    0 0.5800 6.437  75.0  2.8965  24 666    20.2 393.37
## 474  4.64689   0.0 18.10    0 0.6140 6.980  67.6  2.5329  24 666      NA 374.68
## 475  8.05579   0.0 18.10   NA 0.5840 5.427  95.4  2.4298  24 666    20.2     NA
## 476  6.39312   0.0 18.10    0 0.5840 6.162  97.4  2.2060  24 666    20.2 302.76
## 477  4.87141   0.0 18.10    0     NA 6.484  93.6  2.3053  24 666      NA     NA
## 478 15.02340   0.0 18.10    0     NA 5.304  97.3      NA  NA 666    20.2     NA
## 479 10.23300   0.0    NA    0 0.6140 6.185  96.7  2.1705  NA 666    20.2 379.70
## 480 14.33370   0.0 18.10    0 0.6140 6.229  88.0  1.9512  24  NA      NA 383.32
## 481  5.82401   0.0    NA    0 0.5320 6.242  64.7      NA  24 666    20.2 396.90
## 482  5.70818   0.0 18.10    0 0.5320 6.750  74.9      NA  24 666      NA 393.07
## 483  5.73116   0.0 18.10    0 0.5320    NA    NA  3.4106  NA 666      NA 395.28
## 484  2.81838    NA    NA    0 0.5320 5.762  40.3  4.0983  24  NA      NA 392.92
## 485  2.37857   0.0 18.10    0 0.5830 5.871  41.9  3.7240  24 666    20.2     NA
## 486  3.67367   0.0 18.10    0 0.5830    NA  51.9  3.9917  24  NA    20.2 388.62
## 487  5.69175   0.0 18.10    0 0.5830 6.114  79.8  3.5459  24 666    20.2 392.68
## 488  4.83567   0.0 18.10    0     NA 5.905  53.2  3.1523  24 666      NA 388.22
## 489  0.15086   0.0 27.74    0 0.6090 5.454  92.7  1.8209   4 711    20.1 395.09
## 490  0.18337   0.0 27.74    0 0.6090 5.414  98.3  1.7554   4 711    20.1 344.05
## 491  0.20746   0.0 27.74    0     NA    NA  98.0  1.8226   4  NA    20.1 318.43
## 492  0.10574   0.0 27.74    0 0.6090 5.983  98.8      NA   4 711    20.1 390.11
## 493  0.11132   0.0 27.74    0 0.6090 5.983  83.5  2.1099   4 711    20.1 396.90
## 494  0.17331   0.0  9.69    0 0.5850 5.707    NA      NA   6 391    19.2 396.90
## 495  0.27957   0.0  9.69    0 0.5850 5.926    NA  2.3817   6 391    19.2 396.90
## 496       NA   0.0  9.69   NA 0.5850    NA  28.8  2.7986   6 391    19.2 393.29
## 497  0.28960   0.0  9.69    0 0.5850 5.390  72.9  2.7986   6 391    19.2 396.90
## 498  0.26838   0.0    NA    0 0.5850    NA  70.6  2.8927   6 391    19.2 396.90
## 499  0.23912   0.0  9.69    0 0.5850 6.019  65.3  2.4091   6 391    19.2 396.90
## 500  0.17783   0.0  9.69   NA 0.5850 5.569  73.5      NA   6 391    19.2 395.77
## 501  0.22438   0.0  9.69    0 0.5850 6.027  79.7  2.4982   6 391    19.2 396.90
## 502  0.06263   0.0 11.93    0 0.5730 6.593  69.1      NA   1 273    21.0 391.99
## 503  0.04527   0.0 11.93    0 0.5730 6.120  76.7  2.2875   1 273    21.0 396.90
## 504  0.06076   0.0 11.93    0     NA    NA  91.0  2.1675   1 273    21.0     NA
## 505  0.10959    NA 11.93    0 0.5730 6.794  89.3  2.3889   1 273    21.0 393.45
## 506  0.04741   0.0 11.93    0 0.5730    NA    NA  2.5050   1 273    21.0     NA
##     lstat
## 1    4.98
## 2    9.14
## 3      NA
## 4    2.94
## 5    5.33
## 6    5.21
## 7   12.43
## 8   19.15
## 9   29.93
## 10  17.10
## 11  20.45
```

```
## 12  13.27
## 13  15.71
## 14   8.26
## 15  10.26
## 16   8.47
## 17   6.58
## 18     NA
## 19  11.69
## 20  11.28
## 21  21.02
## 22  13.83
## 23  18.72
## 24  19.88
## 25  16.30
## 26  16.51
## 27  14.81
## 28  17.28
## 29  12.80
## 30  11.98
## 31  22.60
## 32  13.04
## 33  27.71
## 34  18.35
## 35  20.34
## 36   9.68
## 37  11.41
## 38   8.77
## 39  10.13
## 40   4.32
## 41   1.98
## 42   4.84
## 43   5.81
## 44   7.44
## 45   9.55
## 46  10.21
## 47  14.15
## 48  18.80
## 49     NA
## 50  16.20
## 51  13.45
## 52   9.43
## 53   5.28
## 54   8.43
## 55  14.80
## 56   4.81
## 57   5.77
## 58   3.95
## 59   6.86
## 60   9.22
## 61  13.15
## 62  14.44
## 63   6.73
## 64   9.50
## 65   8.05
```

```
## 66   4.67
## 67  10.24
## 68   8.10
## 69  13.09
## 70   8.79
## 71   6.72
## 72   9.88
## 73   5.52
## 74     NA
## 75   6.78
## 76   8.94
## 77  11.97
## 78     NA
## 79     NA
## 80   9.10
## 81   5.29
## 82   7.22
## 83   6.72
## 84   7.51
## 85     NA
## 86   6.53
## 87  12.86
## 88   8.44
## 89   5.50
## 90   5.70
## 91   8.81
## 92   8.20
## 93   8.16
## 94     NA
## 95  10.59
## 96     NA
## 97  11.34
## 98     NA
## 99   3.57
## 100  6.19
## 101  9.42
## 102  7.67
## 103 10.63
## 104 13.44
## 105 12.33
## 106 16.47
## 107    NA
## 108 14.09
## 109 12.27
## 110 15.55
## 111 13.00
## 112 10.16
## 113 16.21
## 114 17.09
## 115 10.45
## 116 15.76
## 117 12.04
## 118 10.30
## 119 15.37
```

```
## 120 13.61
## 121 14.37
## 122 14.27
## 123 17.93
## 124 25.41
## 125 17.58
## 126 14.81
## 127 27.26
## 128    NA
## 129 15.39
## 130    NA
## 131 12.60
## 132 12.26
## 133 11.12
## 134 15.03
## 135 17.31
## 136 16.96
## 137 16.90
## 138 14.59
## 139 21.32
## 140 18.46
## 141 24.16
## 142 34.41
## 143 26.82
## 144 26.42
## 145 29.29
## 146 27.80
## 147 16.65
## 148 29.53
## 149 28.32
## 150 21.45
## 151 14.10
## 152 13.28
## 153 12.12
## 154    NA
## 155 15.12
## 156 15.02
## 157 16.14
## 158    NA
## 159    NA
## 160  7.39
## 161  5.50
## 162  1.73
## 163  1.92
## 164  3.32
## 165 11.64
## 166  9.81
## 167  3.70
## 168 12.14
## 169 11.10
## 170 11.32
## 171 14.43
## 172 12.03
## 173 14.69
```

```
## 174  9.04
## 175  9.64
## 176  5.33
## 177 10.11
## 178  6.29
## 179  6.92
## 180  5.04
## 181  7.56
## 182  9.45
## 183    NA
## 184  5.68
## 185    NA
## 186 13.15
## 187  4.45
## 188  6.68
## 189  4.56
## 190  5.39
## 191  5.10
## 192  4.69
## 193  2.87
## 194  5.03
## 195  4.38
## 196  2.97
## 197  4.08
## 198  8.61
## 199  6.62
## 200  4.56
## 201  4.45
## 202  7.43
## 203  3.11
## 204  3.81
## 205    NA
## 206 10.87
## 207 10.97
## 208 18.06
## 209 14.66
## 210    NA
## 211 17.27
## 212 23.98
## 213 16.03
## 214    NA
## 215 29.55
## 216  9.47
## 217 13.51
## 218  9.69
## 219 17.92
## 220 10.50
## 221  9.71
## 222 21.46
## 223  9.93
## 224  7.60
## 225    NA
## 226  4.63
## 227  3.13
```

```
## 228  6.36
## 229  3.92
## 230  3.76
## 231 11.65
## 232  5.25
## 233  2.47
## 234  3.95
## 235  8.05
## 236 10.88
## 237  9.54
## 238  4.73
## 239  6.36
## 240  7.37
## 241 11.38
## 242 12.40
## 243 11.22
## 244  5.19
## 245 12.50
## 246    NA
## 247  9.16
## 248    NA
## 249  9.52
## 250  6.56
## 251  5.90
## 252  3.59
## 253  3.53
## 254  3.54
## 255  6.57
## 256  9.25
## 257  3.11
## 258  5.12
## 259  7.79
## 260  6.90
## 261  9.59
## 262  7.26
## 263  5.91
## 264 11.25
## 265  8.10
## 266 10.45
## 267 14.79
## 268  7.44
## 269    NA
## 270 13.65
## 271 13.00
## 272  6.59
## 273  7.73
## 274  6.58
## 275  3.53
## 276  2.98
## 277  6.05
## 278  4.16
## 279  7.19
## 280  4.85
## 281  3.76
```

```
## 282  4.59
## 283    NA
## 284  3.16
## 285  7.85
## 286  8.23
## 287 12.93
## 288    NA
## 289  7.60
## 290  9.51
## 291  3.33
## 292  3.56
## 293  4.70
## 294  8.58
## 295 10.40
## 296  6.27
## 297  7.39
## 298 15.84
## 299  4.97
## 300  4.74
## 301  6.07
## 302  9.50
## 303  8.67
## 304  4.86
## 305    NA
## 306  8.93
## 307  6.47
## 308  7.53
## 309  4.54
## 310  9.97
## 311 12.64
## 312  5.98
## 313 11.72
## 314  7.90
## 315  9.28
## 316 11.50
## 317 18.33
## 318 15.94
## 319 10.36
## 320 12.73
## 321  7.20
## 322  6.87
## 323  7.70
## 324 11.74
## 325    NA
## 326  5.08
## 327  6.15
## 328 12.79
## 329  9.97
## 330  7.34
## 331  9.09
## 332 12.43
## 333  7.83
## 334  5.68
## 335  6.75
```

```
## 336  8.01
## 337  9.80
## 338 10.56
## 339  8.51
## 340  9.74
## 341  9.29
## 342  5.49
## 343  8.65
## 344  7.18
## 345  4.61
## 346 10.53
## 347 12.67
## 348  6.36
## 349  5.99
## 350  5.89
## 351  5.98
## 352    NA
## 353  7.79
## 354  4.50
## 355    NA
## 356    NA
## 357 17.60
## 358 13.27
## 359 11.48
## 360 12.67
## 361  7.79
## 362 14.19
## 363 10.19
## 364    NA
## 365  5.29
## 366  7.12
## 367 14.00
## 368 13.33
## 369  3.26
## 370  3.73
## 371  2.96
## 372  9.53
## 373  8.88
## 374 34.77
## 375 37.97
## 376 13.44
## 377 23.24
## 378 21.24
## 379 23.69
## 380 21.78
## 381 17.21
## 382 21.08
## 383 23.60
## 384 24.56
## 385 30.63
## 386 30.81
## 387 28.28
## 388 31.99
## 389 30.62
```

```
## 390 20.85
## 391 17.11
## 392 18.76
## 393    NA
## 394 15.17
## 395    NA
## 396 17.12
## 397 19.37
## 398 19.92
## 399    NA
## 400 29.97
## 401 26.77
## 402 20.32
## 403 20.31
## 404    NA
## 405 27.38
## 406 22.98
## 407 23.34
## 408 12.13
## 409 26.40
## 410 19.78
## 411 10.11
## 412    NA
## 413 34.37
## 414 20.08
## 415 36.98
## 416 29.05
## 417    NA
## 418 26.64
## 419 20.62
## 420 22.74
## 421 15.02
## 422 15.70
## 423 14.10
## 424 23.29
## 425 17.16
## 426 24.39
## 427 15.69
## 428 14.52
## 429 21.52
## 430 24.08
## 431 17.64
## 432 19.69
## 433 12.03
## 434    NA
## 435 15.17
## 436 23.27
## 437 18.05
## 438 26.45
## 439 34.02
## 440 22.88
## 441    NA
## 442 19.52
## 443 16.59
```

```
## 444 18.85
## 445 23.79
## 446 23.98
## 447 17.79
## 448 16.44
## 449 18.13
## 450    NA
## 451 17.44
## 452 17.73
## 453 17.27
## 454 16.74
## 455 18.71
## 456 18.13
## 457 19.01
## 458    NA
## 459    NA
## 460 14.70
## 461 16.42
## 462 14.65
## 463 13.99
## 464    NA
## 465 13.22
## 466 14.13
## 467 17.15
## 468 21.32
## 469 18.13
## 470 14.76
## 471    NA
## 472 12.87
## 473    NA
## 474 11.66
## 475 18.14
## 476 24.10
## 477 18.68
## 478 24.91
## 479 18.03
## 480 13.11
## 481 10.74
## 482  7.74
## 483  7.01
## 484 10.42
## 485 13.34
## 486 10.58
## 487 14.98
## 488 11.45
## 489 18.06
## 490 23.97
## 491    NA
## 492 18.07
## 493 13.35
## 494 12.01
## 495 13.59
## 496 17.60
## 497 21.14
```

```
## 498 14.10
## 499 12.92
## 500 15.10
## 501 14.33
## 502  9.67
## 503  9.08
## 504  5.64
## 505  6.48
## 506  7.88
```

Use a random forest modeling procedure to iteratively fill in the `NA`'s by predicting each feature of X using every other feature of X. You need to start by filling in the holes to use RF. So fill them in with the average of the feature.

```
pacman::p_load(missForest)
Ximp = missForest(data.frame(Xmiss))$ximp
```

```
##   missForest iteration 1 in progress...

## Warning in randomForest.default(x = obsX, y = obsY, ntree = ntree, mtry =
## mtry, : The response has five or fewer unique values. Are you sure you want to
## do regression?

## done!
##   missForest iteration 2 in progress...

## Warning in randomForest.default(x = obsX, y = obsY, ntree = ntree, mtry =
## mtry, : The response has five or fewer unique values. Are you sure you want to
## do regression?

## done!
##   missForest iteration 3 in progress...

## Warning in randomForest.default(x = obsX, y = obsY, ntree = ntree, mtry =
## mtry, : The response has five or fewer unique values. Are you sure you want to
## do regression?

## done!
##   missForest iteration 4 in progress...

## Warning in randomForest.default(x = obsX, y = obsY, ntree = ntree, mtry =
## mtry, : The response has five or fewer unique values. Are you sure you want to
## do regression?

## done!
##   missForest iteration 5 in progress...

## Warning in randomForest.default(x = obsX, y = obsY, ntree = ntree, mtry =
## mtry, : The response has five or fewer unique values. Are you sure you want to
## do regression?
```

```
## done!
##   missForest iteration 6 in progress...

## Warning in randomForest.default(x = obsX, y = obsY, ntree = ntree, mtry =
## mtry, : The response has five or fewer unique values. Are you sure you want to
## do regression?

## done!
```

```
Ximp
```

```
##            crim            zn   indus          chas       nox       rm
## 1    0.00632000  1.800000e+01  2.3100  0.000000e+00 0.4544620 6.575000
## 2    0.02731000  0.000000e+00  7.0700  0.000000e+00 0.4690000 6.421000
## 3    0.02729000  0.000000e+00  7.0700  0.000000e+00 0.4690000 7.185000
## 4    0.03237000  0.000000e+00  2.1800  0.000000e+00 0.4580000 6.998000
## 5    0.06905000  0.000000e+00  2.1800  0.000000e+00 0.4580000 7.147000
## 6    0.02985000  0.000000e+00  2.1800  0.000000e+00 0.4550480 6.430000
## 7    0.08829000  1.250000e+01  7.6446  0.000000e+00 0.5240000 6.012000
## 8    0.27154844  1.250000e+01  7.8700  0.000000e+00 0.5240000 5.929815
## 9    0.21124000  1.250000e+01  7.8700  0.000000e+00 0.5240000 5.631000
## 10   0.17004000  1.250000e+01  7.8700  0.000000e+00 0.5240000 6.004000
## 11   0.22489000  1.250000e+01  7.8700  0.000000e+00 0.5240000 6.377000
## 12   0.11747000  1.153000e+01  7.8700  0.000000e+00 0.5240000 6.009000
## 13   0.09378000  6.760000e+00  8.2455  0.000000e+00 0.5240000 5.889000
## 14   0.65089604  0.000000e+00  8.1400 -9.298118e-17 0.5380000 5.949000
## 15   0.63796000  0.000000e+00  8.1400  0.000000e+00 0.5358100 6.096000
## 16   0.62739000  0.000000e+00  8.1400  0.000000e+00 0.5380000 5.834000
## 17   0.70916698  0.000000e+00  8.1400  0.000000e+00 0.5380000 5.935000
## 18   0.83675173  0.000000e+00  8.1400  0.000000e+00 0.5380000 5.990000
## 19   0.80271000  0.000000e+00  8.1400  0.000000e+00 0.5380000 5.456000
## 20   0.72580000  0.000000e+00  8.1400  0.000000e+00 0.5380000 5.727000
## 21   1.25179000  0.000000e+00  8.1400  0.000000e+00 0.5380000 5.570000
## 22   0.85204000  0.000000e+00  8.1400  0.000000e+00 0.5380000 5.965000
## 23   1.23247000  0.000000e+00  8.1400  0.000000e+00 0.5380000 5.805982
## 24   0.98843000  0.000000e+00  8.1400  0.000000e+00 0.5380000 5.813000
## 25   0.75026000  0.000000e+00  8.1400  0.000000e+00 0.5380000 5.924000
## 26   0.84054000 -9.947598e-15  8.1400  0.000000e+00 0.5384700 5.599000
## 27   0.67191000  0.000000e+00  8.1400  0.000000e+00 0.5380000 5.813000
## 28   0.95577000  0.000000e+00  8.1400  0.000000e+00 0.5380000 6.047000
## 29   0.77299000  0.000000e+00  8.1400  0.000000e+00 0.5380000 6.495000
## 30   1.00245000  0.000000e+00  8.1400  0.000000e+00 0.5380000 5.987060
## 31   1.13081000  0.000000e+00  8.1400  0.000000e+00 0.5380000 5.713000
## 32   1.35472000  0.000000e+00  8.1400  0.000000e+00 0.5380000 6.072000
## 33   1.38799000  0.000000e+00  8.1400  0.000000e+00 0.5380000 5.950000
## 34   1.15172000 -1.035616e-14  8.1400  0.000000e+00 0.5380000 5.701000
## 35   1.61282000  0.000000e+00  8.8043  0.000000e+00 0.5380000 6.096000
## 36   0.06417000  0.000000e+00  5.9600  0.000000e+00 0.4990000 5.933000
## 37   0.09744000  0.000000e+00  5.9600  0.000000e+00 0.4990000 5.841000
## 38   0.08014000  0.000000e+00  5.9600  0.000000e+00 0.4990000 5.850000
## 39   0.17505000  0.000000e+00  5.9600  0.000000e+00 0.4990000 5.966000
## 40   0.02763000  4.686500e+01  3.8962  0.000000e+00 0.4280000 6.595000
## 41   0.03359000  4.962500e+01  3.8866  0.000000e+00 0.4280000 6.842240
```

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## 42   0.12744000  0.000000e+00  6.9100  7.000000e-02 0.4480000 6.770000
## 43   0.14150000  0.000000e+00  7.1136  0.000000e+00 0.4480000 6.169000
## 44   0.15936000  0.000000e+00  6.9100  0.000000e+00 0.4480000 6.211000
## 45   0.12269000  0.000000e+00  6.9100  0.000000e+00 0.4480000 6.069000
## 46   0.17142000  0.000000e+00  6.9100  0.000000e+00 0.4480000 5.682000
## 47   0.18836000  0.000000e+00  6.9100  0.000000e+00 0.4480000 5.786000
## 48   0.22927000  0.000000e+00  6.9100  0.000000e+00 0.4480000 6.030000
## 49   0.25387000  0.000000e+00  6.9100  0.000000e+00 0.4480000 5.399000
## 50   0.21977000  0.000000e+00  6.9100  0.000000e+00 0.4559610 5.602000
## 51   0.08873000  2.100000e+01  5.6400  0.000000e+00 0.4390000 5.963000
## 52   0.04337000  2.100000e+01  5.6400  0.000000e+00 0.4390000 6.115000
## 53   0.05360000  2.100000e+01  5.6400  0.000000e+00 0.4390000 6.511000
## 54   0.06530745  2.100000e+01  5.6400  0.000000e+00 0.4390000 5.998000
## 55   0.37680984  7.500000e+01  4.0000  0.000000e+00 0.4100000 6.178420
## 56   0.01311000  9.000000e+01  1.2200  0.000000e+00 0.4030000 7.249000
## 57   0.04351640  8.500000e+01  3.0189  3.000000e-02 0.4100000 6.383000
## 58   0.01432000  1.000000e+02  1.3200  0.000000e+00 0.4110000 6.816000
## 59   0.15445000  2.500000e+01  5.1300  0.000000e+00 0.4530000 6.145000
## 60   0.10328000  2.500000e+01  5.1300  0.000000e+00 0.4530000 5.927000
## 61   0.14932000  2.500000e+01  5.1300  0.000000e+00 0.4530000 5.741000
## 62   0.17171000  2.500000e+01  5.1300  0.000000e+00 0.4530000 5.966000
## 63   0.11027000  2.500000e+01  5.7125  0.000000e+00 0.4530000 6.456000
## 64   0.12650000  2.500000e+01  5.1300  0.000000e+00 0.4530000 6.762000
## 65   0.01951000  1.750000e+01  1.3800  4.000000e-02 0.4161000 7.104000
## 66   0.03584000  8.000000e+01  3.3700  0.000000e+00 0.3980000 6.290000
## 67   0.04379000  8.000000e+01  3.3700  0.000000e+00 0.3980000 5.787000
## 68   0.12134800  1.250000e+01  6.0700  0.000000e+00 0.4090000 5.878000
## 69   0.13554000  1.250000e+01  6.0700  1.000000e-02 0.4090000 5.594000
## 70   0.12816000  1.250000e+01  6.0700 -7.452372e-17 0.4090000 5.885000
## 71   0.08826000  0.000000e+00 10.8100  0.000000e+00 0.4130000 6.417000
## 72   0.15876000  0.000000e+00 10.8100  0.000000e+00 0.4130000 6.104300
## 73   0.09164000  0.000000e+00  8.4091  0.000000e+00 0.4130000 6.468047
## 74   0.19539000  0.000000e+00 10.8100  0.000000e+00 0.4130000 6.245000
## 75   0.07896000  0.000000e+00 12.8300  0.000000e+00 0.4370000 6.273000
## 76   0.09512000  0.000000e+00 12.8300  0.000000e+00 0.4370000 6.286000
## 77   0.10153000  0.000000e+00 12.8300  0.000000e+00 0.4370000 6.279000
## 78   0.08707000  0.000000e+00 12.8300  0.000000e+00 0.4370000 6.140000
## 79   0.11497774  0.000000e+00 12.8300  0.000000e+00 0.4370000 6.232000
## 80   0.08387000  3.555000e+00 12.8300  0.000000e+00 0.4370000 5.874000
## 81   0.04113000  2.500000e+01  4.8600  0.000000e+00 0.4260000 6.630135
## 82   0.04462000  2.500000e+01  4.8600  0.000000e+00 0.4260000 6.619000
## 83   0.04987845  2.500000e+01  4.8600  0.000000e+00 0.4260000 6.302000
## 84   0.03551000  2.500000e+01  4.8600  0.000000e+00 0.4260000 6.167000
## 85   0.05059000  0.000000e+00  4.4900  0.000000e+00 0.4490000 6.487213
## 86   0.05735000  0.000000e+00  4.4900  0.000000e+00 0.4593315 6.630000
## 87   0.05188000  0.000000e+00  4.4900  0.000000e+00 0.4490000 6.015000
## 88   0.07151000  0.000000e+00  4.4900  0.000000e+00 0.4669200 6.292880
## 89   0.10511761  0.000000e+00  3.4100  0.000000e+00 0.4890000 7.007000
## 90   0.05302000  6.110000e+00  3.4100  0.000000e+00 0.4890000 7.079000
## 91   0.04684000  0.000000e+00  3.4100  0.000000e+00 0.4877600 6.434850
## 92   0.03932000  0.000000e+00  3.4100  0.000000e+00 0.4890000 6.405000
## 93   0.04203000  2.800000e+01 15.0400  0.000000e+00 0.4640000 6.442000
## 94   0.02875000  2.800000e+01 15.0400  0.000000e+00 0.4640000 6.314935
## 95   0.04294000  2.800000e+01 15.0400  0.000000e+00 0.4640000 6.249000
```

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## 96   0.12204000  0.000000e+00  2.8900  0.000000e+00 0.4450000 6.625000
## 97   0.11504000  0.000000e+00  2.8900  0.000000e+00 0.4450000 6.163000
## 98   0.12083000  0.000000e+00  2.8900  2.000000e-02 0.4450000 6.639570
## 99   0.08187000  0.000000e+00  2.8900  0.000000e+00 0.4450000 7.820000
## 100  0.06860000  0.000000e+00  2.8900  0.000000e+00 0.4450000 7.416000
## 101  0.14866000  0.000000e+00  8.5600  0.000000e+00 0.5200000 6.727000
## 102  0.11432000  0.000000e+00  8.5600  0.000000e+00 0.5200000 6.781000
## 103  0.22876000  0.000000e+00  8.5600  0.000000e+00 0.5200000 6.405000
## 104  0.21161000  0.000000e+00  8.5600  0.000000e+00 0.5200000 6.137000
## 105  0.13960000  0.000000e+00  8.5600  0.000000e+00 0.5200000 6.167000
## 106  0.13262000  0.000000e+00  8.5600  0.000000e+00 0.5200000 5.851000
## 107  1.20506586  0.000000e+00  8.5600  0.000000e+00 0.5200000 5.836000
## 108  0.13117000  0.000000e+00  8.5600  0.000000e+00 0.5200000 6.127000
## 109  0.35306715  0.000000e+00  8.5600  0.000000e+00 0.5200000 6.474000
## 110  0.26363000  0.000000e+00  8.5600  0.000000e+00 0.5200000 6.229000
## 111  0.10793000  0.000000e+00  8.5600  0.000000e+00 0.5200000 6.195000
## 112  0.10084000  0.000000e+00 10.0100  0.000000e+00 0.5470000 6.715000
## 113  0.12329000  0.000000e+00 10.0100  0.000000e+00 0.5470000 5.913000
## 114  0.22212000  0.000000e+00 10.0100  0.000000e+00 0.5470000 6.092000
## 115  0.14231000  0.000000e+00 10.0100  2.000000e-02 0.5470000 6.254000
## 116  0.17134000  0.000000e+00 10.0100  0.000000e+00 0.5531800 5.928000
## 117  0.13158000  0.000000e+00 10.0100  1.000000e-02 0.5470000 6.176000
## 118  0.15098000  0.000000e+00 10.0100  0.000000e+00 0.5470000 6.021000
## 119  0.13058000  0.000000e+00 10.0100  0.000000e+00 0.5470000 5.872000
## 120  0.14476000  0.000000e+00 10.0100  0.000000e+00 0.5470000 5.731000
## 121  0.27283477  0.000000e+00 25.6500  0.000000e+00 0.5810000 5.870000
## 122  0.07165000  0.000000e+00 25.6500  0.000000e+00 0.5810000 6.004000
## 123  0.09299000  0.000000e+00 25.6500  0.000000e+00 0.5785700 5.909590
## 124  0.15038000  0.000000e+00 25.6500  0.000000e+00 0.5810000 5.856000
## 125  0.09849000  0.000000e+00 25.6500  0.000000e+00 0.5798100 5.879000
## 126  0.16902000  0.000000e+00 25.6500  0.000000e+00 0.5810000 5.986000
## 127  0.38735000  0.000000e+00 25.6500  0.000000e+00 0.5810000 5.613000
## 128  0.25915000 -9.325873e-15 21.8900  2.000000e-02 0.6240000 5.693000
## 129  0.32543000  0.000000e+00 21.8900  0.000000e+00 0.6240000 6.431000
## 130  0.88125000  0.000000e+00 21.8900  0.000000e+00 0.6240000 5.637000
## 131  0.34006000  0.000000e+00 21.8900 -9.200973e-17 0.6240000 6.458000
## 132  1.19294000  0.000000e+00 21.8900  0.000000e+00 0.6240000 6.326000
## 133  0.59005000  0.000000e+00 21.8900  0.000000e+00 0.6240000 6.372000
## 134  0.32982000  0.000000e+00 21.8900  0.000000e+00 0.6240000 6.130923
## 135  0.87141745  0.000000e+00 21.8900  0.000000e+00 0.6240000 5.757000
## 136  0.38758361  0.000000e+00 21.8900  0.000000e+00 0.6240000 6.160018
## 137  0.32264000  0.000000e+00 22.3935  0.000000e+00 0.6240000 5.942000
## 138  0.35233000  0.000000e+00 21.8900  0.000000e+00 0.6240000 6.454000
## 139  0.24980000  0.000000e+00 21.8900  0.000000e+00 0.6240000 5.857000
## 140  0.54452000  0.000000e+00 21.8900  0.000000e+00 0.6240000 6.151000
## 141  0.29090000  0.000000e+00 21.8900  0.000000e+00 0.6240000 6.174000
## 142  6.07272533  1.250000e-01 21.8900  0.000000e+00 0.6240000 5.019000
## 143  3.32105000  0.000000e+00 19.5800  1.000000e+00 0.8710000 5.403000
## 144  4.09740000  0.000000e+00 19.5800  0.000000e+00 0.8710000 5.527053
## 145  3.22044603  0.000000e+00 19.5800  0.000000e+00 0.8710000 4.903000
## 146  2.37934000  0.000000e+00 19.5800  0.000000e+00 0.8710000 6.130000
## 147  2.15505000  0.000000e+00 19.5800  0.000000e+00 0.8710000 5.726727
## 148  2.36862000  0.000000e+00 19.5800  0.000000e+00 0.8710000 4.926000
## 149  2.33099000  0.000000e+00 19.5800  2.142941e-01 0.8710000 5.186000
```

```
## 150  2.73397000  0.000000e+00 19.5800  6.650000e-02 0.8309967 5.597000
## 151  1.97391921  0.000000e+00 19.5800  0.000000e+00 0.8710000 6.122000
## 152  1.49632000  0.000000e+00 19.5800  0.000000e+00 0.8710000 5.404000
## 153  1.12658000  0.000000e+00 19.5800  1.000000e+00 0.8710000 5.012000
## 154  2.14918000  0.000000e+00 19.5800  0.000000e+00 0.8269300 5.709000
## 155  1.41385000  0.000000e+00 19.5800  1.000000e+00 0.8710000 5.735822
## 156  3.53501000  0.000000e+00 19.5800  1.000000e+00 0.8710000 5.606982
## 157  2.44668000  0.000000e+00 19.5800  0.000000e+00 0.8710000 5.728077
## 158  1.22358000  0.000000e+00 19.5800  0.000000e+00 0.6050000 6.943000
## 159  2.52346347  0.000000e+00 19.5800  0.000000e+00 0.6050000 6.066000
## 160  1.42502000  0.000000e+00 19.5800  0.000000e+00 0.8710000 6.510000
## 161  1.27346000  0.000000e+00 19.5800  1.000000e+00 0.6975850 6.250000
## 162  1.46336000  0.000000e+00 19.5800  0.000000e+00 0.6050000 7.489000
## 163  1.83377000  0.000000e+00 19.5800  1.000000e+00 0.6050000 7.802000
## 164  1.51902000  0.000000e+00 19.4174  1.000000e+00 0.6050000 8.375000
## 165  2.24236000  0.000000e+00 19.5800  2.240000e-01 0.6050000 5.854000
## 166  2.92400000  0.000000e+00 19.5800  0.000000e+00 0.6050000 6.101000
## 167  2.01019000  0.000000e+00 19.5800  3.900000e-01 0.6050000 7.929000
## 168  1.99236470  0.000000e+00 19.5800  0.000000e+00 0.6050000 5.877000
## 169  2.30040000  0.000000e+00 19.5800  0.000000e+00 0.6050000 6.319000
## 170  2.44953000  0.000000e+00 19.5800  3.000000e-02 0.6050000 6.402000
## 171  1.20742000  0.000000e+00 19.5800  0.000000e+00 0.6050000 5.875000
## 172  2.31390000  0.000000e+00 19.5800  0.000000e+00 0.6050000 5.880000
## 173  0.13914000  0.000000e+00  4.0500  0.000000e+00 0.5100000 5.572000
## 174  0.09178000  0.000000e+00  4.0500  0.000000e+00 0.5100000 6.416000
## 175  0.08447000  0.000000e+00  4.0500  0.000000e+00 0.5100000 5.859000
## 176  0.06664000  0.000000e+00  4.0500  0.000000e+00 0.5100000 6.546000
## 177  0.07022000  2.045000e+00  4.0500  0.000000e+00 0.4925760 6.020000
## 178  0.05425000  0.000000e+00  6.6573  0.000000e+00 0.5100000 6.315000
## 179  0.06642000  0.000000e+00  4.0500  7.000000e-02 0.5100000 6.860000
## 180  0.05780000  0.000000e+00  2.4600  0.000000e+00 0.4880000 6.980000
## 181  0.06588000  0.000000e+00  2.4600  3.000000e-02 0.4880000 6.801015
## 182  0.06888000  0.000000e+00  2.4600  0.000000e+00 0.5019000 6.144000
## 183  0.09103000  0.000000e+00  2.4600  0.000000e+00 0.4880000 7.155000
## 184  0.10008000  2.770000e+00  2.4600  0.000000e+00 0.4880000 6.563000
## 185  0.08308000  0.000000e+00  2.4600  0.000000e+00 0.4880000 5.604000
## 186  0.06047000  0.000000e+00  5.4534  6.000000e-02 0.4880000 6.153000
## 187  0.05602000  0.000000e+00  4.1900  0.000000e+00 0.4880000 7.831000
## 188  0.07875000  4.500000e+01  3.4400  0.000000e+00 0.4514590 6.782000
## 189  0.12579000  4.500000e+01  3.4400  0.000000e+00 0.4370000 6.556000
## 190  0.08370000  4.500000e+01  3.4400  0.000000e+00 0.4370000 7.185000
## 191  0.09068000  4.500000e+01  3.4400  0.000000e+00 0.4379950 6.951000
## 192  0.06911000  4.500000e+01  3.4400  0.000000e+00 0.4370000 6.739000
## 193  0.07131700  4.500000e+01  3.4400  0.000000e+00 0.4370000 7.178000
## 194  0.03115623  6.000000e+01  2.9300  0.000000e+00 0.4010000 6.800000
## 195  0.01439000  7.686500e+01  2.9300  0.000000e+00 0.4010000 6.604000
## 196  0.01381000  8.000000e+01  0.4600  1.400000e-01 0.4220000 7.875000
## 197  0.04011000  8.000000e+01  1.5200  0.000000e+00 0.4040000 7.287000
## 198  0.04666000  8.000000e+01  1.5200  0.000000e+00 0.4040000 7.107000
## 199  0.03768000  8.000000e+01  1.5200  0.000000e+00 0.4040000 7.274000
## 200  0.03150000  9.500000e+01  1.4700  0.000000e+00 0.4030000 6.975000
## 201  0.01778000  9.500000e+01  1.4700  0.000000e+00 0.4030000 7.135000
## 202  0.03445000  8.250000e+01  2.0300 -4.163336e-17 0.4150000 6.900690
## 203  0.02177000  8.250000e+01  2.0300  0.000000e+00 0.4077630 7.610000
```

```
## 204  0.03510000  9.500000e+01  2.6800  0.000000e+00 0.4161000 7.853000
## 205  0.02009000  9.500000e+01  2.6800  2.600000e-01 0.4161000 7.556685
## 206  0.13642000  0.000000e+00 10.5900  0.000000e+00 0.4890000 5.891000
## 207  0.22969000  0.000000e+00 10.5900  0.000000e+00 0.4890000 6.326000
## 208  0.25199000  0.000000e+00 10.5900  0.000000e+00 0.4890000 5.783000
## 209  0.13587000  0.000000e+00 10.5900  2.100000e-01 0.4890000 5.927433
## 210  0.43571000  0.000000e+00 10.5900  1.000000e+00 0.4890000 5.344000
## 211  0.17446000  0.000000e+00 10.5900  1.000000e+00 0.4890000 5.805302
## 212  0.37578000  0.000000e+00 10.5900  1.000000e+00 0.4890000 5.404000
## 213  0.20955513  0.000000e+00 10.5900  1.000000e+00 0.4890000 5.807000
## 214  0.14052000  0.000000e+00 10.5900  0.000000e+00 0.4708113 6.375000
## 215  0.28955000  0.000000e+00 10.5900  0.000000e+00 0.4890000 5.412000
## 216  0.19802000  0.000000e+00 10.5900  8.333333e-02 0.4890000 6.182000
## 217  0.04560000  3.105000e+00 13.8900  2.600000e-01 0.5500000 5.888000
## 218  0.07013000  0.000000e+00 13.8900  0.000000e+00 0.5500000 6.642000
## 219  0.11069000  0.000000e+00 13.8900  1.000000e+00 0.5500000 5.951000
## 220  0.11425000  8.800000e-01 13.8900  1.000000e+00 0.5500000 6.373000
## 221  0.35809000  0.000000e+00  6.2000  1.000000e+00 0.5070000 6.951000
## 222  0.40771000  0.000000e+00  6.2000  1.000000e+00 0.5070000 6.164000
## 223  0.62356000  0.000000e+00  6.2000  1.000000e+00 0.5070000 6.879000
## 224  0.61470000  0.000000e+00  6.2000  0.000000e+00 0.5070000 6.618000
## 225  0.31533000  0.000000e+00  6.0260  0.000000e+00 0.5040000 8.266000
## 226  0.52693000  0.000000e+00  6.2000  0.000000e+00 0.5040000 8.725000
## 227  0.38214000  0.000000e+00  6.2000  0.000000e+00 0.5091133 8.040000
## 228  0.41238000  0.000000e+00  6.2000  0.000000e+00 0.5040000 7.163000
## 229  0.37451186  0.000000e+00  6.2000  0.000000e+00 0.5040000 7.686000
## 230  0.27986380  0.000000e+00  6.2000  0.000000e+00 0.5040000 6.552000
## 231  0.53700000  0.000000e+00  6.2000  0.000000e+00 0.5040000 5.981000
## 232  0.46296000  0.000000e+00  6.2000  0.000000e+00 0.5040000 7.412000
## 233  0.57529000  0.000000e+00  6.2000  0.000000e+00 0.5070000 8.337000
## 234  0.33147000  0.000000e+00  6.2000  0.000000e+00 0.5070000 8.247000
## 235  0.44791000  0.000000e+00  6.2000  1.000000e+00 0.5070000 6.726000
## 236  0.33045000  0.000000e+00  6.2000  0.000000e+00 0.5070000 6.580943
## 237  0.52058000  0.000000e+00  6.2000  1.000000e+00 0.5070000 6.631000
## 238  0.51183000  2.010000e+00  6.2000  0.000000e+00 0.5070000 7.358000
## 239  0.08244000  3.000000e+01  4.9300  0.000000e+00 0.4280000 6.481000
## 240  0.09252000  3.000000e+01  4.9300  0.000000e+00 0.4280000 6.606000
## 241  0.11329000  3.000000e+01  4.9300  0.000000e+00 0.4280000 6.897000
## 242  0.10612000  3.000000e+01  5.6396  0.000000e+00 0.4280000 6.095000
## 243  0.10290000  3.000000e+01  4.9300  0.000000e+00 0.4280000 6.358000
## 244  0.12757000  3.000000e+01  5.2898 -4.662937e-17 0.4280000 6.393000
## 245  0.20608000  2.200000e+01  5.8600  0.000000e+00 0.4310000 5.593000
## 246  0.19133000  2.200000e+01  5.8600  0.000000e+00 0.4310000 5.605000
## 247  0.16391469  2.200000e+01  5.8600  0.000000e+00 0.4310000 6.108000
## 248  0.19657000  2.200000e+01  5.8600  1.000000e-02 0.4310000 6.226000
## 249  0.16439000  2.200000e+01  5.8600  0.000000e+00 0.4310000 6.433000
## 250  0.19073000  2.200000e+01  5.8600  0.000000e+00 0.4310000 6.397492
## 251  0.14030000  2.200000e+01  5.8600  0.000000e+00 0.4310000 6.487000
## 252  0.21409000  2.200000e+01  5.8600  0.000000e+00 0.4310000 6.438000
## 253  0.08221000  2.200000e+01  5.8600  0.000000e+00 0.4310000 6.957000
## 254  0.36894000  2.200000e+01  5.8600  0.000000e+00 0.4310000 8.259000
## 255  0.04819000  8.000000e+01  3.6400  0.000000e+00 0.3920000 6.108000
## 256  0.03548000  8.000000e+01  3.6400  0.000000e+00 0.4044780 5.876000
## 257  0.01538000  9.000000e+01  3.7500  0.000000e+00 0.3940000 7.454000
```

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## 258  0.61154000  2.000000e+01  3.9700  0.000000e+00 0.6470000 8.704000
## 259  1.30099375  2.000000e+01  7.9269  0.000000e+00 0.6470000 7.333000
## 260  0.65665000  2.000000e+01  3.9700  0.000000e+00 0.6470000 7.171121
## 261  0.54011000  2.000000e+01  3.9700  0.000000e+00 0.6470000 7.203000
## 262  0.53412000  2.000000e+01  3.9700  0.000000e+00 0.6470000 7.520000
## 263  0.52014000  2.000000e+01  3.9700  0.000000e+00 0.6470000 8.398000
## 264  0.82526000  2.000000e+01  3.9700  0.000000e+00 0.6470000 7.327000
## 265  0.55007000  2.000000e+01  3.9700  0.000000e+00 0.6438200 7.216945
## 266  0.76162000  2.000000e+01  3.9700  1.033333e-01 0.6470000 5.560000
## 267  0.78570000  2.000000e+01  3.9700  0.000000e+00 0.6174200 7.014000
## 268  0.57834000  1.422500e+01  3.9700  1.000000e-02 0.5750000 7.135221
## 269  0.54050000  1.429000e+01  3.9700  0.000000e+00 0.5750000 7.470000
## 270  0.09065000  2.000000e+01  6.9600  1.000000e+00 0.4640000 5.920000
## 271  0.29916000  9.095000e+00  6.9600  0.000000e+00 0.4640000 5.856000
## 272  0.16211000  2.000000e+01  6.9600  0.000000e+00 0.4640000 6.240000
## 273  0.11460000  2.000000e+01  6.9600  1.233333e-01 0.4640000 6.538000
## 274  0.22188000  2.000000e+01  6.9600  1.000000e+00 0.4640000 7.691000
## 275  0.05644000  4.000000e+01  5.0763  1.000000e+00 0.4470000 6.758000
## 276  0.09604000  4.000000e+01  6.4100  0.000000e+00 0.4470000 6.854000
## 277  0.10469000  4.000000e+01  6.4100  1.000000e+00 0.4485840 6.902370
## 278  0.06127000  3.315000e+01  6.4100  1.000000e+00 0.4470000 6.826000
## 279  0.08101245  4.000000e+01  6.4100  0.000000e+00 0.4470000 6.482000
## 280  0.07717090  2.000000e+01  3.3300  0.000000e+00 0.4429000 6.812000
## 281  0.06164390  2.000000e+01  3.3300  0.000000e+00 0.4429000 7.820000
## 282  0.03705000  2.000000e+01  3.3300  0.000000e+00 0.4429000 6.968000
## 283  0.06129000  2.079500e+01  3.3300  1.000000e+00 0.4429000 7.645000
## 284  0.05111213  9.000000e+01  1.2100  2.000000e-01 0.4010000 7.923000
## 285  0.00906000  9.000000e+01  2.9700  0.000000e+00 0.4000000 7.088000
## 286  0.01096000  5.500000e+01  2.2500 -4.746203e-17 0.3890000 6.453000
## 287  0.01965000  8.000000e+01  1.7600  0.000000e+00 0.3850000 6.230000
## 288  0.03871000  5.250000e+01  5.3200  0.000000e+00 0.4050000 6.209000
## 289  0.04590000  5.250000e+01  5.3200  0.000000e+00 0.4050000 6.315000
## 290  0.04297000  5.213500e+01  5.3200  0.000000e+00 0.4050000 6.565000
## 291  0.03502000  8.000000e+01  4.9500  0.000000e+00 0.4110000 6.907297
## 292  0.07886000  8.000000e+01  4.9500  0.000000e+00 0.4110000 7.148000
## 293  0.03615000  8.000000e+01  4.9500  0.000000e+00 0.4110000 6.630000
## 294  0.08265000  0.000000e+00 13.9200  0.000000e+00 0.4370000 6.127000
## 295  0.11074620  0.000000e+00 11.5040  0.000000e+00 0.4370000 6.009000
## 296  0.12932000  0.000000e+00  8.1318  0.000000e+00 0.4370000 6.678000
## 297  0.05372000  0.000000e+00 13.9200  0.000000e+00 0.4370000 6.549000
## 298  0.14103000  0.000000e+00 13.9200  0.000000e+00 0.4370000 5.790000
## 299  0.06466000  7.000000e+01  2.2400  0.000000e+00 0.4000000 6.345000
## 300  0.05561000  7.000000e+01  2.2400  0.000000e+00 0.4000000 7.041000
## 301  0.04417000  7.000000e+01  2.2400  0.000000e+00 0.4096540 6.871000
## 302  0.03537000  3.400000e+01  6.0900  0.000000e+00 0.4330000 6.590000
## 303  0.09266000  3.400000e+01  6.0900  0.000000e+00 0.4330000 6.495000
## 304  0.10000000  3.400000e+01  6.0900  0.000000e+00 0.4330000 6.982000
## 305  0.05515000  3.300000e+01  4.5375  0.000000e+00 0.4720000 7.236000
## 306  0.05479000  3.300000e+01  2.1800  0.000000e+00 0.4720000 6.616000
## 307  0.07503000  3.300000e+01  2.1800  0.000000e+00 0.4720000 7.420000
## 308  0.04932000  3.300000e+01  3.8523  0.000000e+00 0.4843880 6.849000
## 309  0.37365848  0.000000e+00  9.9000  0.000000e+00 0.5440000 6.635000
## 310  0.34940000  0.000000e+00  9.8319  0.000000e+00 0.5440000 5.972000
## 311  2.63548000  0.000000e+00  9.9000  0.000000e+00 0.5440000 4.973000
```

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## 312  0.79041000  0.000000e+00  9.9000  0.000000e+00 0.5440000 6.122000
## 313  0.26169000  0.000000e+00  9.9000  0.000000e+00 0.5440000 5.938629
## 314  0.26938000  0.000000e+00  9.9000  0.000000e+00 0.5440000 6.266000
## 315  0.36920000  0.000000e+00  9.9000  0.000000e+00 0.5440000 6.567000
## 316  0.25356000 -1.012523e-14  9.9000  0.000000e+00 0.5440000 5.705000
## 317  0.31827000  0.000000e+00  9.9000  0.000000e+00 0.5440000 5.914000
## 318  0.24522000  0.000000e+00  9.9000  0.000000e+00 0.5440000 5.782000
## 319  0.40202000  0.000000e+00  9.9000  0.000000e+00 0.5440000 6.382000
## 320  0.47547000  0.000000e+00  9.7678  0.000000e+00 0.5440000 6.113000
## 321  0.16760000  0.000000e+00  7.3216  0.000000e+00 0.4930000 6.426000
## 322  0.21652453  0.000000e+00  7.3800  1.000000e-02 0.4930000 6.376000
## 323  0.35114000  5.250000e-01  7.3800  0.000000e+00 0.4930000 6.041000
## 324  0.28392000  0.000000e+00  7.3800  0.000000e+00 0.4930000 5.708000
## 325  0.34109000 -6.075140e-15  7.4894  0.000000e+00 0.4930000 6.415000
## 326  0.19186000  0.000000e+00  7.3800  0.000000e+00 0.4930000 6.431000
## 327  0.30347000  0.000000e+00  7.3800  0.000000e+00 0.4889200 6.455209
## 328  0.24103000  1.700000e+00  7.3800  0.000000e+00 0.4930000 6.083000
## 329  0.06617000  0.000000e+00  3.2400  0.000000e+00 0.4600000 6.180180
## 330  0.06724000  0.000000e+00  3.2400  0.000000e+00 0.4600000 6.490753
## 331  0.04544000  0.000000e+00  3.2400 -5.176415e-17 0.4600000 6.144000
## 332  0.05023000  3.500000e+01  6.0600  0.000000e+00 0.4379000 5.706000
## 333  0.03466000  3.500000e+01  6.0600  0.000000e+00 0.4379000 6.031000
## 334  0.09133805  0.000000e+00  5.1900  0.000000e+00 0.5150000 6.316000
## 335  0.03738000  0.000000e+00  5.1900  0.000000e+00 0.5150000 6.310000
## 336  0.03961000  0.000000e+00  5.1900  0.000000e+00 0.5150000 6.037000
## 337  0.03427000  0.000000e+00  5.1900  0.000000e+00 0.5150000 5.869000
## 338  0.03041000  0.000000e+00  5.1900  0.000000e+00 0.5150000 5.895000
## 339  0.03306000  0.000000e+00  5.1900  0.000000e+00 0.5150000 6.059000
## 340  0.05497000  0.000000e+00  5.1900  0.000000e+00 0.5150000 5.985000
## 341  0.06151000  0.000000e+00  5.1900  0.000000e+00 0.5150000 5.968000
## 342  0.01301000  3.500000e+01  1.5200  0.000000e+00 0.4420000 7.241000
## 343  0.02498000  0.000000e+00  1.8900  0.000000e+00 0.5180000 6.540000
## 344  0.02543000  5.500000e+01  3.7800  0.000000e+00 0.4840000 6.696000
## 345  0.03049000  5.500000e+01  3.7800  0.000000e+00 0.4840000 6.687005
## 346  0.06770912  0.000000e+00  4.3900  0.000000e+00 0.4420000 6.014000
## 347  0.06162000  0.000000e+00  4.3900  0.000000e+00 0.4420000 5.898000
## 348  0.01870000  8.500000e+01  3.0906  0.000000e+00 0.4290000 6.516000
## 349  0.01501000  8.000000e+01  2.0100  0.000000e+00 0.4350000 6.635000
## 350  0.02899000  4.000000e+01  1.2500  0.000000e+00 0.4290000 6.939000
## 351  0.06211000  4.000000e+01  1.2500  0.000000e+00 0.4290000 6.866137
## 352  0.07950000  6.000000e+01  1.6900  0.000000e+00 0.4110000 6.451690
## 353  0.07244000  6.000000e+01  1.6900  1.000000e-02 0.4254990 5.884000
## 354  0.01709000  9.000000e+01  2.0200  1.000000e-01 0.4100000 6.728000
## 355  0.04301000  8.000000e+01  1.9100  0.000000e+00 0.4130000 5.663000
## 356  0.10659000  8.000000e+01  4.5628  1.000000e-02 0.4130000 5.936000
## 357  8.98296000  0.000000e+00 18.1000  4.000000e-02 0.7700000 6.212000
## 358  3.84970000  0.000000e+00 18.1000  7.000000e-02 0.7700000 6.395000
## 359  5.20177000  0.000000e+00 18.1000  8.000000e-02 0.7700000 6.127000
## 360  4.26131000  0.000000e+00 18.1000  0.000000e+00 0.7700000 6.112000
## 361  4.54192000  0.000000e+00 18.1000  0.000000e+00 0.7700000 6.398000
## 362  6.00862702  0.000000e+00 18.1000  0.000000e+00 0.7700000 6.251000
## 363  3.67822000  0.000000e+00 18.1000  0.000000e+00 0.7700000 5.362000
## 364  4.22239000  0.000000e+00 18.1000  1.000000e+00 0.7700000 5.803000
## 365  3.47428000  0.000000e+00 18.1000  1.000000e+00 0.7180000 8.780000
```

```
## 366  4.55587000 -7.194245e-15 18.1000  0.000000e+00 0.7180000 3.561000
## 367 11.60691965  0.000000e+00 18.1000  0.000000e+00 0.7180000 4.963000
## 368 13.52220000  0.000000e+00 18.1000  0.000000e+00 0.6310000 3.863000
## 369  4.89822000  0.000000e+00 18.1000  0.000000e+00 0.6310000 4.970000
## 370  5.66998000  0.000000e+00 18.1000  1.000000e+00 0.6310000 6.683000
## 371  6.53876000  0.000000e+00 18.1000  1.000000e+00 0.6310000 7.016000
## 372 13.76724978  0.000000e+00 18.1000  0.000000e+00 0.6634997 6.216000
## 373  8.26725000  0.000000e+00 18.1000  1.000000e+00 0.6680000 5.875000
## 374 11.10810000 -7.940315e-15 18.1000  0.000000e+00 0.6680000 5.343984
## 375 18.49820000  0.000000e+00 18.1000  0.000000e+00 0.6680000 4.138000
## 376 19.60910000  0.000000e+00 18.1000  0.000000e+00 0.6710000 7.313000
## 377 15.28800000  0.000000e+00 18.1000  1.400000e-01 0.6710000 6.649000
## 378  9.82349000  0.000000e+00 18.1000  0.000000e+00 0.6710000 6.794000
## 379 23.64820000 -9.734435e-15 18.1000  0.000000e+00 0.6710000 6.380000
## 380 17.86670000  0.000000e+00 18.1000  0.000000e+00 0.6710000 6.223000
## 381 88.97620000  0.000000e+00 18.1000  0.000000e+00 0.6710000 6.968000
## 382 14.66492566  0.000000e+00 18.1000  0.000000e+00 0.6710000 6.545000
## 383  9.18702000  0.000000e+00 18.1000  0.000000e+00 0.7000000 5.657373
## 384  7.99248000  0.000000e+00 18.1000  0.000000e+00 0.7000000 5.520000
## 385 21.25287340  0.000000e+00 18.1000  0.000000e+00 0.7000000 4.368000
## 386 16.81180000  0.000000e+00 18.1000  0.000000e+00 0.7000000 5.277000
## 387 24.39380000  0.000000e+00 18.1000 -7.119305e-17 0.7000000 4.652000
## 388 22.59710000  0.000000e+00 18.1000  0.000000e+00 0.7000000 5.000000
## 389 14.33370000  0.000000e+00 18.1000 -7.285839e-17 0.7000000 4.880000
## 390  8.15174000  0.000000e+00 18.1000 -7.618906e-17 0.7000000 5.390000
## 391  6.96215000  0.000000e+00 18.1000  0.000000e+00 0.7000000 5.713000
## 392  5.29305000 -1.040945e-14 18.2134  0.000000e+00 0.6936684 6.051000
## 393 11.57790000  0.000000e+00 18.1000  0.000000e+00 0.7000000 5.036000
## 394  8.64476000  0.000000e+00 18.1000  0.000000e+00 0.6930000 6.193000
## 395 13.35980000  0.000000e+00 18.1000  0.000000e+00 0.7036142 5.887000
## 396  8.71675000  0.000000e+00 18.1000  0.000000e+00 0.7028577 6.471000
## 397  5.87205000  0.000000e+00 18.1000 -8.978929e-17 0.6930000 6.405000
## 398  7.67202000  0.000000e+00 18.1000  0.000000e+00 0.6941250 5.747000
## 399 38.35180000  0.000000e+00 18.1000  0.000000e+00 0.6930000 5.625375
## 400  9.91655000  0.000000e+00 18.1000  0.000000e+00 0.6930000 5.852000
## 401 25.04610000  0.000000e+00 18.1000  0.000000e+00 0.6930000 5.987000
## 402 14.23620000  0.000000e+00 18.1000  0.000000e+00 0.6803455 6.343000
## 403  9.59571000  0.000000e+00 18.1000  0.000000e+00 0.6930000 6.404000
## 404 24.80170000  0.000000e+00 18.1000  0.000000e+00 0.6962467 5.349000
## 405 41.52920000 -1.024958e-14 18.1000  0.000000e+00 0.6930000 5.531000
## 406 67.92080000  0.000000e+00 18.1000  0.000000e+00 0.6930000 5.683000
## 407 20.71620000  0.000000e+00 18.1000  0.000000e+00 0.6590000 4.138000
## 408 11.95110000  0.000000e+00 18.1000  0.000000e+00 0.6590000 5.608000
## 409  7.40389000  0.000000e+00 18.1000  0.000000e+00 0.5970000 5.721429
## 410 14.43830000  0.000000e+00 18.1000  0.000000e+00 0.6375029 6.852000
## 411 51.13580000  0.000000e+00 18.1000  0.000000e+00 0.5970000 5.757000
## 412 14.05070000  0.000000e+00 18.1000  0.000000e+00 0.5970000 6.657000
## 413 18.81100000  0.000000e+00 18.1000  0.000000e+00 0.5970000 5.219088
## 414 28.65580000  0.000000e+00 18.1000  0.000000e+00 0.5970000 5.155000
## 415 45.74610000  0.000000e+00 18.1000  0.000000e+00 0.6701130 4.519000
## 416 18.08460000  0.000000e+00 18.1000  0.000000e+00 0.6790000 6.434000
## 417 10.83420000  0.000000e+00 18.1000  0.000000e+00 0.6790000 6.782000
## 418 25.94060000 -1.008971e-14 18.1000  0.000000e+00 0.6797286 5.304000
## 419 73.53410000  0.000000e+00 18.1000  0.000000e+00 0.6790000 6.071423
```

```
## 420 11.81230000  0.000000e+00 18.0383  0.000000e+00 0.7180000 6.824000
## 421 11.08740000  0.000000e+00 18.1000 -8.146261e-17 0.7180000 6.411000
## 422  7.02259000 -1.039169e-14 18.1000  0.000000e+00 0.7180000 6.006000
## 423 12.04820000  0.000000e+00 18.1000  0.000000e+00 0.6845403 5.648000
## 424  7.05042000  0.000000e+00 18.1000  0.000000e+00 0.6140000 6.103000
## 425 12.43527028  0.000000e+00 18.1000  0.000000e+00 0.5840000 5.565000
## 426 15.86030000 -9.805490e-15 18.1000  0.000000e+00 0.6790000 5.896000
## 427 12.24720000  0.000000e+00 18.1000  0.000000e+00 0.5840000 5.837000
## 428 37.66190000  0.000000e+00 18.1000  0.000000e+00 0.6442443 6.202000
## 429  7.36711000  0.000000e+00 18.1000  0.000000e+00 0.6790000 6.193000
## 430  9.33889000  0.000000e+00 18.1000  0.000000e+00 0.6790000 6.380000
## 431  8.49213000  0.000000e+00 18.1000  0.000000e+00 0.5840000 6.348000
## 432 10.06230000 -9.645618e-15 18.1000  0.000000e+00 0.5840000 6.833000
## 433  6.44405000  0.000000e+00 18.1000  0.000000e+00 0.5840000 6.425000
## 434  5.58107000  0.000000e+00 18.1000  0.000000e+00 0.7130000 6.436000
## 435 13.91340000  0.000000e+00 18.1000  0.000000e+00 0.7130000 6.238743
## 436 11.16040000  0.000000e+00 18.1000  0.000000e+00 0.7400000 6.629000
## 437 14.42080000  0.000000e+00 18.1000  0.000000e+00 0.7400000 6.461000
## 438 15.17720000  0.000000e+00 18.1000  0.000000e+00 0.7400000 6.152000
## 439 13.67810000  0.000000e+00 18.1000  0.000000e+00 0.7400000 5.935000
## 440  9.39063000  0.000000e+00 18.1000  0.000000e+00 0.7400000 5.627000
## 441 22.05110000  0.000000e+00 18.1000  0.000000e+00 0.7028225 5.818000
## 442  9.72418000  0.000000e+00 18.1000  0.000000e+00 0.7400000 6.406000
## 443  5.66637000  0.000000e+00 18.1000  0.000000e+00 0.7400000 6.219000
## 444  9.96654000  0.000000e+00 18.1000  0.000000e+00 0.7400000 6.485000
## 445 12.80230000  0.000000e+00 18.1000  0.000000e+00 0.7400000 5.854000
## 446 10.67180000  0.000000e+00 18.1000  0.000000e+00 0.7400000 6.459000
## 447  6.28807000  0.000000e+00 18.1000 -8.798517e-17 0.7400000 6.341000
## 448  9.92485000  0.000000e+00 18.1000 -9.145462e-17 0.7400000 6.251000
## 449  9.32909000  0.000000e+00 18.1000  0.000000e+00 0.7130000 6.185000
## 450  7.52601000  0.000000e+00 18.1000  0.000000e+00 0.7130000 6.417000
## 451  6.71772000  0.000000e+00 18.1000  0.000000e+00 0.7130000 6.749000
## 452  5.44114000  0.000000e+00 18.1000  0.000000e+00 0.7130000 6.655000
## 453  5.09017000 -1.040945e-14 18.1000  0.000000e+00 0.7130000 6.297000
## 454  8.24809000  0.000000e+00 18.1000  0.000000e+00 0.6476083 7.393000
## 455  9.51363000  0.000000e+00 18.1000 -8.854029e-17 0.7130000 6.271720
## 456  4.75237000  0.000000e+00 18.1000  0.000000e+00 0.7130000 6.525000
## 457  4.66883000  0.000000e+00 18.1000  0.000000e+00 0.7130000 5.976000
## 458  8.20058000  0.000000e+00 18.1000  0.000000e+00 0.7130000 5.936000
## 459  7.75223000  0.000000e+00 18.1000  0.000000e+00 0.7130000 6.301000
## 460  6.80117000 -1.030287e-14 18.1000  0.000000e+00 0.7130000 6.081000
## 461  4.81213000  0.000000e+00 18.1000  3.000000e-02 0.6959282 6.701000
## 462  3.69311000  0.000000e+00 18.1000  0.000000e+00 0.7130000 6.376000
## 463  6.65492000  0.000000e+00 18.1000  0.000000e+00 0.6977679 6.109606
## 464  5.82115000  0.000000e+00 18.1000  0.000000e+00 0.7130000 6.513000
## 465  7.83932000  0.000000e+00 18.1000  0.000000e+00 0.6550000 6.209000
## 466  3.16360000  0.000000e+00 18.1823  3.000000e-02 0.6550000 5.759000
## 467  3.77498000  0.000000e+00 18.1000  0.000000e+00 0.6550000 5.952000
## 468  4.42228000  0.000000e+00 17.9498  0.000000e+00 0.5840000 6.148092
## 469 15.57570000  0.000000e+00 18.0159  0.000000e+00 0.5800000 5.926000
## 470 13.07510000  0.000000e+00 18.1000  0.000000e+00 0.5800000 5.713000
## 471  4.34879000  0.000000e+00 18.1000  0.000000e+00 0.5800000 6.167000
## 472  4.03841000 -1.017852e-14 18.1000  0.000000e+00 0.5320000 6.229000
## 473  3.56868000  0.000000e+00 18.1000  0.000000e+00 0.5800000 6.437000
```

```
## 474  4.64689000  0.000000e+00 18.1000  0.000000e+00 0.6140000 6.980000
## 475  8.05579000  0.000000e+00 18.1000 -8.201773e-17 0.5840000 5.427000
## 476  6.39312000  0.000000e+00 18.1000  0.000000e+00 0.5840000 6.162000
## 477  4.87141000  0.000000e+00 18.1000  0.000000e+00 0.7081965 6.484000
## 478 15.02340000  0.000000e+00 18.1000  0.000000e+00 0.6956610 5.304000
## 479 10.23300000  0.000000e+00 18.1000  0.000000e+00 0.6140000 6.185000
## 480 14.33370000  0.000000e+00 18.1000  0.000000e+00 0.6140000 6.229000
## 481  5.82401000  0.000000e+00 16.5438  0.000000e+00 0.5320000 6.242000
## 482  5.70818000  0.000000e+00 18.1000  0.000000e+00 0.5320000 6.750000
## 483  5.73116000  0.000000e+00 18.1000  0.000000e+00 0.5320000 6.553876
## 484  2.81838000  2.500000e-01 15.2155  0.000000e+00 0.5320000 5.762000
## 485  2.37857000  0.000000e+00 18.1000  0.000000e+00 0.5830000 5.871000
## 486  3.67367000  0.000000e+00 18.1000  0.000000e+00 0.5830000 6.010996
## 487  5.69175000  0.000000e+00 18.1000  0.000000e+00 0.5830000 6.114000
## 488  4.83567000  0.000000e+00 18.1000  0.000000e+00 0.5873710 5.905000
## 489  0.15086000  0.000000e+00 27.7400  0.000000e+00 0.6090000 5.454000
## 490  0.18337000  0.000000e+00 27.7400  0.000000e+00 0.6090000 5.414000
## 491  0.20746000  0.000000e+00 27.7400  0.000000e+00 0.6120400 5.916585
## 492  0.10574000  0.000000e+00 27.7400  0.000000e+00 0.6090000 5.983000
## 493  0.11132000  0.000000e+00 27.7400  0.000000e+00 0.6090000 5.983000
## 494  0.17331000  0.000000e+00  9.6900  0.000000e+00 0.5850000 5.707000
## 495  0.27957000  0.000000e+00  9.6900  0.000000e+00 0.5850000 5.926000
## 496  0.41911181  0.000000e+00  9.6900  1.000000e-02 0.5850000 5.725782
## 497  0.28960000  0.000000e+00  9.6900  0.000000e+00 0.5850000 5.390000
## 498  0.26838000  0.000000e+00 10.1488  0.000000e+00 0.5850000 5.843645
## 499  0.23912000  0.000000e+00  9.6900  0.000000e+00 0.5850000 6.019000
## 500  0.17783000  0.000000e+00  9.6900 -9.325873e-17 0.5850000 5.569000
## 501  0.22438000  0.000000e+00  9.6900  0.000000e+00 0.5850000 6.027000
## 502  0.06263000  0.000000e+00 11.9300  0.000000e+00 0.5730000 6.593000
## 503  0.04527000  0.000000e+00 11.9300  0.000000e+00 0.5730000 6.120000
## 504  0.06076000  0.000000e+00 11.9300  0.000000e+00 0.5717600 6.756892
## 505  0.10959000  1.000000e+00 11.9300  0.000000e+00 0.5730000 6.794000
## 506  0.04741000  0.000000e+00 11.9300  0.000000e+00 0.5730000 6.437997
##          age       dis   rad    tax ptratio    black     lstat
## 1    65.20000  4.844890  3.16 254.81  17.804 396.9000  4.980000
## 2    50.72350  4.658469  3.60 242.00  17.800 396.9000  9.140000
## 3    61.10000  4.967100  2.00 242.00  17.724 392.8300  7.117900
## 4    45.80000  6.062200  3.00 222.00  18.700 394.6300  2.940000
## 5    54.20000  6.062200  3.00 222.00  18.700 396.9000  5.330000
## 6    58.70000  6.062200  3.00 222.00  18.700 394.1200  5.210000
## 7    66.60000  5.560500  5.00 311.00  15.200 395.6000 12.430000
## 8    96.10000  5.950500  5.00 306.59  15.943 396.9000 19.150000
## 9   100.00000  6.082100  5.00 311.00  15.200 386.6300 29.930000
## 10   85.90000  6.592100  5.00 311.00  15.200 386.7100 17.100000
## 11   94.30000  6.346700  5.00 311.00  15.200 392.5200 20.450000
## 12   82.90000  6.226700  5.00 311.00  15.200 396.9000 13.270000
## 13   39.00000  5.450900  5.00 311.00  15.200 390.5000 15.710000
## 14   61.80000  4.707500  4.00 307.00  21.000 396.9000  8.260000
## 15   84.50000  4.461900  4.00 306.77  21.000 380.0200 10.260000
## 16   56.50000  4.498600  4.00 307.00  21.000 395.6200  8.470000
## 17   29.30000  4.498600  4.00 307.00  21.000 386.8500  6.580000
## 18   81.70000  4.257900  4.00 307.00  21.000 386.7500 11.941788
## 19   78.58328  3.796500  4.08 307.00  21.000 288.9900 11.690000
## 20   69.50000  3.796500  4.00 308.47  21.000 390.9500 11.280000
```

```
## 21   98.10000  3.797900  4.00 307.00  21.000 376.5700 21.020000
## 22   89.20000  4.012300  4.00 307.00  21.000 392.5300 13.830000
## 23   91.70000  3.976900  4.00 307.00  21.000 396.9000 18.720000
## 24   88.38555  4.095200  4.00 307.00  21.000 394.5400 19.880000
## 25   94.10000  4.399600  4.00 307.00  21.000 394.3300 16.300000
## 26   85.70000  4.454600  4.00 308.68  21.000 303.4200 16.510000
## 27   90.30000  4.682000  4.00 307.00  21.000 376.8800 14.810000
## 28   88.80000  4.453400  4.00 307.00  20.991 306.3800 17.280000
## 29   94.40000  4.454700  4.31 307.00  20.473 387.9400 12.800000
## 30   87.30000  4.239000  4.00 307.00  21.000 380.2300 11.980000
## 31   94.10000  4.233000  4.00 307.00  21.000 360.1700 22.600000
## 32   88.37200  4.095964  4.00 307.00  21.000 376.7300 13.040000
## 33   92.75687  3.990000  4.00 307.00  21.000 232.6000 27.710000
## 34   95.00000  3.787200  4.00 307.00  21.000 358.7700 18.350000
## 35   96.90000  3.759800  4.00 307.00  21.000 248.3100 20.340000
## 36   68.20000  3.360300  5.00 279.00  19.200 396.9000  9.680000
## 37   61.40000  3.377900  5.03 279.00  19.200 377.5600 11.410000
## 38   41.50000  3.934200  5.00 279.00  19.200 396.9000  8.770000
## 39   30.20000  3.847300  5.00 279.00  19.200 393.4300 10.130000
## 40   21.80000  5.401100  3.00 252.00  18.300 395.6300  4.320000
## 41   15.80000  5.401100  3.62 252.00  18.300 395.6200  1.980000
## 42    2.90000  5.720900  3.00 233.00  17.900 385.4100  4.840000
## 43    6.60000  5.720900  3.00 233.00  17.900 383.3700  5.810000
## 44   33.65217  5.720900  3.00 233.00  17.900 394.4600  7.440000
## 45   40.00000  5.720900  3.00 233.00  17.900 389.3900  9.550000
## 46   33.80000  5.100400  3.00 233.00  17.900 396.9000 10.210000
## 47   33.30000  5.100400  3.00 233.00  18.133 396.9000 14.150000
## 48   85.50000  5.689400  3.00 233.00  17.900 392.7400 18.800000
## 49   95.30000  5.870000  3.00 233.00  17.900 396.9000 17.764767
## 50   62.00000  6.087700  3.00 233.00  17.900 396.9000 16.200000
## 51   45.70000  6.058217  4.00 243.00  16.800 395.5600 13.450000
## 52   63.00000  5.591507  4.00 258.42  16.800 393.9700  9.430000
## 53   21.10000  6.814700  4.00 243.00  16.800 396.9000  5.280000
## 54   21.40000  6.814700  4.00 243.00  16.800 396.9000  8.430000
## 55   52.28442  7.319700  3.00 469.00  21.100 396.9000 14.800000
## 56   29.48667  8.696600  5.00 226.00  17.900 395.9300  4.810000
## 57   35.70000  9.187600  2.00 313.00  17.300 396.9000  5.770000
## 58   40.50000  8.324800  5.00 256.00  15.100 392.9000  3.950000
## 59   29.20000  7.814800  8.00 284.00  19.700 390.6800  6.860000
## 60   47.20000  6.932000  8.00 284.00  19.700 396.9000  9.220000
## 61   66.20000  7.225400  8.00 284.00  19.700 395.1100 13.150000
## 62   93.40000  6.818500  8.00 284.00  19.700 378.0800 14.440000
## 63   67.80000  7.225500  8.00 284.00  19.700 396.9000  6.730000
## 64   43.40000  7.980900  8.00 284.00  19.700 395.5800  9.500000
## 65   59.50000  6.054536  3.00 216.00  18.600 393.2400  8.050000
## 66   17.80000  6.611500  4.00 337.00  16.100 396.9000  4.670000
## 67   29.46850  6.611500  4.00 337.00  16.100 396.9000 10.240000
## 68   21.40000  6.498000  4.00 345.00  18.900 396.2100  8.100000
## 69   36.80000  6.498000  4.00 345.00  18.900 389.0917 13.090000
## 70   33.00000  6.629827  4.00 345.00  18.900 396.9000  8.790000
## 71    6.60000  5.287300  4.00 305.00  19.200 383.7300  6.720000
## 72   17.50000  5.287300  4.00 305.00  19.200 376.9400  9.880000
## 73    7.80000  5.287300  4.00 305.00  19.200 390.9100  5.520000
## 74   35.36150  5.287300  4.00 305.00  18.802 388.0910  8.996410
```

```
## 75    6.00000  4.251500  5.00 398.00  18.700 394.9200  6.780000
## 76   45.00000  4.502600  5.00 398.00  18.700 383.2300  8.940000
## 77   74.50000  4.052200  5.00 374.16  18.700 373.6600 11.970000
## 78   45.80000  4.090500  5.00 398.00  18.700 386.9600 10.447483
## 79   53.70000  5.014100  4.85 398.00  18.700 386.4000 10.490243
## 80   36.60000  4.502600  5.00 398.00  18.700 396.0600  9.100000
## 81   33.50000  5.400700  4.00 281.00  19.000 396.9000  5.290000
## 82   70.40000  5.400700  4.00 281.00  19.000 395.6300  7.220000
## 83   32.20000  5.400700  4.00 281.00  19.000 394.9722  6.720000
## 84   46.70000  5.400700  4.00 281.00  19.000 390.6400  7.510000
## 85   48.00000  4.779400  3.24 247.00  18.500 394.6138  7.440600
## 86   47.55050  4.437700  3.00 247.00  18.500 392.3000  6.530000
## 87   45.10000  4.427200  3.00 247.00  18.500 395.9900 12.860000
## 88   56.80000  3.747600  3.00 247.00  18.500 395.1500  8.440000
## 89   86.30000  3.421700  2.00 270.00  17.800 396.9000  5.500000
## 90   63.10000  3.414500  2.00 270.00  17.800 396.0600  5.700000
## 91   66.10000  3.092300  2.00 268.11  17.800 391.4509  8.810000
## 92   73.90000  3.092100  2.00 270.00  17.800 390.3643  8.200000
## 93   53.60000  3.665900  4.00 270.26  18.200 394.9210  8.160000
## 94   28.90000  3.665900  4.00 270.00  18.200 396.3300  8.099400
## 95   77.30000  3.615000  4.00 270.00  18.200 396.9000 10.590000
## 96   57.80000  3.495200  2.00 276.00  18.000 357.9800  8.719633
## 97   69.60000  3.495200  2.00 276.00  18.000 391.8300 11.340000
## 98   76.00000  3.495200  2.00 276.00  18.000 386.4759  7.865133
## 99   36.90000  3.495200  2.00 276.00  18.000 393.5300  3.570000
## 100  62.50000  3.495200  2.00 276.00  18.000 396.9000  6.190000
## 101  79.90000  2.777800  5.00 377.47  20.234 394.7600  9.420000
## 102  71.30000  2.856100  5.00 384.00  20.900 395.5800  7.670000
## 103  78.56225  2.790688  5.00 384.00  20.900  70.8000 10.630000
## 104  87.40000  2.714700  5.00 384.00  20.900 394.4700 13.440000
## 105  90.00000  2.421000  5.28 384.00  20.900 392.6900 12.330000
## 106  96.70000  2.810110  5.00 384.00  20.900 346.7897 16.470000
## 107  91.90000  2.211000  5.00 384.00  20.900 395.6700 15.616900
## 108  85.20000  2.122400  5.00 384.00  20.900 387.6900 14.090000
## 109  97.10000  2.432900  5.00 384.00  20.236 395.2400 12.270000
## 110  91.20000  2.545100  5.00 378.17  20.900 391.2300 15.550000
## 111  54.40000  2.777800  5.00 384.00  20.900 393.4900 13.000000
## 112  81.60000  2.677500  6.00 432.00  17.800 379.1093 10.160000
## 113  92.90000  2.353400  6.00 432.00  18.629 394.9500 16.210000
## 114  95.40000  2.548000  5.49 432.00  18.668 396.9000 17.090000
## 115  84.20000  2.256500  6.00 432.00  17.800 388.7400 10.450000
## 116  88.20000  2.463100  6.00 432.00  17.800 344.9100 15.760000
## 117  72.50000  2.730100  6.00 432.00  17.800 393.3000 12.040000
## 118  82.60000  2.747400  6.00 432.00  17.800 375.6070 10.300000
## 119  73.10000  2.477500  6.00 432.00  17.800 338.6300 15.370000
## 120  65.20000  2.759200  6.00 432.00  17.800 379.7566 13.610000
## 121  69.70000  2.257700  2.00 188.00  19.171 389.1500 14.370000
## 122  84.10000  2.232609  2.00 188.00  19.100 377.6700 14.270000
## 123  92.90000  2.086900  2.00 207.64  19.100 378.0900 17.930000
## 124  97.00000  1.928299  2.00 188.00  19.124 370.3100 25.410000
## 125  95.80000  2.006300  2.00 188.00  19.100 379.3800 17.580000
## 126  88.40000  1.992900  2.00 188.00  19.100 385.0200 14.810000
## 127  95.60000  1.757200  2.00 188.00  19.100 359.2900 27.260000
## 128  96.00000  1.788300  4.00 443.36  21.200 392.1100 18.976257
```

```
## 129  98.80000  1.812500  4.00 437.00  21.200 396.9000 15.390000
## 130  94.70000  1.979900  4.00 437.79  21.200 396.9000 18.228973
## 131  98.90000  2.118500  4.00 437.00  21.128 395.0400 12.600000
## 132  97.70000  2.271000  4.00 437.00  21.200 396.9000 12.260000
## 133  97.90000  2.117611  4.00 437.00  20.744 385.7600 11.120000
## 134  95.40000  2.469900  4.00 437.00  21.200 388.6900 15.030000
## 135  98.40000  2.346000  4.00 437.00  21.200 262.7600 17.310000
## 136  98.20000  2.110700  4.00 437.00  21.200 394.6700 16.960000
## 137  93.50000  2.173272  4.00 437.00  21.200 378.2500 16.900000
## 138  98.40000  1.849800  4.00 437.00  21.200 394.0800 14.590000
## 139  98.20000  1.668600  4.00 437.00  21.200 392.0400 21.320000
## 140  97.90000  1.668700  4.00 437.00  21.148 396.9000 18.460000
## 141  93.60000  1.611900  4.00 439.32  21.200 388.0800 24.160000
## 142 100.00000  1.439400  4.00 437.00  21.200 396.9000 34.410000
## 143 100.00000  1.321600  5.00 403.00  14.700 396.9000 26.820000
## 144 100.00000  1.446493  5.00 403.00  14.700 396.9000 26.420000
## 145  97.80000  1.345900  5.00 403.00  14.700 396.9000 29.290000
## 146 100.00000  1.419100  5.00 403.00  14.700 172.9100 27.800000
## 147 100.00000  1.516600  5.00 403.00  14.700 274.0288 16.650000
## 148  95.70000  1.535064  4.97 403.00  14.700 391.7100 29.530000
## 149  93.80000  1.529600  5.00 403.00  14.700 356.9900 28.320000
## 150  94.90000  1.525700  5.00 403.03  14.700 351.8500 21.450000
## 151  97.30000  1.618000  5.00 403.00  14.700 281.8794 14.100000
## 152 100.00000  1.587884  5.00 408.71  14.700 341.6000 13.280000
## 153  88.00000  1.610200  5.00 403.00  14.700 343.2800 12.120000
## 154  98.50000  1.623200  5.00 403.00  14.700 261.9500 16.488551
## 155  96.00000  1.749400  5.00 403.00  14.700 321.0200 15.120000
## 156  82.60000  1.745500  5.00 403.00  14.700  88.0100 15.020000
## 157  94.00000  1.736400  5.00 403.00  14.700  88.6300 16.140000
## 158  97.40000  1.877300  4.99 403.00  14.700 363.4300  9.262650
## 159 100.00000  1.757300  5.00 403.00  14.700 271.5666 16.688532
## 160 100.00000  1.765900  5.00 403.00  14.766 306.4905  7.390000
## 161  92.60000  1.798400  5.00 402.06  14.700 338.9200  5.500000
## 162  90.80000  1.970900  5.06 388.32  14.700 374.4300  1.730000
## 163  98.20000  2.040700  5.32 403.00  14.700 389.6100  1.920000
## 164  93.90000  2.162000  5.00 403.00  14.700 348.4286  3.320000
## 165  91.80000  2.422000  5.00 397.91  14.700 395.1100 11.640000
## 166  93.00000  2.204625  5.72 403.00  14.700 240.1600  9.810000
## 167  96.20000  2.045900  5.00 403.00  14.700 369.3000  3.700000
## 168  79.20000  2.425900  5.00 403.00  14.700 227.6100 12.140000
## 169  95.46382  2.100000  5.00 403.00  14.700 297.0900 11.100000
## 170  95.20000  2.262500  5.00 403.00  14.700 302.0614 11.320000
## 171  94.60000  2.425900  5.00 403.00  14.700 292.2900 14.430000
## 172  97.30000  2.388700  5.00 403.00  14.700 348.1300 12.030000
## 173  88.50000  2.596100  5.00 296.00  16.600 396.9000 14.690000
## 174  84.10000  2.646300  5.00 296.00  16.600 395.5000  9.040000
## 175  72.11300  2.701900  5.00 296.00  16.600 393.2300  9.640000
## 176  33.10000  4.444511  5.00 296.00  17.068 390.9600  5.330000
## 177  47.20000  3.554900  5.00 296.00  16.600 393.2300 10.110000
## 178  66.07100  3.317500  5.00 296.00  18.237 395.6000  6.290000
## 179  72.07540  2.915300  5.00 296.00  16.600 391.2700  6.920000
## 180  84.24380  2.829000  3.00 193.00  17.800 396.9000  5.040000
## 181  83.30000  2.741000  3.00 213.25  17.800 395.5600  7.560000
## 182  62.20000  2.597900  3.00 193.00  17.862 392.3284  9.450000
```

```
## 183  92.20000  2.700600  3.00 193.00  17.800 394.4621  6.897700
## 184  95.60000  2.847000  3.00 193.00  17.800 396.9000  5.680000
## 185  89.80000  2.987900  3.00 193.00  17.800 391.0000 13.443200
## 186  54.13750  4.237337  3.00 193.00  17.800 387.1100 13.150000
## 187  53.60000  4.195564  3.87 193.00  17.364 392.6300  4.450000
## 188  41.10000  3.788600  5.00 398.00  15.200 393.8700  6.680000
## 189  29.10000  4.566700  5.11 398.00  15.200 382.8400  4.560000
## 190  38.90000  4.566700  5.00 398.00  15.200 396.9000  5.390000
## 191  21.50000  5.627252  5.00 398.00  15.200 377.6800  5.100000
## 192  30.80000  6.479800  5.00 398.00  15.200 389.7100  4.690000
## 193  26.30000  6.479800  5.00 398.00  15.200 390.4900  2.870000
## 194   9.90000  6.219600  3.25 265.00  16.538 393.3700  5.030000
## 195  18.80000  6.219600  1.00 265.00  16.227 376.7000  4.380000
## 196  32.00000  5.648400  4.00 255.00  14.400 391.3401  2.970000
## 197  34.10000  7.514178  2.00 329.00  12.600 386.2221  4.080000
## 198  36.60000  7.309000  2.00 329.00  12.600 354.3100  8.610000
## 199  38.30000  7.309000  2.00 329.00  12.600 392.2000  6.620000
## 200  15.30000  7.653400  3.00 402.00  17.000 396.9000  4.560000
## 201  13.90000  7.653400  3.00 402.00  17.000 390.6574  4.450000
## 202  38.40000  8.089249  2.00 323.86  14.700 393.7700  7.430000
## 203  33.09550  7.202152  2.00 348.00  14.700 395.3800  3.110000
## 204  33.20000  5.118000  3.90 224.00  14.700 392.7800  3.810000
## 205  31.90000  5.118000  4.00 224.00  14.700 390.5500  3.653250
## 206  22.30000  4.425124  4.00 277.00  18.600 396.9000 10.870000
## 207  52.50000  3.944747  4.00 277.00  18.600 394.8700 10.970000
## 208  72.70000  4.354900  4.00 277.00  18.600 389.4300 18.060000
## 209  59.10000  4.239200  4.00 277.00  18.600 381.3200 14.660000
## 210 100.00000  3.875000  4.19 277.00  18.600 396.9000 20.964283
## 211  92.10000  3.877100  4.00 283.35  18.520 393.2500 17.270000
## 212  88.60000  3.665000  4.00 277.00  18.600 395.2400 23.980000
## 213  53.80000  3.652600  4.00 277.00  18.600 390.8560 16.030000
## 214  32.30000  3.945400  4.00 277.00  18.600 385.8100  8.955425
## 215   9.80000  3.587500  4.00 277.00  18.600 348.9300 29.550000
## 216  42.40000  3.945400  4.00 278.23  18.600 393.6300  9.470000
## 217  56.00000  3.112100  3.96 276.00  16.400 391.4214 13.510000
## 218  85.10000  3.421100  5.00 276.00  16.400 392.7800  9.690000
## 219  93.80000  2.889300  5.00 276.00  16.400 396.9000 17.920000
## 220  92.40000  3.363300  5.00 276.00  16.400 393.7400 10.500000
## 221  88.50000  2.861700  8.00 307.00  17.400 391.7000  9.710000
## 222  91.30000  3.048000  8.00 307.00  17.400 395.2400 21.460000
## 223  77.70000  3.272100  8.00 307.00  17.400 390.3900  9.930000
## 224  80.80000  3.272100  8.00 307.00  17.400 396.9000  7.600000
## 225  78.30000  2.894400  8.00 307.00  17.400 385.0500  5.060600
## 226  83.00000  2.894400  8.00 307.00  17.400 385.0166  4.630000
## 227  86.50000  3.215700  8.00 307.00  17.400 387.3800  3.130000
## 228  79.90000  3.322327  8.00 307.00  17.400 372.0800  6.360000
## 229  17.00000  3.375100  8.00 307.00  17.400 377.5100  3.920000
## 230  21.40000  3.375100  7.02 307.00  17.400 380.3400  3.760000
## 231  68.10000  3.671500  8.00 307.00  17.400 384.1491 11.650000
## 232  76.90000  3.671500  8.00 307.00  17.400 376.1400  5.250000
## 233  64.29700  3.838400  8.00 307.00  17.400 385.9100  2.470000
## 234  49.38350  3.651900  8.00 307.00  17.400 378.9500  3.950000
## 235  66.50000  3.651900  8.00 307.00  17.400 360.2000  8.050000
## 236  61.50000  3.651900  8.00 307.00  17.400 376.7500 10.880000
```

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## 237  76.50000  4.148000  8.00 307.00  17.400 388.4500  9.540000
## 238  71.60000  4.148000  8.00 302.98  17.400 390.0700  4.730000
## 239  18.50000  6.189900  5.55 300.00  16.600 379.4100  6.360000
## 240  42.20000  6.189900  6.00 300.00  16.600 385.7281  7.370000
## 241  54.30000  6.336100  6.00 300.00  16.600 391.2500 11.380000
## 242  65.10000  6.336100  6.00 300.00  16.600 394.6200 12.400000
## 243  52.90000  7.035500  6.00 300.00  17.258 372.7500 11.220000
## 244  31.13310  7.035500  6.00 300.00  16.600 374.7100  5.190000
## 245  76.50000  7.954900  7.00 330.00  19.100 372.4900 12.500000
## 246  70.20000  7.789732  7.00 330.00  19.100 389.1300 12.620050
## 247  34.90000  8.055500  7.00 330.00  19.100 390.1800  9.160000
## 248  79.20000  8.055500  7.00 330.00  19.100 376.1400 10.890417
## 249  49.10000  7.826500  7.00 330.00  18.981 374.7100  9.520000
## 250  17.50000  7.826500  7.00 330.00  19.100 393.7400  6.560000
## 251  13.00000  7.396700  7.00 330.00  19.100 384.7130  5.900000
## 252   8.90000  7.396700  7.00 330.00  19.100 377.0700  3.590000
## 253   6.80000  8.906700  7.00 330.00  19.100 388.7309  3.530000
## 254   8.40000  8.906700  7.00 318.76  19.100 396.9000  3.540000
## 255  32.00000  7.585161  1.00 315.00  16.400 392.8900  6.570000
## 256  19.10000  9.220300  1.00 315.00  16.400 395.1800  9.250000
## 257  34.20000  6.336100  3.48 244.00  15.900 386.3400  3.110000
## 258  87.67115  1.801000  5.00 264.00  13.000 384.2110  5.120000
## 259 100.00000  2.455424  5.00 264.00  13.000 383.2900  7.790000
## 260  84.99265  2.010700  5.00 265.27  13.000 391.9300  6.900000
## 261  81.80000  2.112100  5.16 264.00  13.000 392.8000  9.590000
## 262  89.40000  2.139800  5.00 264.00  13.000 388.3700  7.260000
## 263  91.50000  2.288500  5.00 264.00  13.000 386.8600  5.910000
## 264  94.50000  2.078800  5.00 264.00  13.000 393.4200 11.250000
## 265  91.60000  1.930100  5.00 264.00  13.000 387.8900  8.100000
## 266  62.80000  1.986500  5.00 264.00  13.000 392.4000 10.450000
## 267  84.60000  2.132900  5.00 264.00  13.000 384.0700 14.790000
## 268  67.00000  2.421600  5.00 290.13  13.000 384.5400  7.440000
## 269  52.60000  2.872000  5.00 304.53  13.000 390.3000  7.142680
## 270  52.23500  4.384735  3.54 223.00  18.600 388.6660 13.650000
## 271  55.47433  4.346776  3.00 223.00  18.600 388.6500 13.000000
## 272  16.30000  4.429000  3.00 223.00  18.600 396.9000  6.590000
## 273  58.70000  3.917500  3.00 239.04  18.600 394.9600  7.730000
## 274  51.80000  4.366500  3.00 223.00  17.472 390.2273  6.580000
## 275  32.90000  4.077600  4.33 254.00  17.600 396.9000  3.530000
## 276  42.80000  4.267300  4.00 254.00  17.600 392.6003  2.980000
## 277  49.00000  4.787200  4.00 254.00  17.600 389.2500  6.050000
## 278  27.60000  4.862800  4.00 254.00  17.600 393.4500  4.160000
## 279  32.10000  4.140300  4.00 254.00  17.600 396.9000  7.190000
## 280  32.20000  4.100700  5.00 292.88  14.900 396.9000  4.850000
## 281  64.50000  4.694700  5.00 216.00  15.788 387.3100  3.760000
## 282  37.20000  5.244700  5.00 216.00  14.900 392.2300  4.590000
## 283  49.70000  5.211900  5.00 216.00  14.900 390.9978  5.332700
## 284  24.80000  5.885000  1.00 198.00  13.600 395.5200  3.160000
## 285  20.80000  7.307300  1.00 285.00  15.300 394.7200  7.850000
## 286  27.22500  7.307300  1.00 300.00  15.300 394.7200  8.230000
## 287  31.50000  9.089200  1.00 241.00  18.200 341.6000 12.930000
## 288  31.30000  6.869238  4.05 293.00  16.600 396.9000  8.433900
## 289  45.60000  7.317200  4.27 293.00  16.600 396.9000  7.600000
## 290  22.90000  7.037509  6.00 293.00  16.600 371.7200  9.510000
```

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## 291  27.90000  5.116700  4.00 245.00  19.200 396.9000  3.330000
## 292  27.70000  5.116700  4.00 245.00  19.200 396.9000  3.560000
## 293  23.40000  5.116700  4.00 245.00  19.200 396.9000  4.700000
## 294  18.40000  5.502700  4.00 289.00  16.000 396.9000  8.580000
## 295  42.30000  5.502700  4.00 289.00  16.000 396.9000 10.400000
## 296  31.10000  5.960400  4.00 289.00  16.000 391.4525  6.270000
## 297  51.00000  5.960400  4.00 289.00  16.000 392.8500  7.390000
## 298  58.00000  6.320000  4.00 289.00  16.000 396.9000 15.840000
## 299  17.71600  7.827800  5.00 358.00  14.800 368.2400  4.970000
## 300  10.00000  7.827800  5.00 358.00  14.800 371.5800  4.740000
## 301  30.63283  7.827800  3.20 358.00  14.800 390.8600  6.070000
## 302  40.40000  5.491700  7.00 329.00  16.100 395.7500  9.500000
## 303  18.40000  5.491700  7.00 329.00  16.100 383.6100  8.670000
## 304  17.70000  5.491700  7.00 329.00  16.100 390.4300  4.860000
## 305  52.61050  4.022000  7.00 259.14  17.516 393.6800  6.949900
## 306  58.10000  3.370000  7.00 222.00  18.400 393.3600  8.930000
## 307  71.90000  3.099200  7.00 222.00  18.400 396.9000  6.470000
## 308  70.30000  3.182700  4.42 222.00  18.400 396.9000  7.530000
## 309  82.50000  3.317500  4.00 304.00  18.400 396.9000  4.540000
## 310  76.70000  3.102500  4.00 304.00  18.400 396.2400  9.970000
## 311  37.80000  2.519400  4.00 304.00  18.400 350.4500 12.640000
## 312  52.80000  2.640300  4.00 304.00  19.424 396.9000  5.980000
## 313  90.40000  2.834000  4.00 304.00  19.096 396.3000 11.720000
## 314  82.80000  3.262800  4.22 304.00  18.400 393.3900  7.900000
## 315  87.30000  3.602300  4.00 304.00  18.400 395.6900  9.280000
## 316  77.70000  3.945000  4.00 304.00  18.400 396.4200 11.500000
## 317  82.83388  3.998600  4.00 304.00  18.554 390.7000 18.330000
## 318  71.70000  4.031700  4.00 304.00  18.400 396.9000 15.940000
## 319  67.20000  3.532500  4.00 304.00  18.400 395.2100 10.360000
## 320  74.70600  4.001900  4.00 304.00  18.400 396.2300 12.730000
## 321  41.12833  4.540400  5.00 287.00  19.600 396.9000  7.200000
## 322  54.30000  4.540400  5.00 286.57  19.600 395.4475  6.870000
## 323  49.90000  4.721100  5.00 287.00  19.600 396.9000  7.700000
## 324  57.70087  4.391662  5.00 287.00  19.600 391.1300 11.740000
## 325  40.10000  4.721100  5.00 287.00  19.490 396.9000  7.201375
## 326  14.70000  5.415900  5.00 287.00  19.600 393.6800  5.080000
## 327  28.90000  5.415900  5.00 287.00  19.600 396.9000  6.150000
## 328  43.70000  5.415900  5.00 287.00  19.600 396.9000 12.790000
## 329  25.80000  5.214600  4.00 430.00  16.900 385.7338  9.970000
## 330  17.20000  5.214600  4.00 430.00  16.900 375.2100  7.340000
## 331  34.26133  5.873600  4.00 430.00  16.900 386.6680  9.090000
## 332  28.40000  6.640700  1.00 293.87  16.900 394.0200 12.430000
## 333  23.30000  6.640700  1.00 304.00  16.900 362.2500  7.830000
## 334  38.10000  6.458400  5.00 224.00  19.746 389.7100  5.680000
## 335  38.50000  6.458400  5.00 224.00  20.200 389.4000  6.750000
## 336  34.50000  5.985300  5.00 224.00  20.200 396.9000  8.010000
## 337  46.30000  5.231100  4.76 227.70  20.200 396.9000  9.800000
## 338  59.60000  5.615000  5.00 224.00  20.200 394.8100 10.560000
## 339  48.09133  4.812200  4.49 224.00  19.781 396.1400  8.510000
## 340  45.40000  5.014637  5.00 224.00  20.200 396.9000  9.740000
## 341  58.50000  4.812200  5.00 224.00  20.200 396.9000  9.290000
## 342  49.30000  7.037900  1.00 284.00  15.500 394.7400  5.490000
## 343  59.70000  4.778248  1.00 422.00  15.900 389.9600  8.650000
## 344  56.40000  5.732100  5.00 370.00  17.600 396.9000  7.180000
```

```
## 345  28.10000  6.465400  5.00 370.00  17.600 387.9700  4.610000
## 346  48.50000  8.013600  3.00 352.00  18.800 385.6400 10.530000
## 347  52.30000  8.013600  3.00 352.00  18.800 364.6100 12.670000
## 348  27.70000  8.535300  4.00 351.00  17.900 392.4300  6.360000
## 349  29.70000  8.344000  2.76 280.00  17.000 390.9400  5.990000
## 350  34.50000  8.792100  1.00 335.00  19.700 389.8500  5.890000
## 351  44.40000  8.792100  1.00 335.00  17.884 396.9000  5.980000
## 352  35.90000 10.710300  4.00 411.00  18.300 370.7800  6.752500
## 353  18.50000 10.710300  4.00 411.00  18.300 392.3300  7.790000
## 354  36.10000 12.126500  5.00 187.00  17.000 384.4600  4.500000
## 355  21.90000 10.585700  4.00 334.00  22.000 382.8000  9.955900
## 356  19.50000 10.585700  4.00 334.00  22.000 376.0400  9.114533
## 357  97.40000  2.122200 24.00 666.00  20.200 377.7300 17.600000
## 358  91.00000  2.505200 24.00 666.00  20.145 391.3400 13.270000
## 359  83.40000  2.722700 24.00 666.00  20.200 360.4453 11.480000
## 360  81.30000  2.509100 24.00 666.00  20.200 390.7400 12.670000
## 361  88.00000  2.518200 24.00 666.00  20.200 374.5600  7.790000
## 362  91.10000  2.295500 24.00 666.00  20.200 320.0007 14.190000
## 363  96.20000  2.103600 24.00 666.00  20.200 380.7900 10.190000
## 364  88.88521  1.904700 24.00 660.74  20.200 353.0400 12.374102
## 365  82.90000  1.904700 24.00 666.00  20.200 354.5500  5.290000
## 366  87.90000  1.613200 24.00 666.00  20.200 354.7000  7.120000
## 367  91.40000  1.752300 24.00 666.00  20.200 316.0300 14.000000
## 368  93.56438  1.510600 24.00 666.00  20.200 131.4200 13.330000
## 369 100.00000  1.332500 24.00 666.00  20.200 375.5200  3.260000
## 370  96.80000  1.356700 24.00 666.00  20.200 375.3300  3.730000
## 371  97.50000  1.202400 24.00 666.00  20.200 392.0500  2.960000
## 372 100.00000  1.169100 24.00 666.00  20.200 366.1500  9.530000
## 373  89.60000  1.129600 24.00 666.00  20.200 347.8800  8.880000
## 374 100.00000  1.174200 24.00 666.00  20.210 396.9000 34.770000
## 375 100.00000  1.137000 24.00 666.00  20.200 396.9000 37.970000
## 376  97.90000  1.316300 24.00 666.00  20.200 396.9000 13.440000
## 377  93.30000  1.344900 24.00 666.00  20.200 363.0200 23.240000
## 378  98.80000  1.358000 24.00 666.00  20.200 396.9000 21.240000
## 379  96.20000  1.386100 24.00 666.00  20.200 317.3423 23.690000
## 380 100.00000  1.386100 24.00 666.00  20.200 393.7400 21.780000
## 381  91.90000  1.416500 24.00 666.00  20.200 396.9000 17.210000
## 382  99.10000  1.496161 24.00 666.00  20.200 396.9000 21.080000
## 383 100.00000  1.572057 24.00 666.00  20.200 384.7494 23.600000
## 384 100.00000  1.533100 24.00 666.00  20.200 380.6109 24.560000
## 385  91.20000  1.599948 24.00 666.00  20.200 285.8300 30.630000
## 386  98.10000  1.426100 24.00 666.00  20.200 396.9000 30.810000
## 387 100.00000  1.467200 24.00 666.00  20.200 324.9083 28.280000
## 388  89.50000  1.518400 24.00 666.00  20.200 396.9000 31.990000
## 389 100.00000  1.589500 24.00 666.00  20.200 372.9200 30.620000
## 390  98.90000  1.728100 24.00 666.00  20.200 396.9000 20.850000
## 391  97.00000  1.926500 24.00 666.00  20.200 394.4300 17.110000
## 392  82.50000  2.167800 24.00 666.00  20.200 378.3800 18.760000
## 393  97.00000  1.770000 24.00 666.00  20.200 344.3108 20.630613
## 394  92.60000  1.791200 24.00 666.00  20.200 396.9000 15.170000
## 395  94.70000  1.782100 24.00 666.00  20.200 396.9000 20.615658
## 396  98.80000  1.725700 24.00 666.00  20.200 391.9800 17.120000
## 397  96.00000  1.676800 24.00 666.00  20.200 396.9000 19.370000
## 398  98.90000  1.633400 24.00 666.00  20.200 393.1000 19.920000
```

```
## 399 100.00000  1.489600 24.00 666.00  20.200 396.9000 26.445376
## 400  77.80000  1.500400 24.00 666.00  20.200 338.1600 29.970000
## 401 100.00000  1.588800 24.00 666.00  20.200 396.9000 26.770000
## 402 100.00000  1.574100 24.00 666.00  20.200 396.9000 20.320000
## 403 100.00000  1.709794 24.00 666.00  20.200 376.1100 20.310000
## 404  96.00000  1.702800 24.00 666.00  20.200 396.9000 25.131634
## 405  94.30839  1.607400 24.00 666.00  20.200 329.4600 27.380000
## 406 100.00000  1.425400 24.00 666.00  20.200 384.9700 22.980000
## 407 100.00000  1.413641 24.00 666.00  20.200 370.2200 23.340000
## 408 100.00000  1.285200 24.00 666.00  20.200 332.0900 12.130000
## 409  97.90000  1.454700 24.00 666.00  20.200 259.1763 26.400000
## 410 100.00000  1.465500 24.00 666.00  20.200 179.3600 19.780000
## 411 100.00000  1.413000 24.00 666.00  20.200   2.6000 10.110000
## 412 100.00000  1.527500 24.00 666.00  20.200  35.0500 20.854573
## 413 100.00000  1.553900 24.00 666.00  20.200  28.7900 34.370000
## 414 100.00000  1.589400 24.00 666.00  20.200 150.8707 20.080000
## 415 100.00000  1.658200 24.00 666.00  20.200  88.2700 36.980000
## 416 100.00000  1.834700 24.00 666.00  20.200  27.2500 29.050000
## 417  90.80000  1.819500 24.00 666.00  20.200  21.5700 22.298694
## 418  89.10000  1.647500 24.00 666.00  20.200 127.3600 26.640000
## 419 100.00000  1.802600 24.00 666.00  20.200  16.4500 20.620000
## 420  76.50000  1.794000 24.00 666.00  20.200  48.4500 22.740000
## 421 100.00000  1.858900 24.00 666.00  20.200 318.7500 15.020000
## 422  95.30000  1.874600 24.00 666.00  20.200 319.9800 15.700000
## 423  87.60000  1.790696 24.00 666.00  20.200 291.5500 14.100000
## 424  85.10000  2.021800 24.00 666.00  20.200   2.5200 23.290000
## 425  85.86075  2.063500 24.00 666.00  20.200 126.2276 17.160000
## 426  95.40000  1.909600 24.00 666.00  20.200   7.6800 24.390000
## 427  59.70000  1.997600 24.00 666.00  20.200  24.6500 15.690000
## 428  78.70000  2.155255 24.00 666.00  20.200  18.8200 14.520000
## 429  78.10000  1.935600 24.00 666.00  20.200  96.7300 21.520000
## 430  91.29123  1.968200 24.00 666.00  20.200  60.7200 24.080000
## 431  86.10000  2.052700 24.00 666.00  20.200  83.4500 17.640000
## 432  94.30000  2.088200 24.00 666.00  20.200  81.3300 19.690000
## 433  74.80000  2.200400 24.00 666.00  20.200  97.9500 12.030000
## 434  87.90000  2.315800 24.00 666.00  20.200 100.1900 17.301677
## 435  95.00000  2.222200 24.00 666.00  20.200 100.6300 15.170000
## 436  94.60000  2.124700 24.00 666.00  20.200 161.5460 23.270000
## 437  93.30000  2.002600 24.00 666.00  20.200  27.4900 18.050000
## 438 100.00000  1.914200 24.00 666.00  20.200   9.3200 26.450000
## 439  87.90000  1.820600 24.00 666.00  20.200  68.9500 34.020000
## 440  93.90000  1.817200 24.00 666.00  20.200 396.9000 22.880000
## 441  95.83013  1.866200 24.00 666.00  20.200 391.4500 23.417374
## 442  97.20000  2.065100 24.00 666.00  20.200 385.9600 19.520000
## 443 100.00000  2.004800 24.00 666.00  20.200 328.3334 16.590000
## 444 100.00000  1.978400 24.00 666.00  20.200 386.7300 18.850000
## 445  96.60000  1.895600 24.00 666.00  20.200 246.4023 23.790000
## 446  92.88865  1.987900 24.00 666.00  20.200  43.0600 23.980000
## 447  96.40000  2.137936 24.00 666.00  20.200 318.0100 17.790000
## 448  96.60000  2.198000 24.00 666.00  20.200 388.5200 16.440000
## 449  98.70000  2.261600 24.00 666.00  20.200 396.9000 18.130000
## 450  94.09513  2.185000 24.00 666.00  20.200 304.2100 18.422442
## 451  92.60000  2.323600 24.00 666.00  20.200   0.3200 17.440000
## 452  98.20000  2.355200 24.00 666.00  20.200 355.2900 17.730000
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## 453  91.80000  2.368200 24.00 666.00  20.200 211.2216 17.270000
## 454  99.30000  2.452700 23.03 666.00  19.791 375.8700 16.740000
## 455  94.10000  2.496100 24.00 666.00  20.200   6.6800 18.710000
## 456  86.50000  2.435800 24.00 666.00  20.200  50.9200 18.130000
## 457  87.90000  2.580600 24.00 666.00  20.200 218.7279 19.010000
## 458  80.30000  2.779200 24.00 666.00  20.200   3.5000 18.699530
## 459  83.70000  2.783100 24.00 666.00  20.200 272.2100 15.794425
## 460  84.40000  2.717500 24.00 666.00  20.200 396.9000 14.700000
## 461  90.00000  2.597500 24.00 666.00  20.200 255.2300 16.420000
## 462  88.40000  2.567100 24.00 666.00  20.200 391.4300 14.650000
## 463  83.00000  2.734400 24.00 666.00  20.200 396.9000 13.990000
## 464  89.90000  2.801600 24.00 666.00  20.200 393.8200 14.532558
## 465  65.40000  2.963400 24.00 666.00  20.200 396.9000 13.220000
## 466  48.20000  3.066500 22.10 666.00  20.200 334.4000 14.130000
## 467  84.70000  2.871500 24.00 666.00  20.200  22.0100 17.150000
## 468  94.50000  2.540300 23.58 666.00  20.200 331.2900 21.320000
## 469  71.00000  2.908400 24.00 666.00  20.200 368.7400 18.130000
## 470  56.70000  2.823700 24.00 666.00  20.200 396.9000 14.760000
## 471  72.24439  3.033400 24.00 666.00  20.200 396.9000 13.349400
## 472  90.70000  3.099300 23.19 666.00  20.200 395.3300 12.870000
## 473  75.00000  2.896500 24.00 666.00  20.200 393.3700 11.140950
## 474  67.60000  2.532900 24.00 666.00  20.145 374.6800 11.660000
## 475  95.40000  2.429800 24.00 666.00  20.200 237.5200 18.140000
## 476  97.40000  2.206000 24.00 666.00  20.200 302.7600 24.100000
## 477  93.60000  2.305300 24.00 666.00  20.200 210.3173 18.680000
## 478  97.30000  1.616600 24.00 666.00  20.200 350.9481 24.910000
## 479  96.70000  2.170500 24.00 666.00  20.200 379.7000 18.030000
## 480  88.00000  1.951200 24.00 666.00  20.200 383.3200 13.110000
## 481  64.70000  3.288634 24.00 666.00  20.200 396.9000 10.740000
## 482  74.90000  3.163291 24.00 666.00  20.222 393.0700  7.740000
## 483  70.65236  3.410600 23.39 666.00  20.209 395.2800  7.010000
## 484  40.30000  4.098300 24.00 528.79  20.196 392.9200 10.420000
## 485  41.90000  3.724000 24.00 666.00  20.200 359.0536 13.340000
## 486  51.90000  3.991700 24.00 656.80  20.200 388.6200 10.580000
## 487  79.80000  3.545900 24.00 666.00  20.200 392.6800 14.980000
## 488  53.20000  3.152300 24.00 666.00  20.200 388.2200 11.450000
## 489  92.70000  1.820900  4.00 711.00  20.100 395.0900 18.060000
## 490  98.30000  1.755400  4.00 711.00  20.100 344.0500 23.970000
## 491  98.00000  1.822600  4.00 637.44  20.100 318.4300 19.937602
## 492  98.80000  1.945099  4.00 711.00  20.100 390.1100 18.070000
## 493  83.50000  2.109900  4.00 711.00  20.100 396.9000 13.350000
## 494  72.77370  2.729771  6.00 391.00  19.200 396.9000 12.010000
## 495  73.08497  2.381700  6.00 391.00  19.200 396.9000 13.590000
## 496  28.80000  2.798600  6.00 391.00  19.200 393.2900 17.600000
## 497  72.90000  2.798600  6.00 391.00  19.200 396.9000 21.140000
## 498  70.60000  2.892700  6.00 391.00  19.200 396.9000 14.100000
## 499  65.30000  2.409100  6.00 391.00  19.200 396.9000 12.920000
## 500  73.50000  2.598098  6.00 391.00  19.200 395.7700 15.100000
## 501  79.70000  2.498200  6.00 391.00  19.200 396.9000 14.330000
## 502  69.10000  2.517636  1.00 273.00  21.000 391.9900  9.670000
## 503  76.70000  2.287500  1.00 273.00  21.000 396.9000  9.080000
## 504  91.00000  2.167500  1.00 273.00  21.000 389.6417  5.640000
## 505  89.30000  2.388900  1.00 273.00  21.000 393.4500  6.480000
## 506  76.65950  2.505000  1.00 273.00  21.000 382.9654  7.880000
```