Lab 9

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4/29/2021

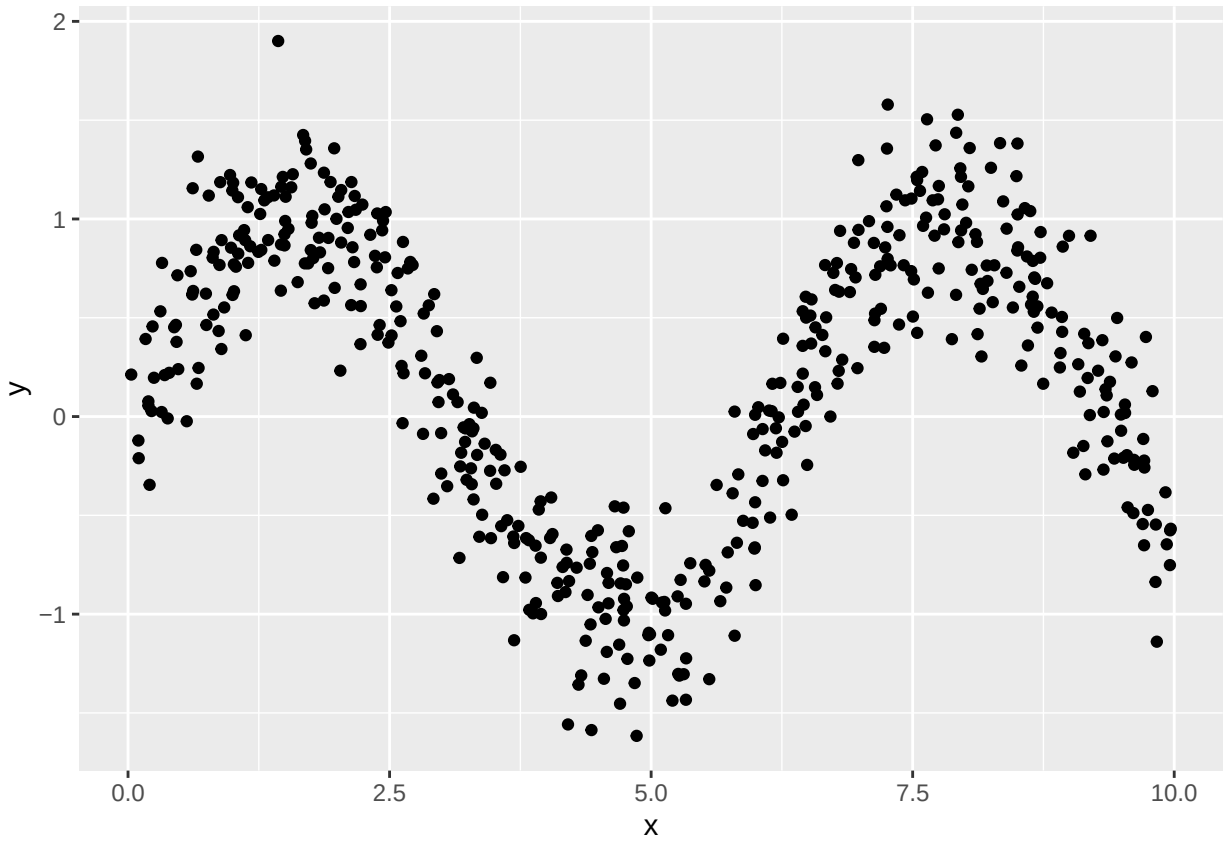
Here we will learn about trees, bagged trees and random forests. You can use the `YARF` package if it works, otherwise, use the `randomForest` package (the standard).

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))
```

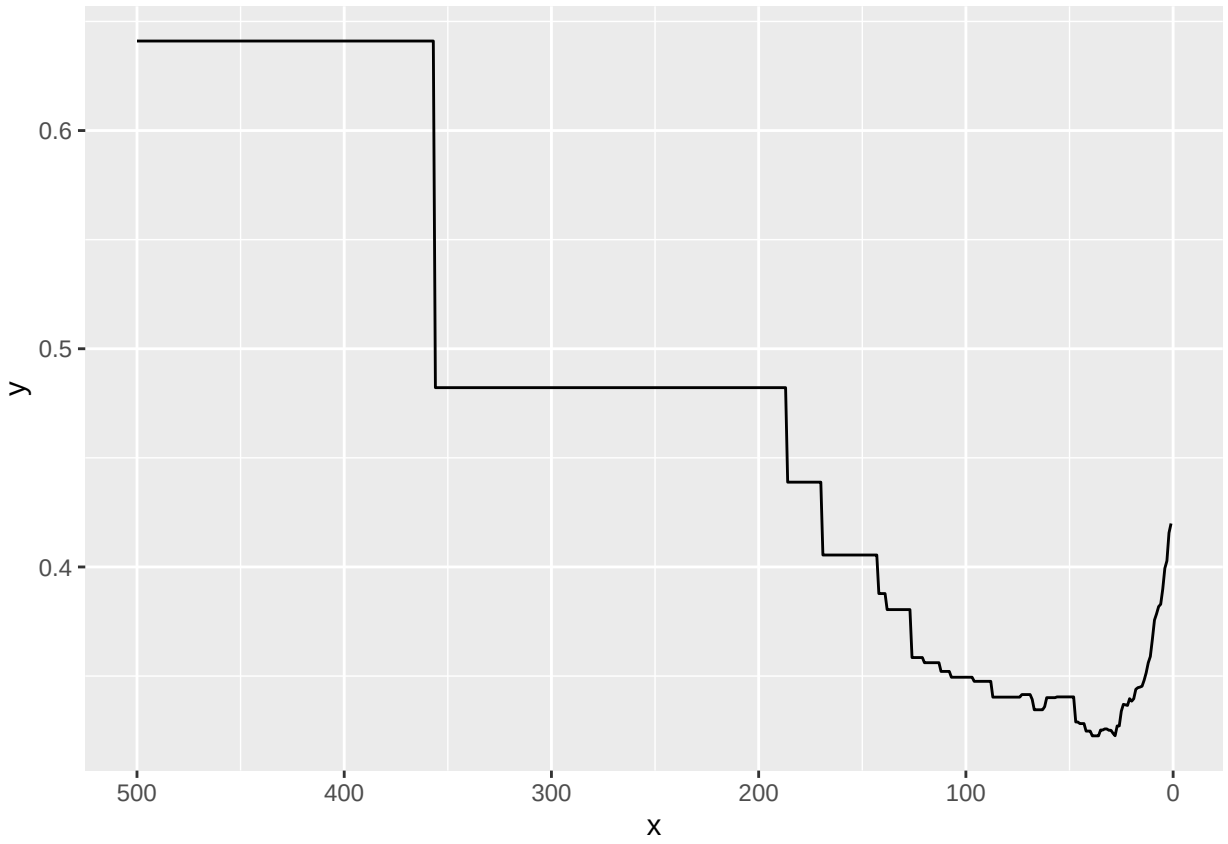


Create a test set of size 500 as well

```
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()
```

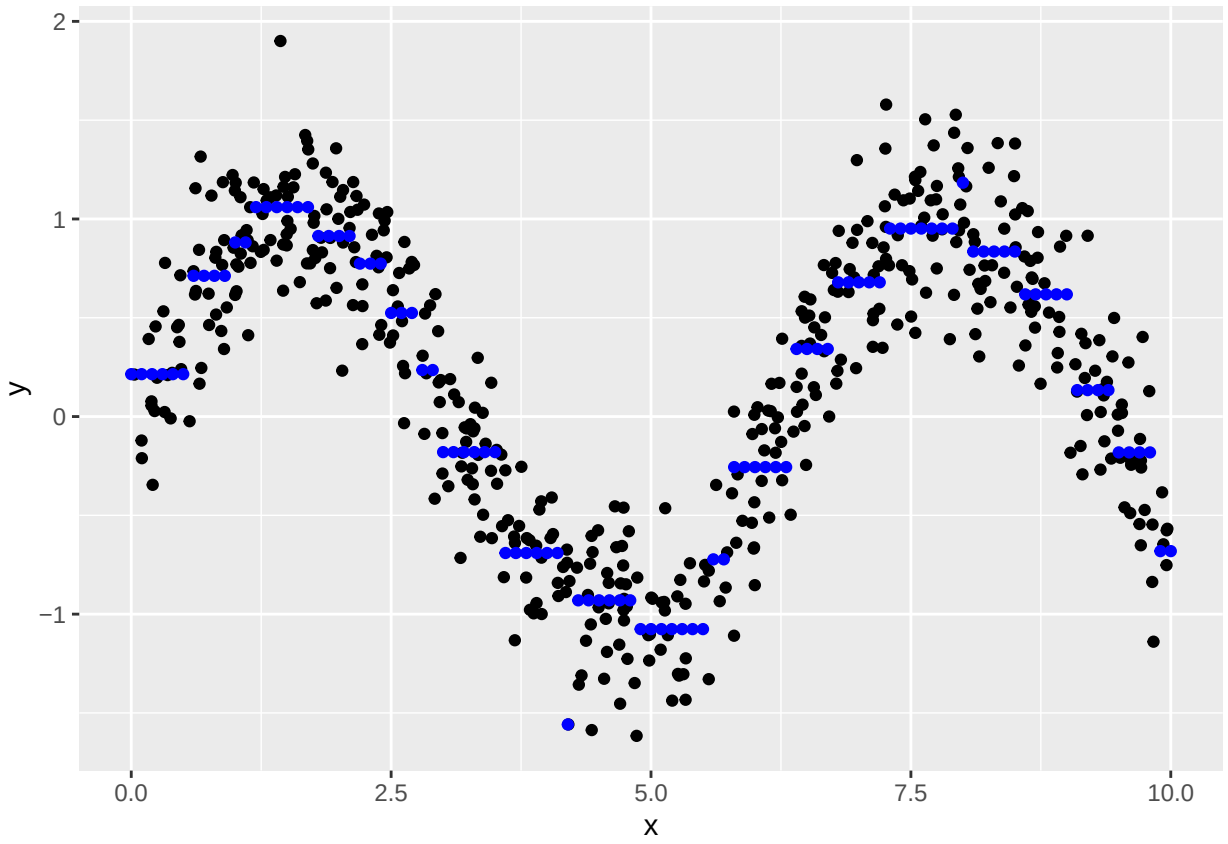



```
which.min(se_by_node_sizes)
```

```
## [1] 39
```

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 = n
resolution = 0.1
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 = "blue")
```



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.

```
n_train = 20
n_test = 1000
Nsim = 1000

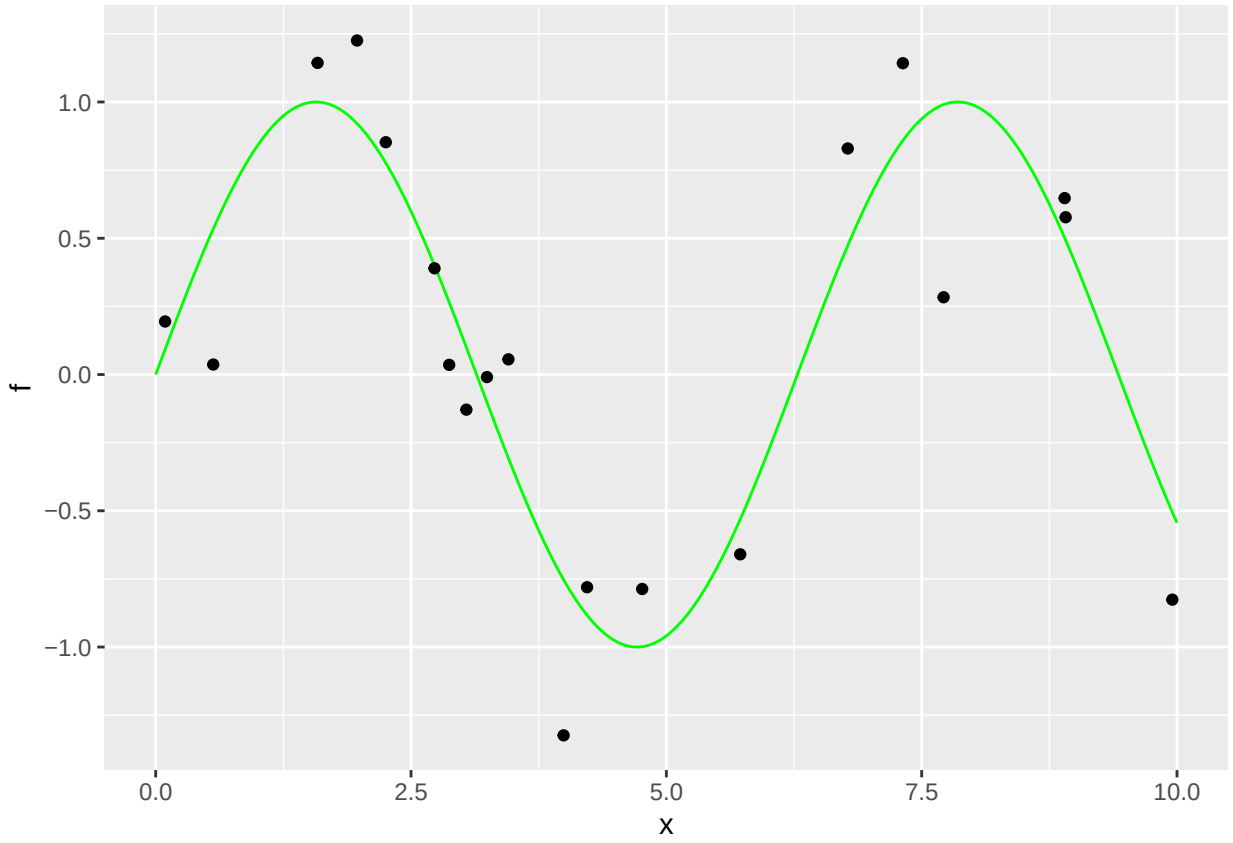
training_gs = matrix(NA, nrow = Nsim, ncol = 2)
x_trains = matrix(NA, nrow = Nsim, ncol = n_train)
y_trains = matrix(NA, nrow = Nsim, ncol = n_train)
all_oos_residuals = matrix(NA, nrow = Nsim, ncol = n_test)
for (nsim in 1 : Nsim){
  #simulate dataset $\mathbb{D}$
  x_train = runif(n_train, x_min, x_max)
  delta_train = rnorm(n_train, 0, sigma) #Assumption I: mean zero and Assumption II: homoskedastic
  y_train = f_x(x_train) + delta_train
  x_trains[nsim, ] = x_train
  y_trains[nsim, ] = y_train

  #fit a model g | x's, delta's and save it
  g_model = lm(y_train ~ ., data.frame(x = x_train))
  training_gs[nsim, ] = coef(g_model)

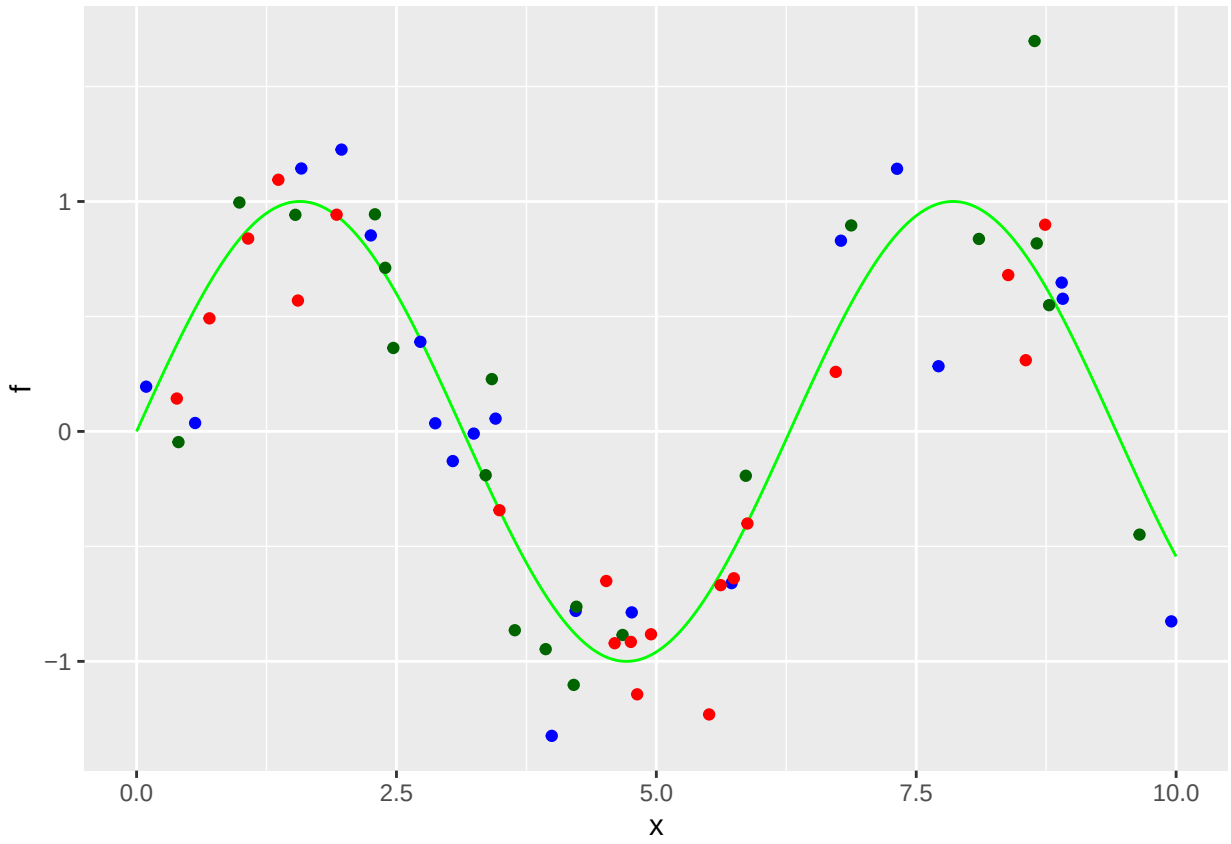
  #generate oos dataset according to the same data generating process (DGP)
  x_test = runif(n_test, x_min, x_max)
  delta_test = rnorm(n_test, 0, sigma)
  y_test = f_x(x_test) + delta_test
  #predict oos using the model and save the oos residuals
```

```
  y_hat_test = predict(g_model, data.frame(x = x_test))
  all_oos_residuals[nsim, ] = y_test - y_hat_test
}

pacman::p_load(ggplot2)
resolution = 10000
x = seq(x_min, x_max, length.out = resolution)
f_x_df = data.frame(x = x, f = f_x(x))
ggplot(f_x_df, aes(x, f)) +
  geom_line(col = "green") +
  geom_point(aes(x, y), data = data.frame(x = x_trains[1, ], y = y_trains[1, ]))
```



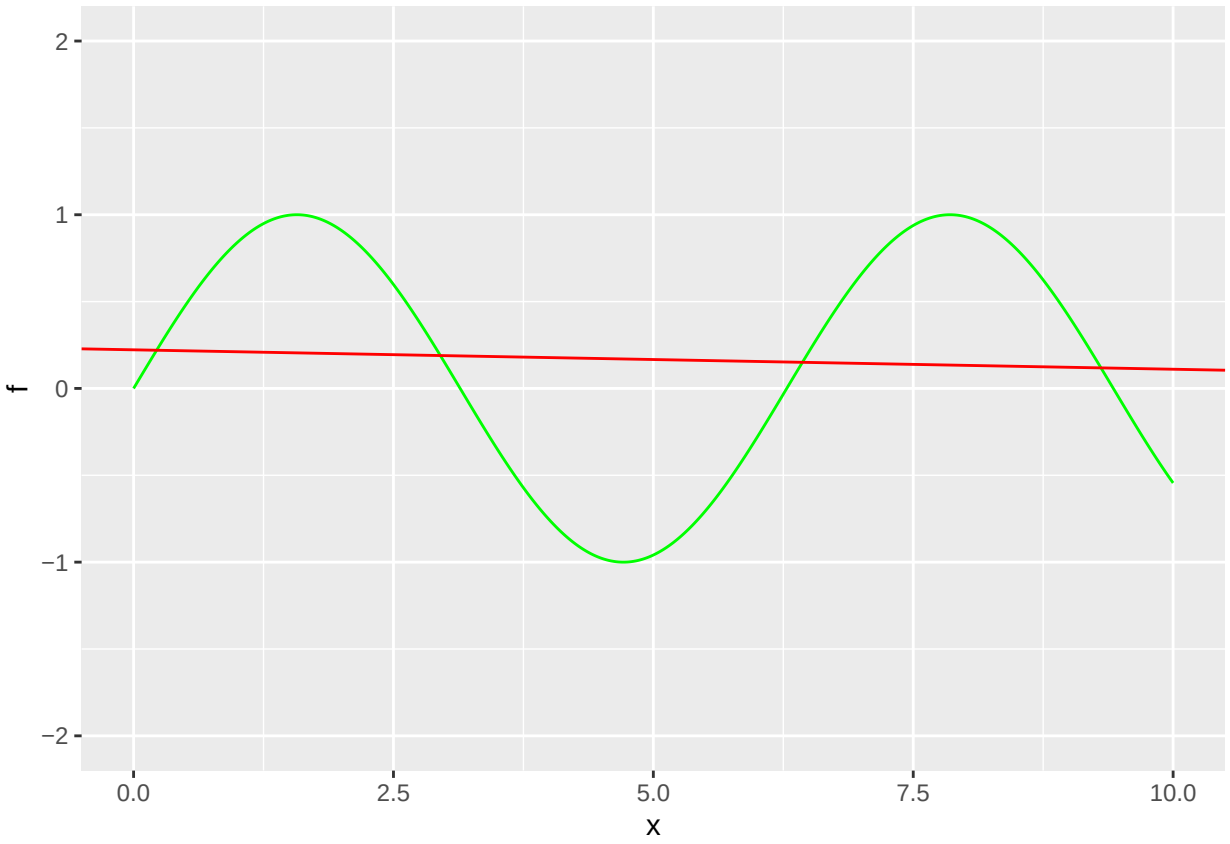

```
ggplot(f_x_df, aes(x, f)) +
  geom_line(col = "green") +
  geom_point(aes(x, y), data = data.frame(x = x_trains[1, ], y = y_trains[1, ]), col = "blue") +
  geom_point(aes(x, y), data = data.frame(x = x_trains[2, ], y = y_trains[2, ]), col = "darkgreen") +
  geom_point(aes(x, y), data = data.frame(x = x_trains[3, ], y = y_trains[3, ]), col = "red")
```




```
mse = mean(c(all_oos_residuals)^2)
mse
```

```
## [1] 0.5839188
```

```
g_average = colMeans(training_gs)
ggplot(f_x_df, aes(x, f)) +
  geom_line(col = "green") +
  geom_abline(intercept = g_average[1], slope = g_average[2], col = "red") +
  ylim(-2, 2)
```

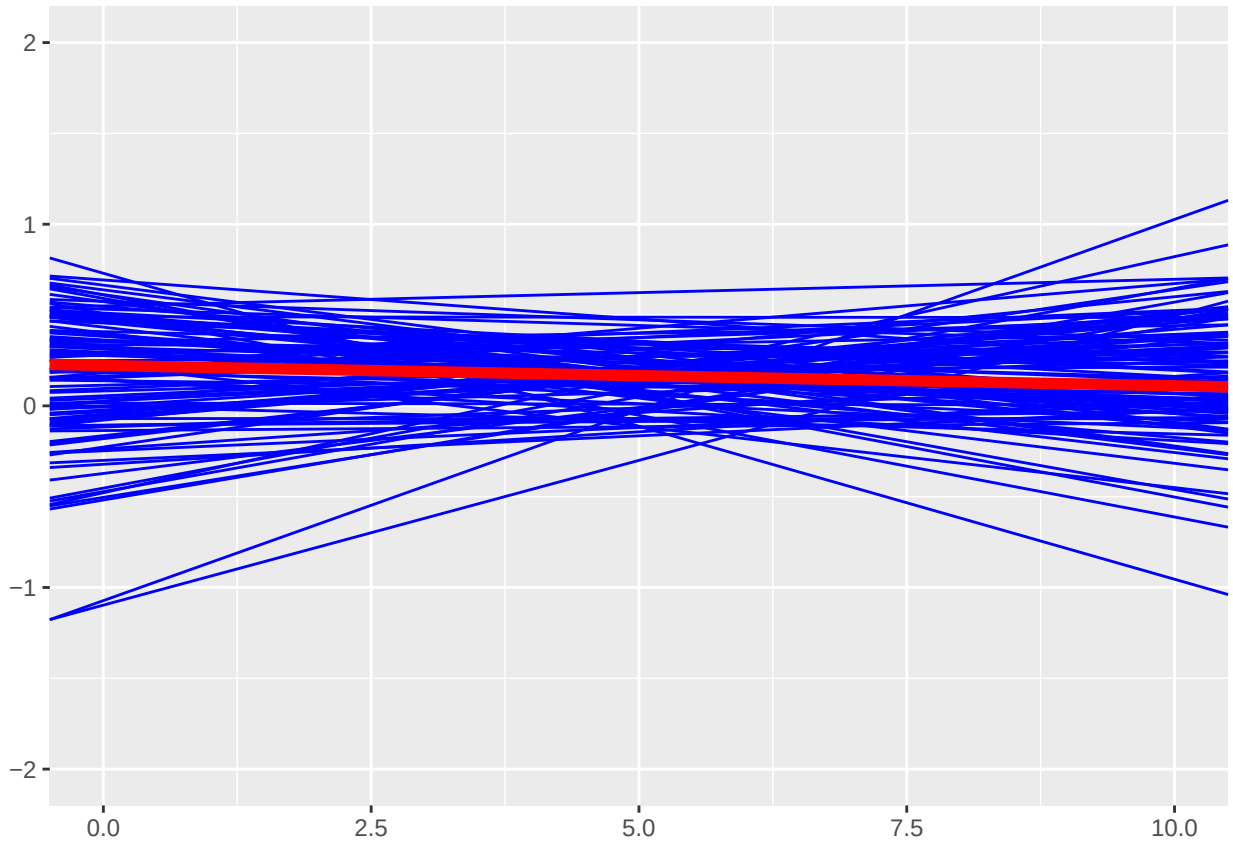



```
x = seq(x_min, x_max, length.out = resolution)
g_avg_x = g_average[1] + g_average[2] * x
f = sin(x)
biases = f - g_avg_x
expe_bias_g_sq = mean(biases^2)
expe_bias_g_sq
```

```
## [1] 0.4416661
```

```
plot_obj = ggplot() +
  xlim(x_min, x_max) + ylim(x_min^2, x_max^2)
for (nsim in 1 : min(Nsim, 100)){ #otherwise takes too long
  plot_obj = plot_obj + geom_abline(intercept = training_gs[nsim, 1], slope = training_gs[nsim, 2], col
}
plot_obj +
  geom_abline(intercept = g_average[1], slope = g_average[2], col = "red", lwd = 2) +
  ylim(-2,2)
```

```
## Scale for 'y' is already present. Adding another scale for 'y', which will
## replace the existing scale.
```




```
  # geom_line(data = f_x_df, aes(x, f), col = "green", size = 1)

x = seq(x_min, x_max, length.out = resolution)
expe_g_x = g_average[1] + g_average[2] * x
var_x_s = array(NA, Nsim)
for (nsim in 1 : Nsim){
  g_x = training_gs[nsim, 1] + training_gs[nsim, 2] * x
  var_x_s[nsim] = mean((g_x - expe_g_x)^2)
}
expe_var_g = mean(var_x_s)
expe_var_g
```

```
## [1] 0.0519264
```

```
mse
```

```
## [1] 0.5839188
```

```
sigma^2
```

```
## [1] 0.09
```

```
expe_bias_g_sq
```

```
## [1] 0.4416661
```

```
expe_var_g
```

```
## [1] 0.0519264
```

```
sigma^2 + expe_bias_g_sq + expe_var_g
```

```
## [1] 0.5835925
```

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

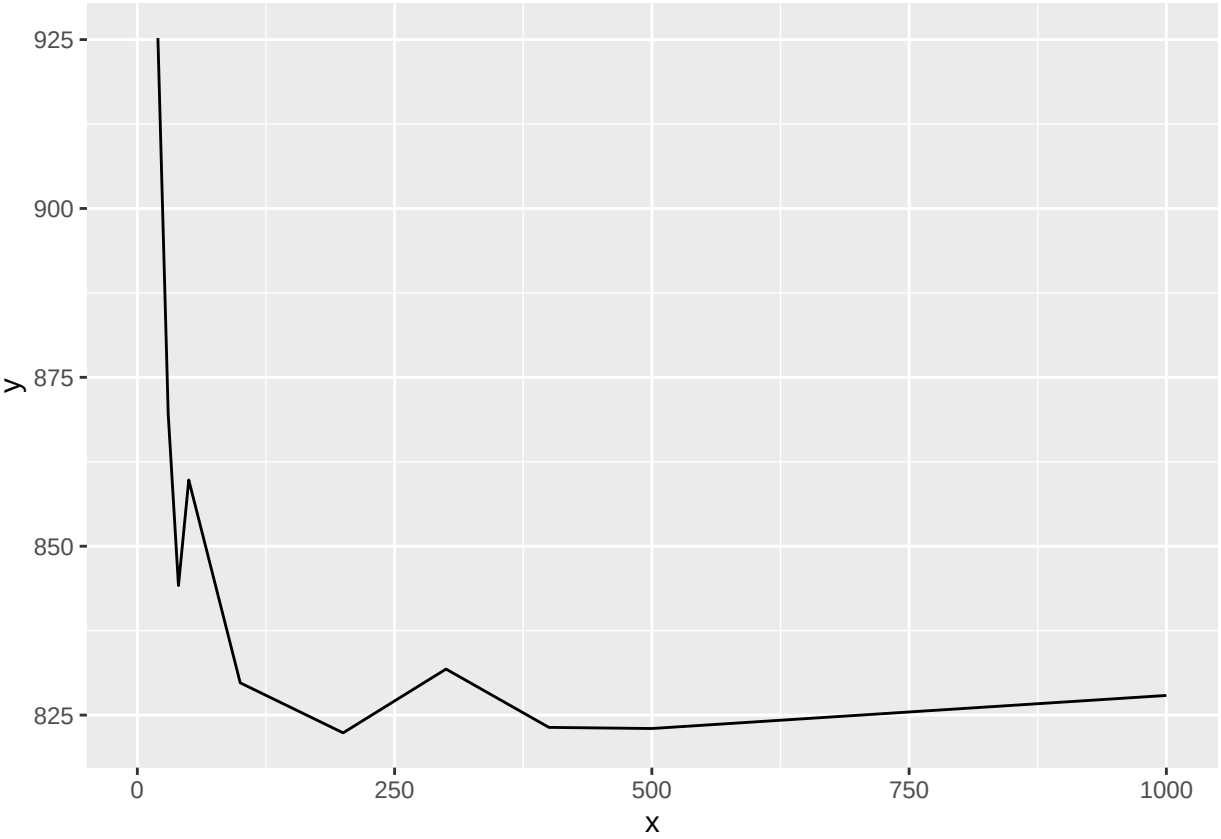
Take a sample of n = 2000 observations from the diamonds data.

```
pacman::p_load(dplyr)
diamond_samp = diamonds%>%
  sample_n(2000)
```

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`.

```
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 = diamond_samp, ntree = num_trees[i])
  oob_se_by_num_trees[i]= sd(diamond_samp$price-rf_mod$predicted)
}
ggplot(data.frame(x=num_trees, y=oob_se_by_num_trees)) +
  geom_line(aes(x=x, y=y))
```

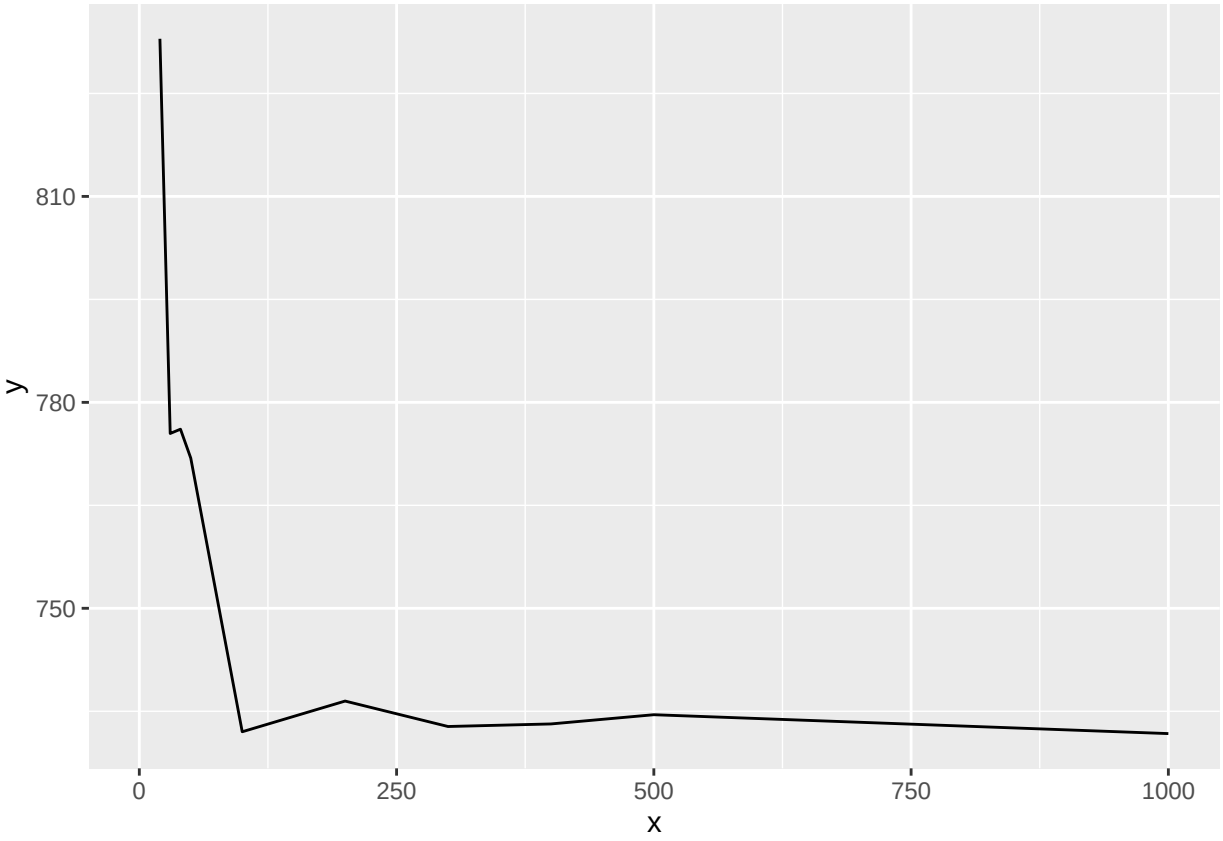
```
## Warning: Removed 4 row(s) containing missing values (geom_path).
```



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 = diamond_samp, ntree = num_trees[i], mtry = ncol(diamond_samp) -
  oob_se_by_num_trees_bag[i]= sd(diamond_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
```

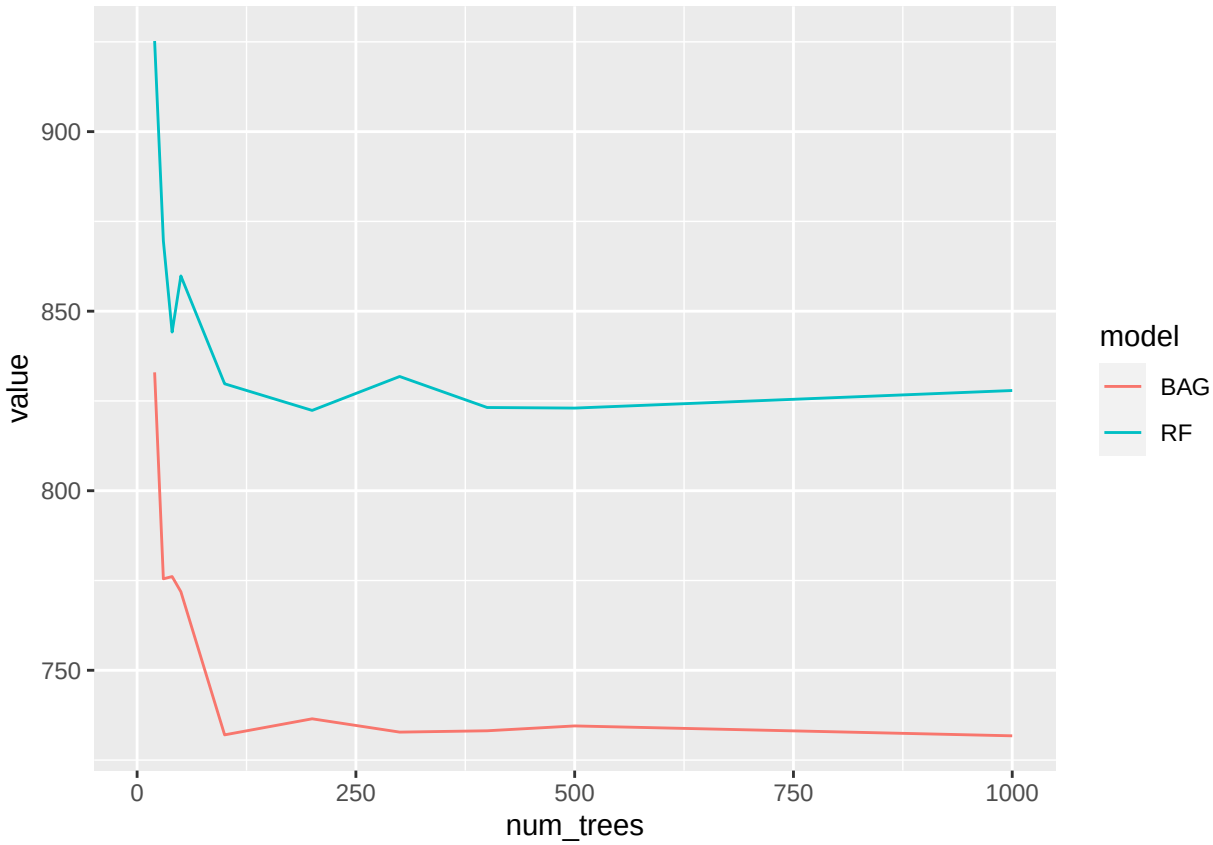
```
##  [1]        NA        NA        NA        NA 11.076936 12.133603  8.773124
##  [8] 11.392666 13.354636 11.660517 13.513981 12.279079 12.050748 13.141258
```

SE values for bagged trees was better than the RF model.

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

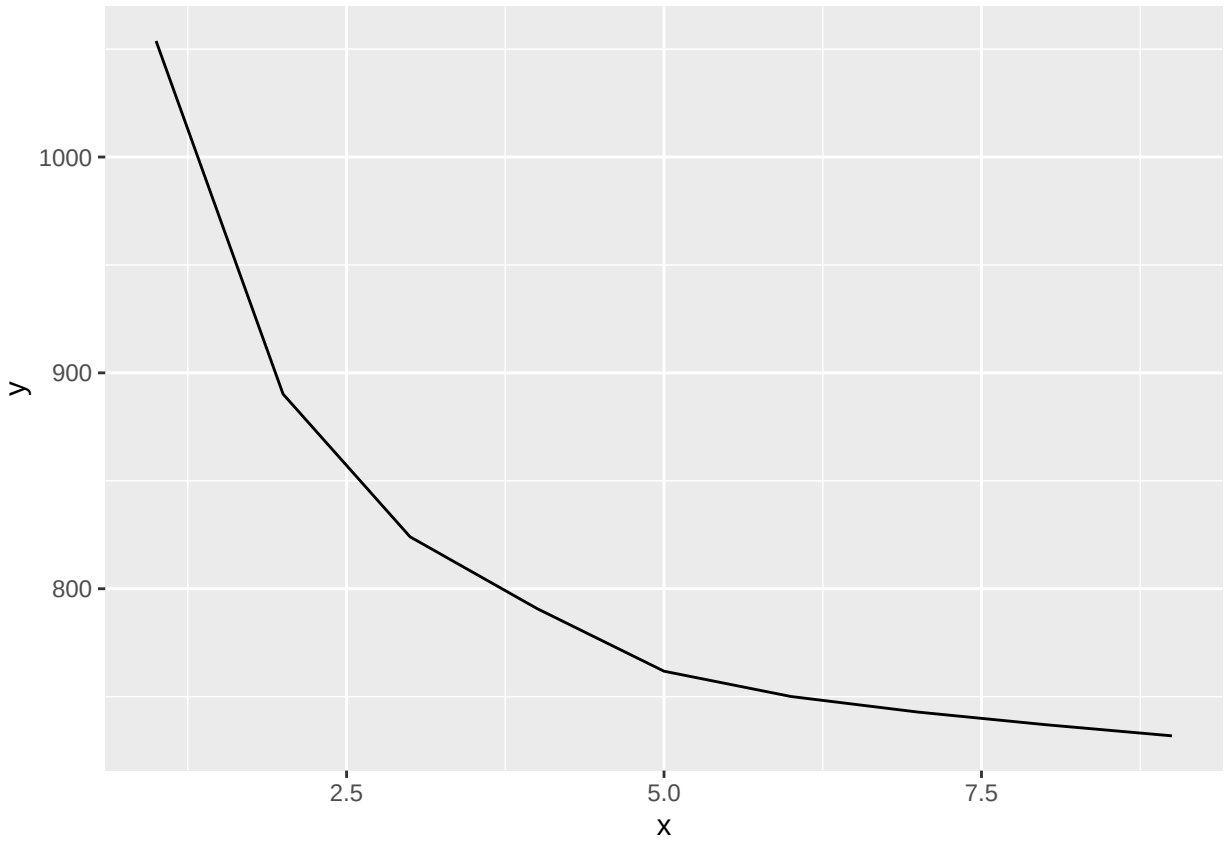
```
ggplot(rbind(data.frame(num_trees = num_trees, value = oob_se_by_num_trees, model= "RF"), data.frame(nu
  geom_line(aes(x = num_trees, y=value, color = model ))
```

```
## Warning: Removed 8 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 oob_s_e for all mtry values. Plot oob se by mtry

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

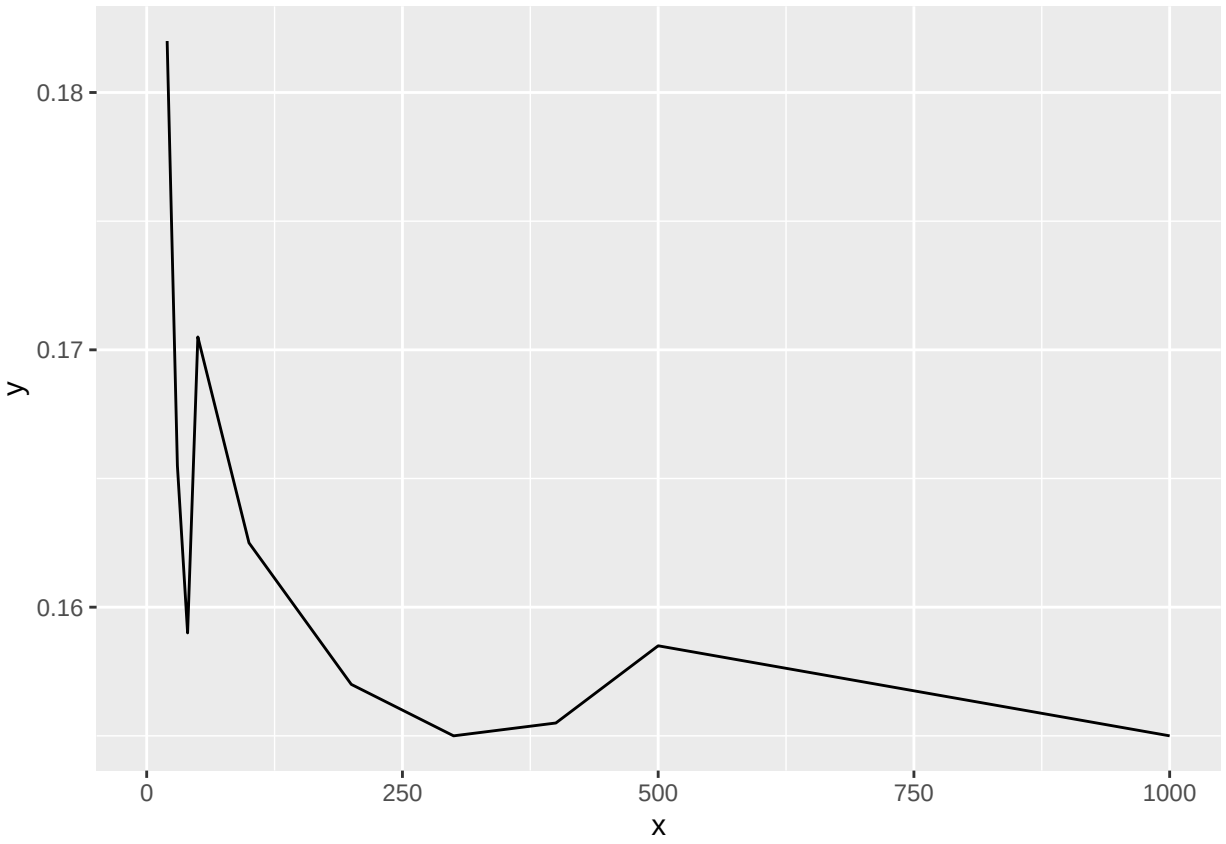
```
pacman::p_load_gh("coatless/ucidata")
data(adult)
adult = na.omit(adult) #kill any observations with missingness

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)#sd(adult_samp$income-rf_mod$pred
}
ggplot(data.frame(x=num_trees, y=oob_me_by_num_trees)) +
  geom_line(aes(x=x, y=y))
```

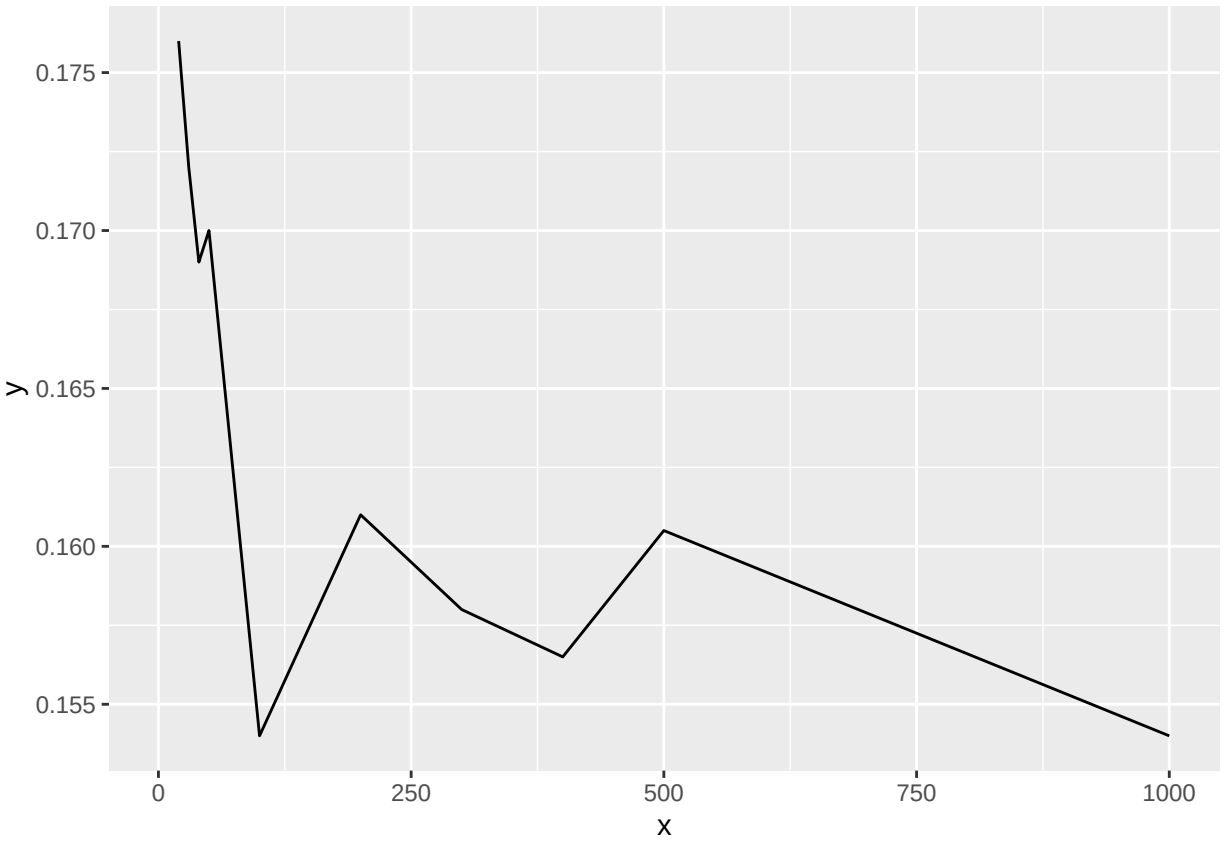
```
## Warning: Removed 4 row(s) containing missing values (geom_path).
```



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.

```
num_trees = c(1, 2, 5, 10, 20, 30, 40, 50, 100, 200, 300, 400, 500, 1000)
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])
  oob_me_by_num_trees_bag[i] = mean(adult_samp$income != rf_mod$predicted)#sd(adult_samp$income-rf_mod$
}
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?

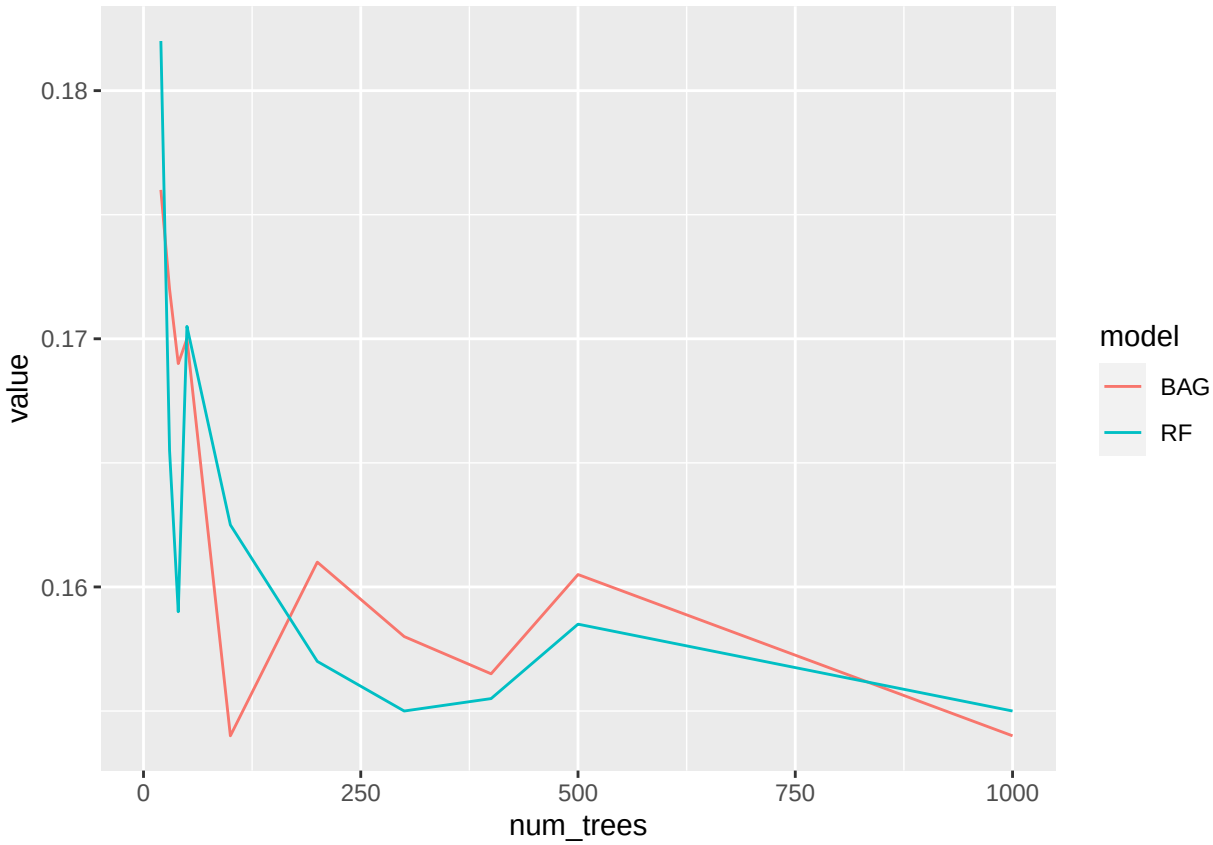
```
(oob_me_by_num_trees - oob_me_by_num_trees_bag)/oob_me_by_num_trees_bag *100
```

```
##  [1]         NA         NA         NA         NA  3.4090909 -3.7790698
##  [7] -5.9171598  0.2941176  5.5194805 -2.4844720 -1.8987342 -0.6389776
## [13] -1.2461059  0.6493506
```

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

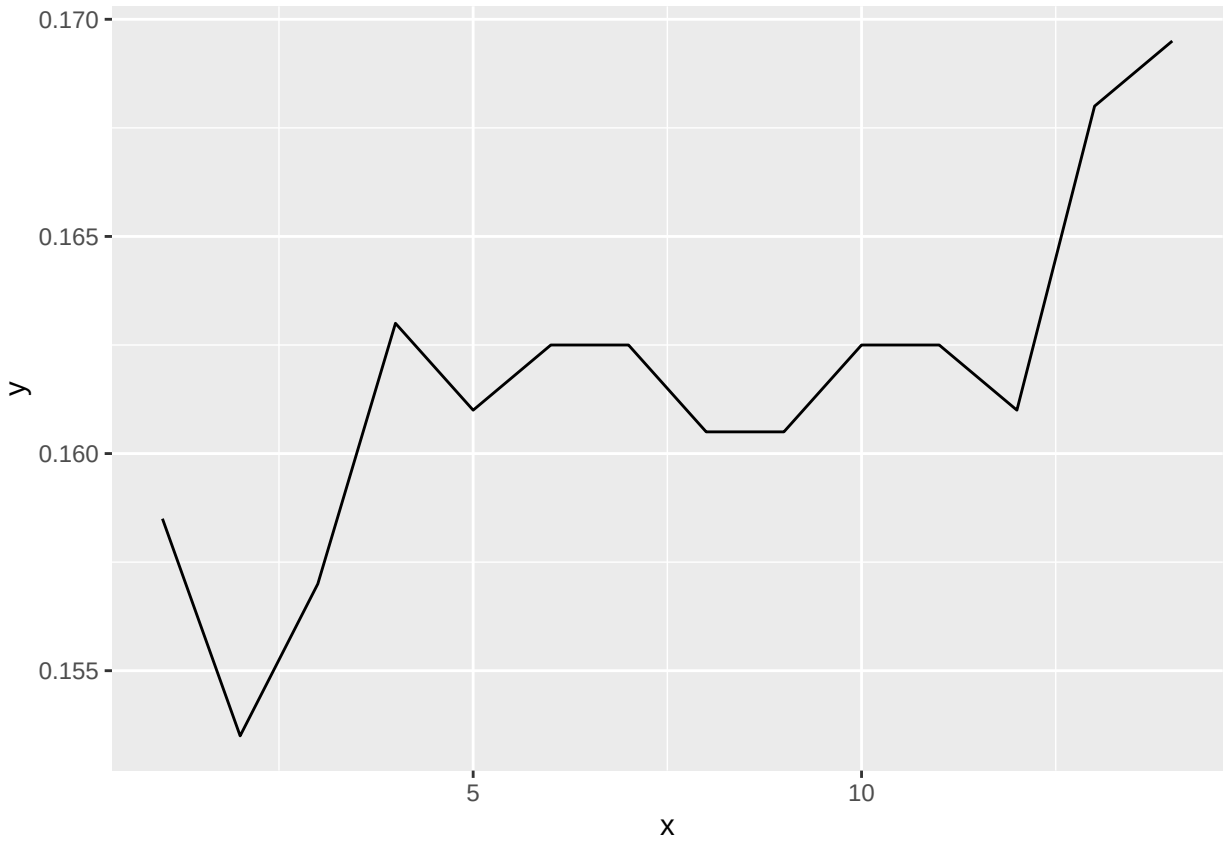
```
ggplot(rbind(data.frame(num_trees = num_trees, value = oob_me_by_num_trees, model= "RF"), data.frame(nu
  geom_line(aes(x = num_trees, y=value, color = model ))
```

```
## 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). Plot oob misclassification error by 'mtry'

```
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]= mean(adult_samp$income != rf_mod$predicted)
}
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`.

```
pacman :: p_load(dplyr)
random_bagged_ols = function(X, y, num_ols_model = 100, mtry = NULL) {

  lm_models = array(NA, num_ols_model)
  for(i in 1:num_ols_model) {
    number_columns = round(runif(1, min = 1, max = ncol(X)))
    Xtrain = X[ , sample(ncol(X), number_columns)]

    n_0 = round(runif(1, min = 1, max = nrow(X)))
    n_1 = round(runif(n_0, min = 1, max = nrow(X)))

    Xmatrix = Xtrain[0:n_0]
    for(i in 1:n_0) {
      Xmatrix[i,] = Xtrain[n1[i],]
    }

    yvec = array (NA, n_0)
    for(i in 1:n_0) {
      yvec[i] = y[n_1[i]]
    }
```

```
    mod = lm(yvec ~ .+0, data.frame(Xmatrix))
    lm_models[i] = c(mod$coefficients)
  }

  lm_models
}
```

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

```
pacman :: p_load(MASS)
data(Boston)
y = Boston$medv
X = Boston
X$medv = NULL
#lm_models = random_bagged_ols(X,y)
```

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(prob_missing, X) {
  n = nrow(X)
  p = ncol(X)
random_holes = matrix(nrow=n, ncol=p, sample(c(rep(0, n*p*(1-prob_missing)), rep(1, n*p*prob_missing))))
  for(i in 1:n){
    for(j in 1:p) {
      if(random_holes[i,j] == 1){
        X[i,j] = NA
      }
    }
  }
X
}
```

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

```
Xmiss = punch_holes(0.1, X)
```

```
## Warning in matrix(nrow = n, ncol = p, sample(c(rep(0, n * p * (1 -
## prob_missing)), : data length [6577] is not a sub-multiple or multiple of the
## number of rows [506]
```

```
Xmiss
```

```
##         crim    zn indus chas    nox    rm   age     dis rad tax ptratio  black
## 1    0.00632  18.0  2.31    0 0.5380 6.575  65.2  4.0900   1 296    15.3 396.90
## 2    0.02731   0.0    NA    0 0.4690 6.421  78.9  4.9671   2 242    17.8 396.90
## 3    0.02729   0.0  7.07   NA 0.4690 7.185  61.1  4.9671   2 242    17.8 392.83
## 4    0.03237   0.0    NA    0 0.4580 6.998    NA  6.0622   3 222    18.7 394.63
## 5    0.06905   0.0  2.18    0 0.4580 7.147    NA      NA   3 222    18.7 396.90
## 6    0.02985   0.0  2.18    0 0.4580 6.430  58.7  6.0622   3 222    18.7 394.12
## 7    0.08829  12.5  7.87    0 0.5240 6.012  66.6  5.5605   5 311    15.2 395.60
## 8    0.14455  12.5  7.87    0 0.5240 6.172  96.1  5.9505   5 311    15.2     NA
## 9    0.21124  12.5  7.87    0 0.5240 5.631 100.0  6.0821   5 311      NA 386.63
## 10   0.17004  12.5  7.87    0 0.5240    NA  85.9  6.5921   5 311      NA 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  12.5  7.87    0 0.5240 6.009    NA  6.2267   5 311    15.2 396.90
## 13   0.09378  12.5  7.87    0     NA 5.889  39.0  5.4509   5 311      NA 390.50
```

```
## 14       NA   0.0  8.14    0 0.5380 5.949  61.8  4.7075   4 307    21.0     NA
## 15  0.63796   0.0  8.14    0 0.5380    NA  84.5  4.4619  NA  NA      NA 380.02
## 16  0.62739   0.0  8.14    0 0.5380 5.834  56.5  4.4986   4 307      NA 395.62
## 17  1.05393   0.0  8.14    0 0.5380 5.935  29.3  4.4986   4 307    21.0 386.85
## 18  0.78420   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  36.6  3.7965   4 307    21.0 288.99
## 20  0.72580   0.0  8.14    0 0.5380 5.727  69.5  3.7965   4 307    21.0 390.95
## 21  1.25179    NA  8.14    0 0.5380 5.570  98.1  3.7979   4 307      NA 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       NA   0.0  8.14    0 0.5380 6.142  91.7  3.9769  NA 307    21.0     NA
## 24  0.98843   0.0  8.14    0 0.5380 5.813 100.0  4.0952  NA 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   0.0  8.14    0 0.5380 5.599  85.7  4.4546   4 307    21.0 303.42
## 27       NA   0.0  8.14    0 0.5380 5.813  90.3  4.6820   4 307      NA 376.88
## 28  0.95577   0.0  8.14    0 0.5380 6.047  88.8  4.4534   4 307    21.0 306.38
## 29  0.77299   0.0  8.14    0 0.5380 6.495  94.4      NA   4 307    21.0 387.94
## 30  1.00245   0.0  8.14   NA      NA 6.674    NA  4.2390   4 307    21.0 380.23
## 31  1.13081    NA    NA    0 0.5380 5.713  94.1  4.2330   4  NA    21.0 360.17
## 32  1.35472   0.0  8.14    0 0.5380 6.072 100.0  4.1750   4  NA    21.0 376.73
## 33  1.38799   0.0    NA    0 0.5380 5.950  82.0      NA   4 307    21.0     NA
## 34       NA   0.0  8.14    0 0.5380 5.701  95.0  3.7872   4 307      NA 358.77
## 35  1.61282   0.0  8.14    0 0.5380 6.096  96.9  3.7598   4 307      NA 248.31
## 36  0.06417   0.0  5.96    0 0.4990    NA  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   5 279    19.2 377.56
## 38  0.08014   0.0    NA    0 0.4990    NA  41.5  3.9342   5 279      NA 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  75.0  2.95    0 0.4280 6.595  21.8  5.4011   3 252    18.3 395.63
## 41  0.03359  75.0  2.95    0 0.4280 7.024    NA  5.4011   3 252    18.3 395.62
## 42  0.12744   0.0  6.91    0 0.4480 6.770   2.9  5.7209   3 233    17.9 385.41
## 43  0.14150   0.0  6.91    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   6.5  5.7209   3 233    17.9 394.46
## 45  0.12269   0.0  6.91    0     NA 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      NA   3 233    17.9 396.90
## 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    NA  5.8700   3 233    17.9 396.90
## 50  0.21977   0.0  6.91    0 0.4480 5.602  62.0  6.0877   3 233    17.9 396.90
## 51  0.08873    NA  5.64    0 0.4390 5.963    NA      NA  NA 243    16.8     NA
## 52  0.04337  21.0  5.64    0 0.4390 6.115  63.0  6.8147   4 243    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  0.04981  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 5.888  47.6  7.3197  NA 469    21.1     NA
## 56  0.01311  90.0  1.22    0 0.4030 7.249  21.9      NA   5 226    17.9 395.93
## 57  0.02055  85.0  0.74    0 0.4100 6.383  35.7      NA   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    NA    NA    0 0.4530 6.145  29.2  7.8148   8 284    19.7     NA
## 60  0.10328  25.0    NA    0 0.4530 5.927  47.2  6.9320   8 284    19.7 396.90
## 61  0.14932  25.0  5.13   NA      NA 5.741  66.2  7.2254   8 284    19.7 395.11
## 62  0.17171    NA  5.13    0 0.4530 5.966  93.4  6.8185   8 284    19.7 378.08
## 63  0.11027  25.0  5.13    0 0.4530 6.456  67.8  7.2255   8 284      NA 396.90
## 64  0.12650  25.0    NA    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  9.2229   3  NA    18.6 393.24
## 66  0.03584  80.0  3.37    0     NA 6.290  17.8  6.6115  NA 337    16.1 396.90
## 67  0.04379  80.0  3.37    0     NA 5.787  31.1  6.6115   4 337    16.1 396.90
```

```
## 68   0.05789  12.5  6.07    0 0.4090 5.878  21.4  6.4980   4 345    18.9 396.21
## 69        NA  12.5  6.07    0 0.4090 5.594  36.8  6.4980   4 345    18.9     NA
## 70   0.12816  12.5  6.07    0 0.4090 5.885    NA  6.4980   4 345    18.9     NA
## 71   0.08826    NA    NA    0 0.4130 6.417   6.6  5.2873   4 305      NA 383.73
## 72   0.15876   0.0 10.81    0 0.4130 5.961  17.5      NA  NA 305      NA 376.94
## 73   0.09164   0.0 10.81    0 0.4130 6.065   7.8  5.2873   4 305    19.2 390.91
## 74        NA   0.0 10.81    0 0.4130 6.245   6.2  5.2873   4 305    19.2 377.17
## 75        NA   0.0 12.83    0 0.4370 6.273   6.0  4.2515   5 398      NA 394.92
## 76        NA   0.0 12.83    0 0.4370 6.286    NA  4.5026   5 398    18.7 383.23
## 77   0.10153    NA    NA    0 0.4370 6.279  74.5  4.0522   5 398    18.7 373.66
## 78        NA   0.0 12.83    0 0.4370 6.140  45.8  4.0905   5 398      NA 386.96
## 79   0.05646   0.0    NA    0 0.4370 6.232  53.7  5.0141   5 398    18.7 386.40
## 80   0.08387   0.0 12.83    0 0.4370 5.874  36.6      NA   5 398      NA     NA
## 81   0.04113    NA  4.86    0 0.4260 6.727  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  NA 281    19.0 395.63
## 83   0.03659  25.0  4.86    0 0.4260 6.302  32.2  5.4007   4 281    19.0 396.90
## 84   0.03551  25.0  4.86    0 0.4260 6.167  46.7  5.4007   4 281      NA 390.64
## 85   0.05059   0.0  4.49    0 0.4490 6.389  48.0  4.7794   3 247    18.5 396.90
## 86   0.05735   0.0  4.49    0 0.4490 6.630  56.1  4.4377   3 247      NA 392.30
## 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 0.4490 6.121    NA  3.7476   3 247    18.5 395.15
## 89   0.05660   0.0  3.41    0 0.4890    NA    NA  3.4217   2 270    17.8     NA
## 90   0.05302   0.0  3.41   NA 0.4890 7.079  63.1  3.4145   2 270    17.8 396.06
## 91        NA   0.0  3.41    0 0.4890 6.417  66.1  3.0923   2 270    17.8 392.18
## 92   0.03932   0.0    NA    0 0.4890 6.405  73.9  3.0921   2 270    17.8 393.55
## 93   0.04203  28.0 15.04    0 0.4640 6.442  53.6  3.6659   4 270      NA 395.01
## 94        NA  28.0 15.04    0 0.4640 6.211  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        NA    NA  2.89    0     NA 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  NA 276    18.0 391.83
## 98   0.12083   0.0  2.89    0     NA 8.069  76.0  3.4952   2 276    18.0 396.90
## 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      NA 396.90
## 101  0.14866    NA  8.56    0 0.5200 6.727  79.9  2.7778   5 384    20.9 394.76
## 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   NA 0.5200 6.405  85.4  2.7147   5 384    20.9  70.80
## 104  0.21161   0.0  8.56    0     NA 6.137  87.4  2.7147   5 384    20.9 394.47
## 105       NA   0.0  8.56    0 0.5200 6.167  90.0  2.4210   5 384    20.9     NA
## 106  0.13262   0.0  8.56    0 0.5200 5.851  96.7  2.1069   5 384    20.9 394.05
## 107  0.17120   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  0.12802   0.0  8.56    0 0.5200 6.474  97.1  2.4329   5 384    20.9 395.24
## 110  0.26363   0.0  8.56    0 0.5200 6.229  91.2  2.5451   5 384    20.9 391.23
## 111  0.10793   0.0  8.56    0 0.5200 6.195  54.4  2.7778  NA 384    20.9     NA
## 112  0.10084   0.0 10.01    0 0.5470 6.715  81.6      NA   6 432    17.8 395.59
## 113  0.12329   0.0    NA    0 0.5470 5.913  92.9      NA   6 432      NA 394.95
## 114       NA   0.0 10.01    0 0.5470 6.092  95.4  2.5480   6 432    17.8 396.90
## 115  0.14231    NA 10.01    0 0.5470 6.254  84.2  2.2565  NA  NA    17.8 388.74
## 116  0.17134   0.0 10.01   NA 0.5470 5.928  88.2  2.4631   6 432    17.8 344.91
## 117       NA   0.0    NA    0 0.5470 6.176  72.5      NA   6 432    17.8 393.30
## 118  0.15098   0.0 10.01    0 0.5470 6.021  82.6  2.7474   6  NA    17.8 394.51
## 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    NA  2.7592   6 432    17.8 391.50
## 121  0.06899    NA 25.65    0 0.5810    NA  69.7  2.2577   2 188    19.1     NA
```

```
## 122  0.07165   0.0 25.65    0 0.5810 6.004  84.1  2.1974   2 188    19.1 377.67
## 123  0.09299   0.0 25.65    0 0.5810 5.961  92.9  2.0869   2 188    19.1     NA
## 124  0.15038   0.0 25.65    0 0.5810 5.856  97.0  1.9444   2 188    19.1 370.31
## 125  0.09849   0.0    NA    0 0.5810 5.879  95.8  2.0063   2 188    19.1 379.38
## 126  0.16902   0.0 25.65    0 0.5810 5.986    NA  1.9929  NA 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   0.0 21.89    0 0.6240 5.693  96.0  1.7883   4 437    21.2     NA
## 129  0.32543   0.0 21.89    0 0.6240 6.431  98.8  1.8125   4  NA    21.2 396.90
## 130  0.88125   0.0 21.89    0 0.6240 5.637  94.7  1.9799   4 437    21.2 396.90
## 131  0.34006   0.0 21.89    0 0.6240 6.458  98.9      NA   4 437    21.2 395.04
## 132  1.19294   0.0 21.89    0 0.6240 6.326    NA  2.2710   4 437    21.2 396.90
## 133  0.59005   0.0 21.89    0 0.6240 6.372  97.9  2.3274   4  NA    21.2     NA
## 134       NA   0.0 21.89    0 0.6240 5.822  95.4  2.4699   4 437    21.2 388.69
## 135  0.97617   0.0 21.89    0 0.6240 5.757  98.4  2.3460   4 437      NA 262.76
## 136       NA   0.0 21.89    0      NA 6.335  98.2  2.1107   4 437    21.2 394.67
## 137       NA   0.0 21.89    0      NA 5.942  93.5      NA   4 437    21.2 378.25
## 138  0.35233   0.0 21.89    0 0.6240    NA  98.4  1.8498   4 437    21.2     NA
## 139  0.24980   0.0 21.89    0 0.6240 5.857  98.2  1.6686   4 437    21.2     NA
## 140       NA   0.0 21.89    0 0.6240 6.151  97.9  1.6687   4 437    21.2     NA
## 141  0.29090   0.0    NA    0 0.6240 6.174  93.6  1.6119   4 437    21.2 388.08
## 142  1.62864   0.0 21.89    0      NA    NA 100.0      NA   4 437    21.2     NA
## 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    NA    0 0.8710 5.468 100.0  1.4118   5 403    14.7 396.90
## 145  2.77974   0.0 19.58    0 0.8710 4.903  97.8  1.3459   5  NA    14.7 396.90
## 146  2.37934   0.0    NA    0 0.8710 6.130 100.0  1.4191   5  NA    14.7 172.91
## 147  2.15505   0.0 19.58   NA      NA 5.628 100.0  1.5166  NA 403    14.7 169.27
## 148  2.36862    NA 19.58    0 0.8710 4.926  95.7  1.4608   5 403    14.7 391.71
## 149  2.33099   0.0 19.58    0 0.8710 5.186  93.8  1.5296   5  NA    14.7 356.99
## 150  2.73397   0.0    NA    0 0.8710 5.597  94.9      NA   5  NA    14.7 351.85
## 151  1.65660   0.0 19.58   NA 0.8710 6.122  97.3  1.6180   5 403    14.7 372.80
## 152  1.49632   0.0 19.58    0 0.8710 5.404 100.0  1.5916  NA 403    14.7     NA
## 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 0.8710 5.709  98.5  1.6232   5 403    14.7     NA
## 155  1.41385   0.0    NA    1 0.8710 6.129    NA  1.7494   5 403    14.7 321.02
## 156       NA   0.0 19.58    1      NA 6.152  82.6      NA   5 403    14.7  88.01
## 157  2.44668   0.0 19.58    0      NA 5.272  94.0  1.7364   5 403    14.7     NA
## 158       NA   0.0 19.58    0 0.6050 6.943  97.4  1.8773   5 403      NA 363.43
## 159  1.34284   0.0 19.58    0      NA 6.066 100.0  1.7573  NA 403    14.7 353.89
## 160  1.42502   0.0 19.58   NA      NA 6.510 100.0  1.7659   5 403    14.7 364.31
## 161  1.27346   0.0 19.58    1 0.6050 6.250  92.6  1.7984   5 403    14.7 338.92
## 162  1.46336   0.0 19.58    0 0.6050    NA  90.8  1.9709   5 403    14.7 374.43
## 163  1.83377   0.0 19.58    1 0.6050 7.802  98.2  2.0407  NA  NA    14.7 389.61
## 164  1.51902   0.0 19.58    1 0.6050 8.375  93.9  2.1620   5 403    14.7 388.45
## 165  2.24236   0.0 19.58    0      NA 5.854  91.8  2.4220   5 403      NA 395.11
## 166  2.92400   0.0 19.58   NA 0.6050 6.101    NA      NA   5 403    14.7 240.16
## 167  2.01019   0.0 19.58    0      NA 7.929    NA  2.0459   5 403    14.7 369.30
## 168  1.80028   0.0 19.58    0 0.6050 5.877    NA  2.4259   5 403    14.7 227.61
## 169  2.30040   0.0 19.58    0 0.6050 6.319  96.1  2.1000  NA 403    14.7 297.09
## 170  2.44953   0.0 19.58    0      NA 6.402  95.2  2.2625   5 403    14.7 330.04
## 171  1.20742   0.0 19.58    0 0.6050 5.875  94.6      NA   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     NA
## 173  0.13914    NA  4.05    0 0.5100    NA  88.5  2.5961   5  NA    16.6 396.90
## 174  0.09178   0.0  4.05    0 0.5100 6.416  84.1  2.6463   5  NA      NA 395.50
## 175  0.08447    NA  4.05    0 0.5100 5.859  68.7  2.7019   5 296      NA 393.23
```

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## 176  0.06664   0.0  4.05    0 0.5100 6.546  33.1  3.1323   5  NA    16.6 390.96
## 177  0.07022   0.0  4.05    0 0.5100 6.020  47.2  3.5549   5 296    16.6 393.23
## 178  0.05425   0.0  4.05    0 0.5100 6.315  73.4  3.3175   5 296      NA 395.60
## 179  0.06642   0.0  4.05    0 0.5100 6.860    NA      NA   5  NA      NA 391.27
## 180  0.05780   0.0  2.46    0 0.4880 6.980  58.4  2.8290   3 193      NA     NA
## 181  0.06588   0.0  2.46    0 0.4880 7.765  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    17.8 396.90
## 183  0.09103   0.0  2.46    0 0.4880 7.155  92.2  2.7006   3 193    17.8 394.12
## 184  0.10008   0.0  2.46   NA 0.4880 6.563  95.6  2.8470   3 193    17.8     NA
## 185  0.08308   0.0  2.46    0 0.4880 5.604  89.8      NA   3 193      NA 391.00
## 186  0.06047   0.0  2.46    0 0.4880 6.153  68.8  3.2797   3 193    17.8 387.11
## 187  0.05602   0.0    NA    0 0.4880 7.831  53.6      NA   3 193    17.8 392.63
## 188  0.07875  45.0  3.44   NA 0.4370 6.782  41.1  3.7886   5 398    15.2 393.87
## 189  0.12579    NA  3.44    0 0.4370    NA    NA      NA   5 398    15.2 382.84
## 190  0.08370  45.0    NA    0 0.4370 7.185  38.9  4.5667   5 398    15.2 396.90
## 191  0.09068  45.0    NA    0 0.4370 6.951    NA  6.4798  NA 398    15.2     NA
## 192  0.06911  45.0  3.44    0     NA 6.739  30.8  6.4798   5 398    15.2 389.71
## 193  0.08664  45.0  3.44    0 0.4370    NA  26.3  6.4798   5 398    15.2 390.49
## 194  0.02187  60.0  2.93    0 0.4010 6.800   9.9  6.2196   1 265      NA 393.37
## 195  0.01439  60.0  2.93    0 0.4010 6.604  18.8  6.2196   1 265      NA 376.70
## 196  0.01381  80.0  0.46    0 0.4220 7.875    NA  5.6484   4 255    14.4     NA
## 197  0.04011  80.0  1.52    0 0.4040 7.287  34.1      NA   2 329    12.6 396.90
## 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      NA 392.20
## 200  0.03150  95.0  1.47    0 0.4030 6.975  15.3  7.6534   3 402    17.0     NA
## 201  0.01778  95.0  1.47    0 0.4030 7.135  13.9  7.6534   3 402    17.0 384.30
## 202  0.03445  82.5  2.03    0 0.4150    NA  38.4  6.2700   2 348    14.7 393.77
## 203       NA  82.5  2.03    0 0.4150 7.610  15.7  6.2700   2 348    14.7 395.38
## 204  0.03510  95.0  2.68    0 0.4161 7.853  33.2      NA   4 224    14.7 392.78
## 205  0.02009  95.0  2.68    0 0.4161 8.034  31.9  5.1180   4 224    14.7 390.55
## 206  0.13642   0.0 10.59    0 0.4890 5.891  22.3  3.9454   4 277    18.6 396.90
## 207  0.22969   0.0 10.59   NA 0.4890 6.326    NA  4.3549   4 277    18.6     NA
## 208  0.25199    NA 10.59    0 0.4890 5.783  72.7  4.3549   4 277    18.6 389.43
## 209  0.13587   0.0    NA   NA 0.4890 6.064  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   4 277    18.6 396.90
## 211  0.17446   0.0 10.59    1 0.4890 5.960  92.1      NA   4 277    18.6 393.25
## 212  0.37578   0.0 10.59    1 0.4890 5.404  88.6  3.6650   4 277    18.6 395.24
## 213  0.21719   0.0 10.59    1 0.4890 5.807  53.8  3.6526   4 277    18.6 390.94
## 214  0.14052   0.0 10.59    0 0.4890 6.375  32.3  3.9454   4 277      NA 385.81
## 215  0.28955   0.0 10.59    0 0.4890 5.412   9.8      NA   4  NA    18.6 348.93
## 216  0.19802   0.0 10.59    0 0.4890 6.182  42.4  3.9454   4  NA    18.6 393.63
## 217  0.04560   0.0 13.89    1 0.5500 5.888  56.0  3.1121   5 276    16.4 392.80
## 218  0.07013   0.0 13.89    0     NA 6.642    NA  3.4211   5 276    16.4 392.78
## 219  0.11069    NA 13.89    1 0.5500 5.951  93.8  2.8893   5 276    16.4 396.90
## 220  0.11425   0.0 13.89    1 0.5500 6.373  92.4      NA  NA 276    16.4 393.74
## 221  0.35809   0.0    NA    1 0.5070 6.951  88.5  2.8617   8 307    17.4     NA
## 222  0.40771   0.0    NA    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      NA   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  6.20    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    17.4 382.00
## 227       NA   0.0  6.20    0 0.5040 8.040  86.5  3.2157   8 307    17.4 387.38
## 228  0.41238   0.0  6.20    0 0.5040 7.163    NA  3.2157   8 307    17.4 372.08
## 229  0.29819   0.0  6.20    0 0.5040    NA    NA  3.3751   8 307    17.4     NA
```

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## 230  0.44178   0.0  6.20   NA 0.5040 6.552  21.4  3.3751   8 307      NA 380.34
## 231  0.53700   0.0  6.20    0 0.5040 5.981  68.1  3.6715   8 307    17.4 378.35
## 232  0.46296   0.0  6.20    0 0.5040 7.412    NA  3.6715   8 307      NA 376.14
## 233       NA   0.0  6.20    0 0.5070 8.337  73.3  3.8384   8 307    17.4 385.91
## 234  0.33147   0.0  6.20    0 0.5070    NA  70.4  3.6519   8  NA    17.4 378.95
## 235  0.44791   0.0  6.20    1 0.5070 6.726  66.5      NA  NA 307    17.4 360.20
## 236  0.33045   0.0  6.20    0 0.5070 6.086  61.5  3.6519   8 307    17.4 376.75
## 237  0.52058   0.0  6.20   NA 0.5070 6.631  76.5  4.1480   8 307    17.4 388.45
## 238  0.51183   0.0  6.20   NA 0.5070 7.358  71.6  4.1480   8 307    17.4 390.07
## 239  0.08244  30.0  4.93    0 0.4280 6.481  18.5  6.1899   6 300    16.6      NA
## 240  0.09252  30.0  4.93    0 0.4280 6.606  42.2  6.1899   6 300    16.6 383.78
## 241  0.11329  30.0  4.93    0 0.4280 6.897  54.3      NA   6 300    16.6 391.25
## 242       NA  30.0  4.93    0 0.4280 6.095  65.1  6.3361   6  NA    16.6 394.62
## 243  0.10290  30.0  4.93    0 0.4280 6.358  52.9  7.0355   6 300    16.6 372.75
## 244  0.12757  30.0  4.93    0 0.4280 6.393   7.8  7.0355   6 300    16.6 374.71
## 245  0.20608  22.0  5.86    0 0.4310 5.593  76.5  7.9549  NA 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  0.33983  22.0  5.86    0 0.4310 6.108    NA  8.0555   7 330    19.1      NA
## 248  0.19657  22.0  5.86    0 0.4310 6.226  79.2  8.0555   7 330    19.1 376.14
## 249  0.16439  22.0  5.86    0 0.4310 6.433  49.1  7.8265   7 330    19.1      NA
## 250  0.19073  22.0  5.86    0      NA 6.718  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  NA 330    19.1 396.28
## 252  0.21409  22.0    NA   NA 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    19.1 386.09
## 254       NA  22.0    NA    0 0.4310 8.259    NA  8.9067   7 330    19.1 396.90
## 255  0.04819  80.0    NA    0 0.3920 6.108  32.0  9.2203   1 315    16.4 392.89
## 256  0.03548  80.0  3.64    0 0.3920 5.876  19.1  9.2203   1 315      NA 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   NA 0.6470 8.704  86.9  1.8010   5 264    13.0      NA
## 259  0.66351  20.0  3.97   NA 0.6470    NA 100.0  1.8946   5 264    13.0 383.29
## 260  0.65665    NA  3.97    0      NA 6.842 100.0  2.0107   5 264    13.0 391.93
## 261  0.54011  20.0  3.97    0 0.6470 7.203  81.8      NA   5 264    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    NA    0 0.6470 8.398  91.5      NA   5 264    13.0 386.86
## 264  0.82526  20.0  3.97    0 0.6470    NA  94.5  2.0788   5 264    13.0 393.42
## 265  0.55007  20.0  3.97    0 0.6470 7.206  91.6  1.9301   5 264    13.0 387.89
## 266  0.76162  20.0  3.97    0 0.6470 5.560  62.8  1.9865   5 264    13.0      NA
## 267  0.78570  20.0  3.97    0 0.6470 7.014  84.6      NA   5 264    13.0 384.07
## 268  0.57834  20.0  3.97    0 0.5750 8.297  67.0  2.4216   5 264    13.0 384.54
## 269  0.54050  20.0  3.97    0      NA 7.470  52.6  2.8720   5 264    13.0 390.30
## 270  0.09065  20.0  6.96    1 0.4640    NA  61.5      NA   3 223    18.6      NA
## 271       NA  20.0  6.96    0 0.4640 5.856  42.1  4.4290   3 223    18.6 388.65
## 272  0.16211  20.0  6.96    0 0.4640 6.240    NA  4.4290   3 223    18.6 396.90
## 273  0.11460  20.0  6.96    0 0.4640 6.538  58.7  3.9175   3 223    18.6      NA
## 274  0.22188  20.0  6.96    1 0.4640 7.691    NA      NA   3 223    18.6 390.77
## 275  0.05644  40.0  6.41    1 0.4470 6.758  32.9  4.0776   4 254    17.6 396.90
## 276  0.09604  40.0  6.41   NA 0.4470 6.854    NA  4.2673   4 254    17.6 396.90
## 277  0.10469  40.0  6.41    1 0.4470 7.267  49.0  4.7872   4 254    17.6 389.25
## 278  0.06127  40.0  6.41    1 0.4470 6.826  27.6  4.8628   4 254    17.6 393.45
## 279  0.07978  40.0  6.41   NA 0.4470 6.482    NA  4.1403   4 254    17.6 396.90
## 280       NA  20.0  3.33   NA 0.4429 6.812  32.2  4.1007   5 216    14.9 396.90
## 281  0.03578  20.0  3.33    0 0.4429 7.820  64.5  4.6947   5 216    14.9      NA
## 282  0.03705  20.0  3.33    0 0.4429 6.968  37.2      NA   5 216    14.9 392.23
## 283  0.06129  20.0  3.33    1 0.4429 7.645  49.7  5.2119   5 216    14.9 377.07
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## 284  0.01501  90.0  1.21    1     NA 7.923    NA  5.8850   1 198    13.6 395.52
## 285  0.00906  90.0  2.97   NA 0.4000 7.088  20.8  7.3073   1 285    15.3 394.72
## 286  0.01096  55.0  2.25    0 0.3890 6.453  31.9  7.3073   1 300      NA 394.72
## 287  0.01965  80.0  1.76   NA 0.3850 6.230    NA  9.0892   1 241    18.2 341.60
## 288  0.03871  52.5  5.32    0 0.4050    NA  31.3  7.3172   6 293    16.6 396.90
## 289  0.04590  52.5  5.32    0 0.4050 6.315  45.6  7.3172   6 293    16.6 396.90
## 290  0.04297  52.5  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 6.861  27.9  5.1167   4  NA    19.2 396.90
## 292       NA  80.0  4.95    0 0.4110 7.148  27.7  5.1167   4  NA    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    NA    NA    0 0.4370 6.127  18.4      NA   4 289    16.0 396.90
## 295  0.08199   0.0 13.92    0 0.4370    NA    NA      NA   4 289      NA     NA
## 296  0.12932   0.0    NA    0 0.4370 6.678    NA  5.9604   4 289    16.0 396.90
## 297       NA   0.0 13.92    0 0.4370 6.549  51.0  5.9604  NA 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    NA  20.1  7.8278   5 358    14.8 368.24
## 300  0.05561  70.0    NA    0     NA 7.041  10.0  7.8278   5 358    14.8 371.58
## 301  0.04417    NA  2.24    0 0.4000 6.871  47.4  7.8278   5 358      NA 390.86
## 302  0.03537  34.0  6.09    0 0.4330 6.590  40.4  5.4917   7 329    16.1 395.75
## 303  0.09266  34.0  6.09    0 0.4330 6.495  18.4      NA   7 329    16.1     NA
## 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  2.18    0 0.4720 7.236  41.1  4.0220   7 222    18.4 393.68
## 306  0.05479  33.0  2.18    0 0.4720    NA  58.1  3.3700   7 222    18.4 393.36
## 307  0.07503  33.0  2.18    0 0.4720    NA  71.9  3.0992   7 222    18.4 396.90
## 308  0.04932  33.0  2.18    0 0.4720 6.849  70.3  3.1827   7 222    18.4     NA
## 309  0.49298   0.0  9.90    0 0.5440 6.635  82.5  3.3175   4 304    18.4 396.90
## 310  0.34940   0.0  9.90    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    NA  37.8  2.5194  NA 304    18.4 350.45
## 312  0.79041   0.0  9.90    0 0.5440 6.122  52.8  2.6403   4 304    18.4 396.90
## 313  0.26169   0.0    NA    0 0.5440 6.023  90.4  2.8340   4 304    18.4 396.30
## 314  0.26938    NA    NA   NA 0.5440 6.266  82.8      NA   4 304    18.4 393.39
## 315       NA   0.0  9.90    0 0.5440 6.567    NA  3.6023   4 304    18.4 395.69
## 316  0.25356   0.0  9.90    0 0.5440 5.705  77.7  3.9450  NA 304    18.4 396.42
## 317  0.31827   0.0  9.90    0 0.5440 5.914  83.2  3.9986   4 304    18.4 390.70
## 318  0.24522   0.0  9.90   NA 0.5440    NA  71.7  4.0317   4  NA    18.4     NA
## 319  0.40202   0.0  9.90    0 0.5440    NA  67.2  3.5325   4 304      NA 395.21
## 320  0.47547    NA  9.90    0     NA    NA  58.8      NA   4 304    18.4 396.23
## 321  0.16760   0.0  7.38    0 0.4930    NA  52.3  4.5404   5  NA      NA 396.90
## 322  0.18159   0.0  7.38    0     NA 6.376  54.3  4.5404   5 287    19.6 396.90
## 323  0.35114   0.0    NA    0 0.4930 6.041    NA  4.7211   5 287    19.6 396.90
## 324  0.28392   0.0  7.38   NA     NA 5.708  74.3  4.7211   5 287    19.6     NA
## 325       NA    NA  7.38    0 0.4930 6.415  40.1  4.7211   5 287    19.6 396.90
## 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 0.4930 6.312  28.9  5.4159   5 287    19.6 396.90
## 328  0.24103   0.0  7.38   NA 0.4930 6.083  43.7  5.4159   5  NA    19.6     NA
## 329  0.06617   0.0  3.24    0 0.4600 5.868  25.8  5.2146  NA 430      NA 382.44
## 330  0.06724   0.0  3.24    0 0.4600 6.333    NA  5.2146   4 430    16.9 375.21
## 331  0.04544   0.0  3.24    0 0.4600 6.144  32.2  5.8736   4 430    16.9     NA
## 332  0.05023  35.0  6.06    0 0.4379 5.706  28.4  6.6407   1 304    16.9 394.02
## 333  0.03466  35.0  6.06   NA     NA 6.031  23.3  6.6407   1 304    16.9 362.25
## 334  0.05083   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  NA      NA 396.90
## 337  0.03427   0.0  5.19    0 0.5150    NA  46.3      NA  NA 224    20.2 396.90
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## 338       NA   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  37.3  4.8122   5  NA    20.2 396.14
## 340       NA   0.0  5.19    0 0.5150 5.985  45.4  4.8122   5 224    20.2 396.90
## 341  0.06151   0.0  5.19    0 0.5150    NA  58.5  4.8122   5 224    20.2 396.90
## 342  0.01301  35.0  1.52    0     NA 7.241  49.3  7.0379   1  NA    15.5 394.74
## 343  0.02498   0.0  1.89    0 0.5180 6.540  59.7  6.2669   1 422    15.9 389.96
## 344       NA  55.0  3.78    0 0.4840 6.696    NA  5.7321   5 370    17.6 396.90
## 345       NA  55.0    NA    0 0.4840 6.874  28.1  6.4654   5 370    17.6 387.97
## 346  0.03113   0.0  4.39    0 0.4420 6.014  48.5  8.0136   3 352    18.8 385.64
## 347       NA   0.0  4.39    0 0.4420 5.898  52.3  8.0136   3 352    18.8 364.61
## 348  0.01870  85.0  4.15    0 0.4290 6.516  27.7  8.5353   4  NA    17.9 392.43
## 349  0.01501  80.0  2.01    0     NA 6.635  29.7  8.3440   4 280    17.0     NA
## 350  0.02899  40.0  1.25    0 0.4290 6.939  34.5      NA   1 335    19.7 389.85
## 351  0.06211  40.0  1.25    0 0.4290 6.490    NA  8.7921   1 335    19.7 396.90
## 352  0.07950  60.0  1.69    0 0.4110 6.579    NA 10.7103  NA 411    18.3 370.78
## 353  0.07244  60.0    NA    0 0.4110 5.884  18.5 10.7103   4 411    18.3 392.33
## 354  0.01709  90.0  2.02    0 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      NA   4 334    22.0 382.80
## 356  0.10659  80.0  1.91    0     NA 5.936  19.5 10.5857   4 334    22.0     NA
## 357  8.98296   0.0 18.10    1 0.7700 6.212  97.4  2.1222  24 666    20.2 377.73
## 358  3.84970   0.0 18.10    1 0.7700 6.395  91.0  2.5052  24 666    20.2 391.34
## 359  5.20177   0.0 18.10    1 0.7700 6.127  83.4  2.7227  24 666    20.2 395.43
## 360  4.26131   0.0 18.10    0 0.7700    NA  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      NA 374.56
## 362  3.83684   0.0 18.10    0 0.7700 6.251  91.1  2.2955  24 666    20.2 350.65
## 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    NA 18.10   NA 0.7700 5.803    NA  1.9047  24 666    20.2 353.04
## 365  3.47428    NA 18.10    1 0.7180    NA    NA  1.9047  NA 666    20.2 354.55
## 366  4.55587    NA    NA    0 0.7180 3.561  87.9  1.6132  24 666    20.2 354.70
## 367  3.69695    NA 18.10    0 0.7180 4.963  91.4  1.7523  NA  NA    20.2 316.03
## 368 13.52220   0.0 18.10    0 0.6310    NA 100.0  1.5106  24 666    20.2 131.42
## 369  4.89822   0.0    NA    0 0.6310 4.970    NA      NA  24 666    20.2 375.52
## 370  5.66998   0.0    NA    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 0.6310    NA 100.0  1.1691  24 666      NA 366.15
## 373  8.26725   0.0 18.10   NA 0.6680 5.875  89.6  1.1296  24 666    20.2 347.88
## 374 11.10810   0.0 18.10    0 0.6680 4.906 100.0  1.1742  24 666    20.2 396.90
## 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     NA    NA  97.9  1.3163  24 666    20.2 396.90
## 377 15.28800   0.0 18.10    0 0.6710 6.649  93.3      NA  NA 666    20.2 363.02
## 378  9.82349   0.0 18.10   NA 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    20.2 396.90
## 380 17.86670   0.0 18.10    0 0.6710 6.223 100.0  1.3861  24  NA    20.2     NA
## 381 88.97620   0.0 18.10   NA 0.6710 6.968  91.9  1.4165  24 666    20.2     NA
## 382 15.87440   0.0 18.10    0 0.6710 6.545  99.1  1.5192  NA 666    20.2 396.90
## 383  9.18702   0.0 18.10    0 0.7000 5.536 100.0  1.5804  24 666    20.2 396.90
## 384  7.99248   0.0 18.10    0 0.7000 5.520    NA  1.5331  24 666    20.2     NA
## 385 20.08490   0.0 18.10    0     NA 4.368  91.2  1.4395  24 666    20.2 285.83
## 386 16.81180   0.0 18.10    0 0.7000    NA  98.1      NA  24 666    20.2 396.90
## 387 24.39380    NA 18.10    0 0.7000 4.652 100.0  1.4672  24 666    20.2 396.90
## 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 18.10    0 0.7000 4.880 100.0  1.5895  24 666    20.2 372.92
## 390  8.15174   0.0 18.10    0 0.7000 5.390  98.9  1.7281  24  NA    20.2     NA
## 391  6.96215    NA 18.10    0 0.7000 5.713  97.0  1.9265  24 666    20.2 394.43
```

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## 392  5.29305   0.0 18.10    0 0.7000 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    20.2 396.90
## 394  8.64476   0.0 18.10   NA 0.6930 6.193  92.6  1.7912  24 666      NA 396.90
## 395       NA   0.0 18.10    0 0.6930 5.887  94.7      NA  24 666    20.2 396.90
## 396  8.71675   0.0 18.10    0 0.6930 6.471  98.8  1.7257  24 666    20.2 391.98
## 397  5.87205   0.0 18.10    0 0.6930 6.405  96.0  1.6768  24 666    20.2 396.90
## 398  7.67202   0.0 18.10   NA 0.6930 5.747  98.9  1.6334  24  NA    20.2 393.10
## 399 38.35180    NA 18.10    0 0.6930 5.453 100.0  1.4896  24  NA    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       NA   0.0 18.10    0 0.6930 5.987 100.0  1.5888  24 666      NA 396.90
## 402 14.23620    NA 18.10    0 0.6930 6.343 100.0  1.5741  24 666    20.2 396.90
## 403  9.59571   0.0    NA    0 0.6930 6.404 100.0  1.6390  NA 666    20.2 376.11
## 404       NA   0.0 18.10    0 0.6930 5.349  96.0  1.7028  24 666    20.2 396.90
## 405 41.52920   0.0 18.10    0 0.6930 5.531  85.4  1.6074  24 666    20.2 329.46
## 406 67.92080   0.0 18.10    0 0.6930 5.683 100.0  1.4254  24 666    20.2 384.97
## 407       NA   0.0 18.10    0 0.6590 4.138 100.0  1.1781  24 666    20.2 370.22
## 408 11.95110   0.0 18.10    0 0.6590 5.608 100.0  1.2852  24 666      NA 332.09
## 409  7.40389   0.0 18.10    0 0.5970 5.617  97.9  1.4547  24 666    20.2 314.64
## 410 14.43830   0.0 18.10    0 0.5970 6.852 100.0  1.4655  24 666    20.2 179.36
## 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    NA 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     NA 4.628 100.0  1.5539  24  NA    20.2  28.79
## 414 28.65580   0.0 18.10    0 0.5970    NA    NA  1.5894  24 666    20.2 210.97
## 415 45.74610   0.0 18.10    0 0.6930    NA    NA  1.6582  24 666    20.2  88.27
## 416 18.08460   0.0 18.10   NA 0.6790    NA 100.0  1.8347  24 666      NA     NA
## 417       NA   0.0 18.10    0 0.6790 6.782  90.8  1.8195  24 666      NA  21.57
## 418 25.94060   0.0 18.10   NA 0.6790 5.304  89.1  1.6475  24 666    20.2 127.36
## 419       NA   0.0 18.10    0 0.6790 5.957 100.0  1.8026  24 666    20.2  16.45
## 420 11.81230   0.0 18.10   NA 0.7180 6.824  76.5  1.7940  24 666    20.2  48.45
## 421 11.08740   0.0 18.10    0 0.7180 6.411 100.0  1.8589  NA 666      NA 318.75
## 422  7.02259   0.0 18.10    0 0.7180 6.006    NA  1.8746  24 666    20.2 319.98
## 423 12.04820   0.0    NA    0 0.6140 5.648  87.6      NA  24 666      NA 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  8.79212   0.0 18.10    0 0.5840 5.565  70.6  2.0635  NA 666      NA   3.65
## 426 15.86030   0.0 18.10    0 0.6790 5.896  95.4  1.9096  NA 666      NA   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 0.6790 6.202  78.7  1.8629  24 666    20.2  18.82
## 429  7.36711   0.0 18.10    0 0.6790 6.193  78.1  1.9356  24 666    20.2  96.73
## 430  9.33889   0.0 18.10    0 0.6790 6.380    NA  1.9682  24 666    20.2     NA
## 431  8.49213    NA 18.10    0 0.5840 6.348  86.1  2.0527  24 666      NA  83.45
## 432 10.06230   0.0 18.10    0 0.5840 6.833  94.3  2.0882  NA 666    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    NA    0 0.7130 6.208    NA  2.2222  NA 666    20.2 100.63
## 436 11.16040    NA 18.10    0 0.7400 6.629  94.6  2.1247  24 666    20.2 109.85
## 437 14.42080   0.0 18.10    0     NA 6.461  93.3  2.0026  24 666    20.2     NA
## 438 15.17720   0.0    NA    0 0.7400 6.152 100.0  1.9142  24 666      NA   9.32
## 439 13.67810    NA 18.10    0 0.7400 5.935  87.9  1.8206  24 666      NA  68.95
## 440  9.39063   0.0 18.10    0 0.7400 5.627  93.9  1.8172  24 666    20.2 396.90
## 441       NA    NA 18.10    0 0.7400 5.818  92.4  1.8662  24  NA    20.2     NA
## 442  9.72418   0.0 18.10    0 0.7400 6.406    NA  2.0651  NA 666    20.2 385.96
## 443       NA   0.0 18.10    0 0.7400 6.219 100.0  2.0048  24 666    20.2 395.69
## 444  9.96654   0.0 18.10    0 0.7400 6.485 100.0  1.9784  24 666    20.2 386.73
## 445 12.80230   0.0 18.10   NA 0.7400 5.854  96.6  1.8956  24 666    20.2 240.52
```

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## 446 10.67180   0.0    NA    0 0.7400 6.459  94.8  1.9879  24  NA    20.2  43.06
## 447  6.28807   0.0    NA    0 0.7400 6.341  96.4  2.0720  24 666    20.2 318.01
## 448  9.92485   0.0 18.10    0 0.7400 6.251  96.6  2.1980  24 666    20.2     NA
## 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   NA 0.7130 6.417  98.3  2.1850  24 666    20.2 304.21
## 451  6.71772   0.0    NA   NA 0.7130 6.749  92.6  2.3236  24 666      NA     NA
## 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     NA 6.297  91.8  2.3682  NA 666    20.2 385.09
## 454  8.24809   0.0 18.10    0 0.7130 7.393  99.3  2.4527  24 666    20.2 375.87
## 455  9.51363   0.0 18.10    0 0.7130 6.728  94.1  2.4961  24  NA    20.2   6.68
## 456  4.75237   0.0 18.10    0     NA 6.525  86.5  2.4358  24 666    20.2  50.92
## 457  4.66883   0.0 18.10    0 0.7130 5.976  87.9  2.5806  24 666    20.2  10.48
## 458  8.20058   0.0 18.10    0 0.7130 5.936    NA  2.7792  24  NA    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   0.0    NA   NA 0.7130    NA  84.4  2.7175  24  NA    20.2 396.90
## 461  4.81213   0.0 18.10    0 0.7130 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 18.10    0 0.7130 6.317    NA  2.7344  24 666    20.2 396.90
## 464  5.82115   0.0 18.10    0 0.7130 6.513  89.9  2.8016  NA 666      NA     NA
## 465  7.83932   0.0 18.10    0 0.6550 6.209    NA  2.9634  24 666    20.2 396.90
## 466  3.16360   0.0 18.10    0 0.6550 5.759  48.2  3.0665  24 666    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 18.10    0 0.5840 6.003    NA  2.5403  24 666      NA 331.29
## 469 15.57570   0.0 18.10    0 0.5800 5.926  71.0  2.9084  24  NA    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    NA 18.10    0 0.5800 6.167  84.0  3.0334  24 666    20.2 396.90
## 472  4.03841   0.0 18.10    0 0.5320 6.229  90.7  3.0993  24 666    20.2 395.33
## 473  3.56868    NA 18.10    0 0.5800 6.437  75.0  2.8965  24 666    20.2 393.37
## 474  4.64689    NA    NA    0 0.6140 6.980  67.6  2.5329  24 666    20.2     NA
## 475  8.05579   0.0 18.10    0 0.5840 5.427  95.4  2.4298  24 666    20.2 352.58
## 476  6.39312    NA 18.10   NA     NA 6.162  97.4  2.2060  NA  NA    20.2 302.76
## 477  4.87141   0.0 18.10    0 0.6140 6.484  93.6  2.3053  24 666    20.2 396.21
## 478 15.02340   0.0    NA    0 0.6140    NA  97.3  2.1007  24 666    20.2 349.48
## 479 10.23300    NA 18.10    0 0.6140 6.185    NA  2.1705  NA 666    20.2 379.70
## 480 14.33370   0.0 18.10    0 0.6140 6.229  88.0  1.9512  24 666    20.2 383.32
## 481  5.82401   0.0 18.10    0     NA 6.242  64.7  3.4242  24 666    20.2 396.90
## 482  5.70818   0.0 18.10    0     NA    NA  74.9  3.3317  24 666    20.2 393.07
## 483  5.73116   0.0 18.10    0 0.5320    NA  77.0  3.4106  24 666    20.2 395.28
## 484  2.81838   0.0 18.10   NA 0.5320 5.762  40.3  4.0983  24 666    20.2 392.92
## 485  2.37857   0.0 18.10    0 0.5830 5.871  41.9     NA  24 666    20.2 370.73
## 486  3.67367   0.0 18.10    0 0.5830 6.312  51.9  3.9917  24 666    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 0.5830 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  NA  NA    20.1 395.09
## 490       NA   0.0 27.74    0 0.6090 5.414  98.3  1.7554   4 711    20.1 344.05
## 491  0.20746   0.0    NA    0 0.6090 5.093  98.0  1.8226   4 711    20.1 318.43
## 492  0.10574   0.0 27.74    0 0.6090 5.983  98.8  1.8681   4 711    20.1 390.11
## 493  0.11132   0.0 27.74   NA 0.6090 5.983  83.5  2.1099   4 711    20.1 396.90
## 494  0.17331   0.0    NA    0 0.5850 5.707  54.0  2.3817   6 391    19.2 396.90
## 495  0.27957   0.0  9.69    0 0.5850 5.926  42.6  2.3817   6 391    19.2 396.90
## 496  0.17899   0.0  9.69    0 0.5850 5.670  28.8  2.7986   6 391    19.2     NA
## 497  0.28960   0.0  9.69    0 0.5850 5.390  72.9  2.7986   6 391      NA     NA
## 498  0.26838   0.0  9.69    0 0.5850 5.794  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     NA
```

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## 500       NA   0.0  9.69    0 0.5850 5.569  73.5  2.3999   6 391    19.2 395.77
## 501  0.22438   0.0  9.69   NA 0.5850 6.027  79.7  2.4982   6 391      NA 396.90
## 502  0.06263    NA 11.93    0 0.5730 6.593  69.1  2.4786   1 273    21.0 391.99
## 503  0.04527   0.0 11.93    0 0.5730 6.120  76.7  2.2875  NA 273    21.0 396.90
## 504  0.06076   0.0    NA    0 0.5730 6.976  91.0  2.1675   1 273    21.0 396.90
## 505  0.10959   0.0 11.93    0 0.5730 6.794  89.3  2.3889   1 273    21.0 393.45
## 506  0.04741   0.0    NA    0 0.5730 6.030  80.8  2.5050   1 273    21.0 396.90
##     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  14.67
## 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     NA
## 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  30.81
## 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   7.54
## 75     NA
## 76   8.94
## 77  11.97
## 78  10.27
## 79  12.34
## 80   9.10
## 81   5.29
## 82   7.22
## 83   6.72
## 84   7.51
## 85   9.62
## 86   6.53
## 87  12.86
## 88   8.44
## 89   5.50
## 90   5.70
## 91   8.81
## 92     NA
## 93   8.16
## 94   6.21
## 95  10.59
## 96   6.65
## 97  11.34
## 98   4.21
## 99   3.57
## 100  6.19
```

```
## 101  9.42
## 102  7.67
## 103    NA
## 104 13.44
## 105 12.33
## 106 16.47
## 107 18.66
## 108 14.09
## 109 12.27
## 110    NA
## 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    NA
## 120    NA
## 121 14.37
## 122 14.27
## 123 17.93
## 124 25.41
## 125 17.58
## 126 14.81
## 127 27.26
## 128 17.19
## 129 15.39
## 130 18.34
## 131 12.60
## 132 12.26
## 133    NA
## 134 15.03
## 135 17.31
## 136 16.96
## 137 16.90
## 138 14.59
## 139    NA
## 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 15.79
```

```
## 155 15.12
## 156 15.02
## 157 16.14
## 158  4.59
## 159  6.43
## 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  4.82
## 184  5.68
## 185 13.98
## 186 13.15
## 187    NA
## 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  2.88
## 206 10.87
## 207 10.97
## 208 18.06
```

```
## 209 14.66
## 210 23.09
## 211    NA
## 212 23.98
## 213 16.03
## 214  9.38
## 215 29.55
## 216  9.47
## 217    NA
## 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 18.46
## 247  9.16
## 248 10.15
## 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    NA
```

```
## 263  5.91
## 264 11.25
## 265  8.10
## 266 10.45
## 267 14.79
## 268  7.44
## 269  3.16
## 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  3.01
## 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  6.93
## 306  8.93
## 307  6.47
## 308  7.53
## 309  4.54
## 310  9.97
## 311 12.64
## 312    NA
## 313    NA
## 314  7.90
## 315    NA
## 316    NA
```

```
## 317 18.33
## 318 15.94
## 319 10.36
## 320 12.73
## 321    NA
## 322    NA
## 323  7.70
## 324 11.74
## 325  6.12
## 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    NA
## 347 12.67
## 348  6.36
## 349  5.99
## 350  5.89
## 351  5.98
## 352  5.49
## 353  7.79
## 354    NA
## 355  8.05
## 356  5.57
## 357 17.60
## 358 13.27
## 359    NA
## 360 12.67
## 361  7.79
## 362 14.19
## 363 10.19
## 364 14.64
## 365  5.29
## 366    NA
## 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    NA
## 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    NA
## 392    NA
## 393    NA
## 394 15.17
## 395 16.35
## 396 17.12
## 397 19.37
## 398 19.92
## 399 30.59
## 400 29.97
## 401 26.77
## 402 20.32
## 403 20.31
## 404 19.77
## 405 27.38
## 406 22.98
## 407 23.34
## 408 12.13
## 409 26.40
## 410 19.78
## 411 10.11
## 412 21.22
## 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 16.22
## 435 15.17
## 436 23.27
## 437 18.05
## 438 26.45
## 439    NA
## 440 22.88
## 441 22.11
## 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 19.31
## 451 17.44
## 452    NA
## 453 17.27
## 454 16.74
## 455 18.71
## 456 18.13
## 457 19.01
## 458 16.94
## 459    NA
## 460 14.70
## 461 16.42
## 462 14.65
## 463 13.99
## 464 10.29
## 465 13.22
## 466 14.13
## 467 17.15
## 468 21.32
## 469 18.13
## 470 14.76
## 471 16.29
## 472 12.87
## 473 14.36
## 474 11.66
## 475 18.14
## 476 24.10
## 477 18.68
## 478    NA
```

```
## 479 18.03
## 480 13.11
## 481 10.74
## 482    NA
## 483  7.01
## 484 10.42
## 485 13.34
## 486 10.58
## 487    NA
## 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    NA
## 499 12.92
## 500    NA
## 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(randomForest)
library(tidyr)

X = Boston
X = data.frame(punch_holes(0.1, X))
```

```
## Warning in matrix(nrow = n, ncol = p, sample(c(rep(0, n * p * (1 -
## prob_missing)), : data length [7083] is not a sub-multiple or multiple of the
## number of rows [506]
```

```
n = nrow(X)
p = ncol(X)

for(i in 1:n) {
  for (j in 1: p) {
    if(is.na(X[i,j])){
    X_naive = X %>%
      replace_na(as.list(colMeans(X, na.rm = TRUE)))


  rf_mod = randomForest(X_naive[,j] ~., data = X_naive, ntree = 100)
  X[i,j] = predict(rf_mod, X_naive[i,])
```

```
  }
 }
}
```

```
## Warning in randomForest.default(m, y, ...): The response has five or fewer
## unique values. Are you sure you want to do regression?
```

```
## Warning in randomForest.default(m, y, ...): The response has five or fewer
## unique values. Are you sure you want to do regression?
```

```
## Warning in randomForest.default(m, y, ...): The response has five or fewer
## unique values. Are you sure you want to do regression?
```

```
X
```

```
##          crim        zn     indus       chas       nox       rm       age
## 1    0.006320  18.00000 10.378103 0.00000000 0.5380000 6.575000  65.20000
## 2    0.027310   0.00000  7.070000 0.00000000 0.4690000 6.421000  78.90000
## 3    0.027290  12.27722  7.070000 0.00000000 0.4690000 7.185000  61.10000
## 4    0.032370   0.00000  2.180000 0.00000000 0.5437600 6.998000  45.80000
## 5    0.069050   0.00000  2.180000 0.00000000 0.4580000 7.147000  54.20000
## 6    0.029850  12.90486  2.180000 0.00000000 0.4580000 6.430000  58.70000
## 7    0.088290  12.50000  7.870000 0.00000000 0.5240000 6.012000  66.79484
## 8    0.144550  11.52758  7.870000 0.00000000 0.5240000 6.172000  96.10000
## 9    0.211240  12.50000  7.870000 0.00000000 0.5240000 5.631000 100.00000
## 10   0.170040  12.50000  7.870000 0.00000000 0.5240000 6.004000  85.90000
## 11   3.571683  12.50000  7.870000 0.00000000 0.5240000 6.377000  94.30000
## 12   0.117470  12.50000  7.870000 0.00000000 0.5240000 6.009000  82.90000
## 13   0.093780  12.50000  7.870000 0.00000000 0.5240000 5.889000  39.00000
## 14   0.629760   0.00000  8.140000 0.00000000 0.5380000 5.949000  66.60586
## 15   0.637960  11.01039  8.140000 0.00000000 0.5380000 6.096000  84.50000
## 16   0.627390   0.00000  8.140000 0.00000000 0.5380000 5.834000  56.50000
## 17   1.053930   0.00000  8.140000 0.00000000 0.5503795 5.935000  29.30000
## 18   0.784200   0.00000  8.140000 0.00000000 0.5380000 5.990000  70.15692
## 19   3.628141   0.00000  8.140000 0.00000000 0.5380000 6.270489  36.60000
## 20   0.725800   0.00000  8.140000 0.05785202 0.5380000 5.727000  69.50000
## 21   1.251790   0.00000  8.140000 0.00000000 0.5380000 5.570000  98.10000
## 22   0.852040  11.44496  8.140000 0.00000000 0.5380000 5.965000  89.20000
## 23   1.232470   0.00000  8.140000 0.00000000 0.5380000 6.263725  91.70000
## 24   0.988430   0.00000  8.140000 0.00000000 0.5380000 5.813000 100.00000
## 25   0.750260   0.00000 10.712575 0.00000000 0.5380000 5.924000  94.10000
## 26   0.840540   0.00000  8.140000 0.00000000 0.5380000 5.599000  85.70000
## 27   0.671910   0.00000  8.140000 0.05649412 0.5380000 5.813000  90.30000
## 28   0.955770   0.00000  8.140000 0.00000000 0.5380000 6.047000  88.80000
## 29   3.690766   0.00000  8.140000 0.00000000 0.5534955 6.495000  94.40000
## 30   3.703743   0.00000  8.140000 0.06096464 0.5380000 6.674000  87.30000
## 31   1.130810   0.00000  8.140000 0.00000000 0.5380000 5.713000  94.10000
## 32   3.554763  11.13316  8.140000 0.00000000 0.5380000 6.072000 100.00000
## 33   1.387990   0.00000  8.140000 0.06087581 0.5572200 5.950000  82.00000
## 34   1.151720   0.00000 10.885705 0.00000000 0.5380000 5.701000  95.00000
## 35   1.612820   0.00000  8.140000 0.00000000 0.5593948 6.096000  70.50587
## 36   0.064170   0.00000  5.960000 0.00000000 0.4990000 5.933000  68.20000
## 37   0.097440   0.00000  5.960000 0.00000000 0.4990000 5.841000  61.40000
## 38   0.080140   0.00000  5.960000 0.05776157 0.4990000 5.850000  41.50000
## 39   0.175050  11.45542  5.960000 0.00000000 0.4990000 5.966000  30.20000
```

```
## 40   0.027630  75.00000  2.950000 0.00000000 0.4280000 6.595000  21.80000
## 41   0.033590  75.00000  2.950000 0.00000000 0.4280000 7.024000  15.80000
## 42   0.127440   0.00000  6.910000 0.05875423 0.4480000 6.770000   2.90000
## 43   0.141500   0.00000  6.910000 0.00000000 0.4480000 6.169000  65.27666
## 44   0.159360   0.00000  6.910000 0.00000000 0.4480000 6.211000  65.48647
## 45   0.122690   0.00000  6.910000 0.00000000 0.4480000 6.069000  40.00000
## 46   0.171420   0.00000  6.910000 0.00000000 0.4480000 5.682000  33.80000
## 47   0.188360   0.00000  6.910000 0.00000000 0.4480000 5.786000  33.30000
## 48   0.229270   0.00000  6.910000 0.00000000 0.5507104 6.030000  85.50000
## 49   0.253870   0.00000  6.910000 0.00000000 0.4480000 5.399000  95.30000
## 50   0.219770   0.00000  6.910000 0.00000000 0.4480000 5.602000  62.00000
## 51   0.088730  21.00000  5.640000 0.00000000 0.4390000 5.963000  45.70000
## 52   3.694102  21.00000  5.640000 0.00000000 0.4390000 6.115000  63.00000
## 53   0.053600  21.00000  5.640000 0.00000000 0.4390000 6.511000  21.10000
## 54   0.049810  21.00000  5.640000 0.00000000 0.4390000 5.998000  21.40000
## 55   3.556837  14.13453  4.000000 0.00000000 0.4100000 5.888000  47.60000
## 56   0.013110  90.00000  1.220000 0.00000000 0.5433388 7.249000  21.90000
## 57   0.020550  85.00000  0.740000 0.00000000 0.5428135 6.383000  35.70000
## 58   0.014320 100.00000  1.320000 0.00000000 0.4110000 6.816000  40.50000
## 59   0.154450  25.00000  5.130000 0.05788111 0.4530000 6.145000  29.20000
## 60   0.103280  25.00000  5.130000 0.00000000 0.4530000 5.927000  67.35975
## 61   0.149320  13.35320  5.130000 0.00000000 0.5518025 5.741000  66.20000
## 62   0.171710  12.26646  5.130000 0.00000000 0.4530000 5.966000  93.40000
## 63   0.110270  25.00000  5.130000 0.00000000 0.4530000 6.456000  67.80000
## 64   0.126500  25.00000  5.130000 0.00000000 0.4530000 6.307177  43.40000
## 65   0.019510  17.50000  1.380000 0.00000000 0.4161000 7.104000  63.93459
## 66   0.035840  80.00000  3.370000 0.06503655 0.3980000 6.290000  17.80000
## 67   0.043790  80.00000  3.370000 0.00000000 0.3980000 5.787000  31.10000
## 68   0.057890  12.50000  6.070000 0.00000000 0.4090000 5.878000  21.40000
## 69   0.135540  13.55176  6.070000 0.00000000 0.4090000 5.594000  36.80000
## 70   3.637536  12.50000 10.775735 0.00000000 0.4090000 5.885000  33.00000
## 71   0.088260   0.00000 10.810000 0.00000000 0.4130000 6.417000  65.22148
## 72   0.158760   0.00000 10.898187 0.00000000 0.4130000 5.961000  17.50000
## 73   0.091640   0.00000 10.810000 0.00000000 0.4130000 6.065000   7.80000
## 74   0.195390   0.00000 10.810000 0.00000000 0.4130000 6.278294   6.20000
## 75   0.078960   0.00000 12.830000 0.00000000 0.4370000 6.273000   6.00000
## 76   0.095120   0.00000 12.830000 0.00000000 0.4370000 6.286000  45.00000
## 77   3.763468   0.00000 12.830000 0.00000000 0.4370000 6.273133  74.50000
## 78   0.087070   0.00000 12.830000 0.00000000 0.4370000 6.140000  45.80000
## 79   3.692085   0.00000 12.830000 0.00000000 0.4370000 6.232000  53.70000
## 80   0.083870   0.00000 12.830000 0.00000000 0.4370000 5.874000  36.60000
## 81   0.041130  25.00000  4.860000 0.00000000 0.4260000 6.727000  33.50000
## 82   0.044620  25.00000  4.860000 0.05677614 0.4260000 6.619000  64.16388
## 83   0.036590  25.00000  4.860000 0.00000000 0.4260000 6.302000  32.20000
## 84   0.035510  12.97356  4.860000 0.00000000 0.4260000 6.167000  46.70000
## 85   0.050590   0.00000  4.490000 0.00000000 0.4490000 6.389000  48.00000
## 86   0.057350   0.00000  4.490000 0.00000000 0.4490000 6.630000  56.10000
## 87   0.051880   0.00000  4.490000 0.00000000 0.4490000 6.263530  45.10000
## 88   0.071510   0.00000  4.490000 0.00000000 0.4490000 6.121000  56.80000
## 89   0.056600  11.42600  3.410000 0.00000000 0.4890000 7.007000  86.30000
## 90   0.053020   0.00000  3.410000 0.00000000 0.4890000 7.079000  63.10000
## 91   0.046840   0.00000 10.885908 0.00000000 0.4890000 6.417000  66.10000
## 92   3.763559   0.00000  3.410000 0.00000000 0.4890000 6.405000  73.90000
## 93   0.042030  28.00000 15.040000 0.00000000 0.4640000 6.442000  53.60000
```

```
## 94   0.028750  28.00000 15.040000 0.00000000 0.4640000 6.211000  28.90000
## 95   0.042940  12.93233 15.040000 0.00000000 0.4640000 6.249000  77.30000
## 96   0.122040   0.00000  2.890000 0.05979632 0.4450000 6.625000  57.80000
## 97   0.115040   0.00000 10.985415 0.00000000 0.4450000 6.163000  69.60000
## 98   0.120830   0.00000  2.890000 0.00000000 0.4450000 8.069000  76.00000
## 99   0.081870   0.00000  2.890000 0.05763497 0.4450000 7.820000  36.90000
## 100  0.068600   0.00000  2.890000 0.00000000 0.4450000 7.416000  62.50000
## 101  0.148660  11.64013  8.560000 0.00000000 0.5200000 6.727000  69.30112
## 102  0.114320   0.00000  8.560000 0.00000000 0.5200000 6.781000  71.30000
## 103  0.228760   0.00000  8.560000 0.05858234 0.5200000 6.405000  85.40000
## 104  0.211610   0.00000  8.560000 0.00000000 0.5200000 6.137000  68.54102
## 105  3.475152  11.38444  8.560000 0.00000000 0.5200000 6.167000  90.00000
## 106  0.132620   0.00000  8.560000 0.00000000 0.5200000 5.851000  96.70000
## 107  0.171200   0.00000  8.560000 0.00000000 0.5200000 5.836000  91.90000
## 108  0.131170   0.00000  8.560000 0.00000000 0.5200000 6.268322  85.20000
## 109  0.128020   0.00000  8.560000 0.00000000 0.5200000 6.474000  97.10000
## 110  0.263630   0.00000  8.560000 0.00000000 0.5521443 6.229000  91.20000
## 111  0.107930  11.59306  8.560000 0.00000000 0.5200000 6.195000  54.40000
## 112  0.100840   0.00000 10.010000 0.00000000 0.5470000 6.715000  81.60000
## 113  0.123290   0.00000 10.010000 0.00000000 0.5470000 5.913000  92.90000
## 114  0.222120   0.00000 10.010000 0.00000000 0.5470000 6.092000  95.40000
## 115  0.142310   0.00000 10.010000 0.00000000 0.5470000 6.254000  84.20000
## 116  0.171340   0.00000 10.010000 0.00000000 0.5470000 5.928000  88.20000
## 117  0.131580   0.00000 10.010000 0.00000000 0.5470000 6.176000  72.50000
## 118  0.150980   0.00000 10.010000 0.00000000 0.5470000 6.021000  82.60000
## 119  0.130580  11.43628 10.010000 0.00000000 0.5470000 5.872000  73.10000
## 120  0.144760   0.00000 10.010000 0.00000000 0.5470000 5.731000  65.20000
## 121  0.068990   0.00000 25.650000 0.00000000 0.5810000 5.870000  69.70000
## 122  0.071650   0.00000 25.650000 0.00000000 0.5810000 6.004000  84.10000
## 123  0.092990   0.00000 25.650000 0.05092370 0.5810000 6.271103  69.17469
## 124  3.461909  11.24879 25.650000 0.00000000 0.5810000 5.856000  97.00000
## 125  3.553288   0.00000 25.650000 0.05741132 0.5810000 5.879000  95.80000
## 126  0.169020  11.66700 25.650000 0.00000000 0.5810000 5.986000  88.40000
## 127  0.387350   0.00000 25.650000 0.00000000 0.5810000 5.613000  69.59513
## 128  3.507677  11.28029 21.890000 0.00000000 0.6240000 5.693000  96.00000
## 129  0.325430  11.17175 12.259890 0.00000000 0.6240000 6.431000  98.80000
## 130  0.881250  11.11498 21.890000 0.00000000 0.6240000 5.637000  69.41659
## 131  0.340060   0.00000 21.890000 0.00000000 0.6240000 6.458000  98.90000
## 132  3.520144   0.00000 21.890000 0.00000000 0.6240000 6.326000  70.34375
## 133  3.485581   0.00000 21.890000 0.00000000 0.6240000 6.372000  97.90000
## 134  3.624998   0.00000 21.890000 0.00000000 0.6240000 5.822000  95.40000
## 135  0.976170   0.00000 21.890000 0.00000000 0.6240000 5.757000  69.96829
## 136  3.640775   0.00000 11.338667 0.00000000 0.6240000 6.335000  98.20000
## 137  0.322640   0.00000 21.890000 0.00000000 0.6240000 5.942000  93.50000
## 138  0.352330   0.00000 21.890000 0.00000000 0.6240000 6.284069  70.48981
## 139  3.787340   0.00000 12.235521 0.00000000 0.6240000 5.857000  70.19485
## 140  0.544520  10.79283 21.890000 0.00000000 0.6240000 6.151000  97.90000
## 141  0.290900   0.00000 21.890000 0.00000000 0.6240000 6.174000  93.60000
## 142  4.013597   0.00000 21.890000 0.00000000 0.6240000 5.019000 100.00000
## 143  3.321050  11.06879 19.580000 1.00000000 0.8710000 5.403000 100.00000
## 144  4.097400   0.00000 19.580000 0.08856662 0.8710000 5.468000 100.00000
## 145  2.779740   0.00000 19.580000 0.00000000 0.8710000 4.903000  97.80000
## 146  4.043861   0.00000 19.580000 0.07347739 0.8710000 6.136399 100.00000
## 147  2.155050  11.14796 19.580000 0.00000000 0.8710000 5.628000 100.00000
```

```
## 148  2.368620   0.00000 19.580000 0.00000000 0.8710000 4.926000  95.70000
## 149  2.330990   0.00000 19.580000 0.00000000 0.8710000 5.186000  93.80000
## 150  2.733970   0.00000 19.580000 0.00000000 0.8710000 5.597000  94.90000
## 151  1.656600   0.00000 19.580000 0.00000000 0.8710000 6.122000  97.30000
## 152  1.496320   0.00000 19.580000 0.00000000 0.8710000 5.404000 100.00000
## 153  1.126580   0.00000 19.580000 1.00000000 0.8710000 5.012000  88.00000
## 154  2.149180   0.00000 19.580000 0.00000000 0.8710000 5.709000  98.50000
## 155  1.413850  10.87994 11.185216 1.00000000 0.8710000 6.129000  96.00000
## 156  3.535010   0.00000 11.467708 1.00000000 0.8710000 6.152000  82.60000
## 157  3.704846   0.00000 19.580000 0.00000000 0.8710000 6.207904  94.00000
## 158  1.223580   0.00000 19.580000 0.00000000 0.6050000 6.943000  97.40000
## 159  1.342840   0.00000 19.580000 0.00000000 0.6050000 6.066000 100.00000
## 160  1.425020   0.00000 19.580000 0.00000000 0.8710000 6.510000 100.00000
## 161  1.273460   0.00000 19.580000 1.00000000 0.5723314 6.250000  92.60000
## 162  1.463360   0.00000 19.580000 0.00000000 0.6050000 7.489000  90.80000
## 163  1.833770   0.00000 19.580000 0.08197398 0.6050000 7.802000  98.20000
## 164  1.519020   0.00000 19.580000 1.00000000 0.6050000 8.375000  93.90000
## 165  2.242360   0.00000 19.580000 0.00000000 0.6050000 5.854000  69.41789
## 166  2.924000   0.00000 19.580000 0.00000000 0.5617279 6.101000  93.00000
## 167  3.557412   0.00000 11.054457 0.00000000 0.6050000 7.929000  96.20000
## 168  1.800280   0.00000 19.580000 0.00000000 0.5617264 5.877000  79.20000
## 169  2.300400   0.00000 19.580000 0.00000000 0.6050000 6.274214  96.10000
## 170  2.449530   0.00000 19.580000 0.06339807 0.6050000 6.402000  95.20000
## 171  1.207420  11.22344 19.580000 0.00000000 0.6050000 5.875000  70.12407
## 172  3.457871   0.00000 19.580000 0.06592257 0.6050000 5.880000  97.30000
## 173  0.139140   0.00000  4.050000 0.00000000 0.5100000 5.572000  88.50000
## 174  0.091780   0.00000  4.050000 0.00000000 0.5100000 6.265382  84.10000
## 175  0.084470  11.57714  4.050000 0.06419376 0.5100000 5.859000  68.70000
## 176  3.633127   0.00000  4.050000 0.06912767 0.5100000 6.546000  33.10000
## 177  0.070220   0.00000 10.884912 0.00000000 0.5100000 6.020000  47.20000
## 178  0.054250   0.00000  4.050000 0.06039057 0.5478678 6.315000  73.40000
## 179  0.066420   0.00000 10.462645 0.00000000 0.5100000 6.860000  74.40000
## 180  0.057800   0.00000 10.235570 0.00000000 0.4880000 6.980000  58.40000
## 181  0.065880   0.00000  2.460000 0.00000000 0.4880000 6.426410  83.30000
## 182  0.068880   0.00000 10.615674 0.00000000 0.4880000 6.144000  62.20000
## 183  0.091030   0.00000  2.460000 0.00000000 0.4880000 7.155000  92.20000
## 184  0.100080   0.00000  2.460000 0.00000000 0.4880000 6.563000  95.60000
## 185  0.083080   0.00000  2.460000 0.00000000 0.4880000 5.604000  89.80000
## 186  0.060470   0.00000 10.693685 0.00000000 0.4880000 6.153000  68.80000
## 187  0.056020   0.00000  2.460000 0.00000000 0.4880000 7.831000  67.63422
## 188  0.078750  45.00000  3.440000 0.00000000 0.4370000 6.782000  41.10000
## 189  0.125790  45.00000  3.440000 0.00000000 0.4370000 6.556000  29.10000
## 190  0.083700  45.00000  3.440000 0.00000000 0.4370000 7.185000  64.67363
## 191  3.646490  45.00000  3.440000 0.00000000 0.4370000 6.951000  21.50000
## 192  0.069110  45.00000  3.440000 0.05985334 0.4370000 6.739000  30.80000
## 193  0.086640  45.00000  3.440000 0.00000000 0.4370000 7.178000  26.30000
## 194  0.021870  60.00000  2.930000 0.06531207 0.4010000 6.800000   9.90000
## 195  0.014390  60.00000 10.541999 0.00000000 0.4010000 6.604000  18.80000
## 196  0.013810  80.00000  0.460000 0.00000000 0.4220000 7.875000  32.00000
## 197  0.040110  80.00000  1.520000 0.06168876 0.4040000 7.287000  34.10000
## 198  0.046660  80.00000 10.240760 0.00000000 0.4040000 7.107000  36.60000
## 199  3.513478  80.00000  1.520000 0.00000000 0.4040000 7.274000  38.30000
## 200  0.031500  95.00000  1.470000 0.00000000 0.5445365 6.975000  15.30000
## 201  0.017780  95.00000 10.310221 0.00000000 0.4030000 7.135000  13.90000
```

```
## 202  0.034450  82.50000  2.030000 0.00000000 0.4150000 6.162000  38.40000
## 203  3.599357  82.50000  2.030000 0.00000000 0.4150000 6.436990  15.70000
## 204  3.474456  95.00000  2.680000 0.00000000 0.5424278 7.853000  33.20000
## 205  0.020090  95.00000  2.680000 0.00000000 0.4161000 6.489376  31.90000
## 206  0.136420   0.00000 10.590000 0.00000000 0.4890000 5.891000  22.30000
## 207  0.229690   0.00000 10.590000 0.00000000 0.4890000 6.326000  52.50000
## 208  0.251990   0.00000 10.590000 0.00000000 0.4890000 5.783000  72.70000
## 209  0.135870   0.00000 10.590000 1.00000000 0.5464487 6.064000  59.10000
## 210  0.435710   0.00000 10.590000 1.00000000 0.4890000 5.344000  70.81426
## 211  0.174460   0.00000 10.590000 1.00000000 0.4890000 5.960000  92.10000
## 212  0.375780   0.00000 10.590000 1.00000000 0.4890000 5.404000  88.60000
## 213  0.217190  11.44544 10.590000 1.00000000 0.4890000 5.807000  53.80000
## 214  0.140520   0.00000 10.590000 0.00000000 0.4890000 6.375000  32.30000
## 215  0.289550   0.00000 10.590000 0.00000000 0.4890000 5.412000   9.80000
## 216  0.198020   0.00000 10.590000 0.00000000 0.4890000 6.182000  66.55240
## 217  0.045600   0.00000 13.890000 1.00000000 0.5500000 5.888000  56.00000
## 218  0.070130   0.00000 13.890000 0.00000000 0.5500000 6.642000  85.10000
## 219  0.110690   0.00000 13.890000 1.00000000 0.5587579 6.260891  93.80000
## 220  0.114250   0.00000 13.890000 0.05857463 0.5500000 6.373000  67.92670
## 221  0.358090   0.00000  6.200000 1.00000000 0.5070000 6.951000  88.50000
## 222  0.407710   0.00000  6.200000 1.00000000 0.5070000 6.164000  91.30000
## 223  3.593008   0.00000  6.200000 1.00000000 0.5070000 6.879000  77.70000
## 224  0.614700   0.00000  6.200000 0.00000000 0.5070000 6.618000  80.80000
## 225  0.315330   0.00000  6.200000 0.00000000 0.5040000 8.266000  78.30000
## 226  0.526930   0.00000  6.200000 0.06781597 0.5040000 8.725000  83.00000
## 227  3.660710   0.00000  6.200000 0.00000000 0.5040000 8.040000  86.50000
## 228  0.412380   0.00000  6.200000 0.00000000 0.5040000 7.163000  69.05419
## 229  0.298190   0.00000  6.200000 0.00000000 0.5040000 7.686000  17.00000
## 230  0.441780   0.00000  6.200000 0.00000000 0.5040000 6.552000  21.40000
## 231  0.537000   0.00000  6.200000 0.00000000 0.5040000 5.981000  68.10000
## 232  0.462960   0.00000  6.200000 0.00000000 0.5040000 7.412000  76.90000
## 233  0.575290   0.00000  6.200000 0.07883375 0.5070000 8.337000  73.30000
## 234  0.331470   0.00000  6.200000 0.06152159 0.5070000 8.247000  70.40000
## 235  0.447910   0.00000  6.200000 1.00000000 0.5070000 6.726000  66.50000
## 236  0.330450   0.00000  6.200000 0.00000000 0.5070000 6.086000  61.50000
## 237  0.520580  11.39615  6.200000 1.00000000 0.5070000 6.631000  76.50000
## 238  0.511830   0.00000  6.200000 0.00000000 0.5070000 7.358000  71.60000
## 239  0.082440  30.00000  4.930000 0.05813786 0.4280000 6.481000  18.50000
## 240  0.092520  13.28193  4.930000 0.00000000 0.4280000 6.606000  42.20000
## 241  0.113290  30.00000  4.930000 0.00000000 0.5499028 6.897000  54.30000
## 242  0.106120  30.00000  4.930000 0.00000000 0.5481377 6.095000  67.33054
## 243  0.102900  30.00000  4.930000 0.00000000 0.4280000 6.358000  65.41630
## 244  0.127570  30.00000  4.930000 0.05807661 0.4280000 6.393000   7.80000
## 245  0.206080  22.00000  5.860000 0.00000000 0.4310000 5.593000  68.86590
## 246  0.191330  22.00000 10.324825 0.00000000 0.4310000 5.605000  70.20000
## 247  0.339830  22.00000  5.860000 0.00000000 0.4310000 6.108000  34.90000
## 248  0.196570  22.00000  5.860000 0.00000000 0.4310000 6.226000  79.20000
## 249  3.491106  22.00000  5.860000 0.00000000 0.4310000 6.433000  49.10000
## 250  0.190730  22.00000  5.860000 0.00000000 0.4310000 6.718000  17.50000
## 251  0.140300  22.00000  5.860000 0.00000000 0.4310000 6.487000  13.00000
## 252  0.214090  22.00000  5.860000 0.00000000 0.4310000 6.438000   8.90000
## 253  0.082210  13.50359  5.860000 0.00000000 0.4310000 6.957000   6.80000
## 254  0.368940  22.00000  5.860000 0.00000000 0.4310000 8.259000   8.40000
## 255  0.048190  80.00000  3.640000 0.00000000 0.5340874 6.108000  32.00000
```

```
## 256  0.035480  80.00000  3.640000 0.00000000 0.3920000 5.876000  19.10000
## 257  0.015380  16.30973 10.446212 0.00000000 0.5467071 7.454000  34.20000
## 258  0.611540  20.00000  3.970000 0.00000000 0.6470000 8.704000  86.90000
## 259  0.663510  20.00000  3.970000 0.00000000 0.6470000 7.333000 100.00000
## 260  0.656650  20.00000  3.970000 0.00000000 0.6470000 6.842000 100.00000
## 261  3.402654  20.00000  3.970000 0.00000000 0.6470000 7.203000  81.80000
## 262  0.534120  12.81644  3.970000 0.00000000 0.6470000 7.520000  89.40000
## 263  0.520140  20.00000  9.627868 0.00000000 0.6470000 8.398000  91.50000
## 264  0.825260  20.00000  3.970000 0.00000000 0.6470000 7.327000  94.50000
## 265  3.502864  20.00000  3.970000 0.05717762 0.6470000 7.206000  91.60000
## 266  0.761620  20.00000  3.970000 0.06058143 0.6470000 5.560000  62.80000
## 267  0.785700  20.00000  3.970000 0.00000000 0.6470000 7.014000  70.03959
## 268  0.578340  20.00000  3.970000 0.06096635 0.5750000 8.297000  67.00000
## 269  0.540500  20.00000  3.970000 0.00000000 0.5537226 6.374122  52.60000
## 270  0.090650  20.00000  6.960000 1.00000000 0.4640000 5.920000  61.50000
## 271  0.299160  20.00000  6.960000 0.00000000 0.4640000 5.856000  42.10000
## 272  0.162110  20.00000  6.960000 0.00000000 0.4640000 6.240000  16.30000
## 273  3.627971  20.00000  6.960000 0.00000000 0.5529908 6.538000  58.70000
## 274  0.221880  20.00000  6.960000 1.00000000 0.4640000 7.691000  51.80000
## 275  0.056440  40.00000 10.220769 1.00000000 0.4470000 6.758000  32.90000
## 276  0.096040  13.86157  6.410000 0.00000000 0.4470000 6.399001  42.80000
## 277  0.104690  40.00000  6.410000 0.05976180 0.4470000 6.350322  49.00000
## 278  0.061270  40.00000  6.410000 0.06360355 0.4470000 6.826000  27.60000
## 279  0.079780  40.00000 10.575278 0.00000000 0.4470000 6.482000  32.10000
## 280  0.210380  20.00000  3.330000 0.05767588 0.4429000 6.812000  32.20000
## 281  0.035780  14.11896  3.330000 0.00000000 0.4429000 7.820000  64.50000
## 282  3.457562  20.00000  3.330000 0.06006832 0.4429000 6.405713  37.20000
## 283  0.061290  20.00000  3.330000 0.05950944 0.5515028 7.645000  49.70000
## 284  0.015010  90.00000  1.210000 1.00000000 0.4010000 7.923000  24.80000
## 285  0.009060  90.00000  9.904864 0.00000000 0.4000000 7.088000  20.80000
## 286  0.010960  55.00000  2.250000 0.00000000 0.5382066 6.453000  65.54662
## 287  0.019650  80.00000  1.760000 0.00000000 0.3850000 6.230000  31.50000
## 288  0.038710  52.50000  5.320000 0.00000000 0.4050000 6.209000  31.30000
## 289  0.045900  14.88059  5.320000 0.00000000 0.4050000 6.315000  45.60000
## 290  0.042970  52.50000  5.320000 0.00000000 0.4050000 6.565000  22.90000
## 291  0.035020  80.00000  4.950000 0.05872887 0.4110000 6.861000  27.90000
## 292  0.078860  80.00000  4.950000 0.00000000 0.4110000 7.148000  27.70000
## 293  0.036150  80.00000  4.950000 0.00000000 0.4110000 6.630000  23.40000
## 294  0.082650   0.00000 13.920000 0.00000000 0.4370000 6.127000  18.40000
## 295  0.081990   0.00000 13.920000 0.00000000 0.4370000 6.009000  42.30000
## 296  3.581661   0.00000 13.920000 0.00000000 0.5428315 6.678000  31.10000
## 297  0.053720   0.00000 13.920000 0.00000000 0.4370000 6.549000  51.00000
## 298  0.141030   0.00000 13.920000 0.00000000 0.4370000 5.790000  58.00000
## 299  0.064660  17.69714  2.240000 0.00000000 0.4000000 6.345000  20.10000
## 300  0.055610  23.11139  2.240000 0.00000000 0.4000000 7.041000  10.00000
## 301  3.624765  70.00000  2.240000 0.00000000 0.4000000 6.871000  47.40000
## 302  0.035370  14.59466  6.090000 0.00000000 0.4330000 6.590000  40.40000
## 303  0.092660  34.00000  6.090000 0.00000000 0.4330000 6.495000  18.40000
## 304  0.100000  34.00000  6.090000 0.00000000 0.4330000 6.982000  17.70000
## 305  0.055150  33.00000  2.180000 0.00000000 0.4720000 7.236000  41.10000
## 306  0.054790  33.00000  2.180000 0.00000000 0.4720000 6.616000  58.10000
## 307  0.075030  33.00000  2.180000 0.00000000 0.5460020 7.420000  71.90000
## 308  0.049320  33.00000  2.180000 0.00000000 0.4720000 6.849000  70.30000
## 309  0.492980  11.53659 10.479985 0.00000000 0.5440000 6.635000  82.50000
```

```
## 310  0.349400   0.00000  9.900000 0.05801930 0.5440000 5.972000  76.70000
## 311  2.635480   0.00000  9.900000 0.00000000 0.5440000 4.973000  37.80000
## 312  0.790410   0.00000 10.875048 0.00000000 0.5440000 6.122000  52.80000
## 313  0.261690   0.00000  9.900000 0.00000000 0.5440000 6.023000  90.40000
## 314  0.269380   0.00000  9.900000 0.00000000 0.5440000 6.266000  68.17547
## 315  3.569668   0.00000  9.900000 0.00000000 0.5440000 6.567000  87.30000
## 316  0.253560   0.00000  9.900000 0.00000000 0.5440000 5.705000  77.70000
## 317  0.318270   0.00000  9.900000 0.05767542 0.5534506 5.914000  83.20000
## 318  0.245220  11.22452  9.900000 0.00000000 0.5440000 5.782000  71.70000
## 319  0.402020   0.00000  9.900000 0.00000000 0.5440000 6.382000  67.20000
## 320  0.475470   0.00000 10.666573 0.00000000 0.5440000 6.265922  58.80000
## 321  0.167600   0.00000  7.380000 0.00000000 0.4930000 6.426000  52.30000
## 322  0.181590  10.72515  7.380000 0.00000000 0.4930000 6.376000  54.30000
## 323  0.351140   0.00000  7.380000 0.00000000 0.4930000 6.041000  49.90000
## 324  0.283920   0.00000  7.380000 0.00000000 0.5518466 5.708000  74.30000
## 325  0.341090   0.00000  7.380000 0.00000000 0.4930000 6.415000  40.10000
## 326  0.191860   0.00000  7.380000 0.00000000 0.4930000 6.431000  14.70000
## 327  0.303470   0.00000  7.380000 0.00000000 0.4930000 6.312000  28.90000
## 328  0.241030  11.38882  7.380000 0.00000000 0.4930000 6.083000  43.70000
## 329  0.066170   0.00000  3.240000 0.00000000 0.4600000 5.868000  25.80000
## 330  3.697218   0.00000  3.240000 0.00000000 0.4600000 6.333000  17.20000
## 331  0.045440  12.74468  3.240000 0.00000000 0.4600000 6.276758  32.20000
## 332  0.050230  35.00000  6.060000 0.00000000 0.4379000 5.706000  28.40000
## 333  0.034660  35.00000  6.060000 0.00000000 0.4379000 6.294016  23.30000
## 334  0.050830   0.00000  5.190000 0.00000000 0.5515030 6.316000  38.10000
## 335  0.037380   0.00000  5.190000 0.06854490 0.5469366 6.310000  38.50000
## 336  0.039610   0.00000  5.190000 0.00000000 0.5150000 6.037000  34.50000
## 337  0.034270   0.00000  5.190000 0.00000000 0.5150000 5.869000  46.30000
## 338  0.030410   0.00000  5.190000 0.05812967 0.5150000 5.895000  66.94728
## 339  3.666162   0.00000  5.190000 0.00000000 0.5150000 6.059000  37.30000
## 340  0.054970   0.00000  5.190000 0.05788536 0.5492025 5.985000  45.40000
## 341  0.061510   0.00000  5.190000 0.00000000 0.5150000 6.257435  58.50000
## 342  0.013010  35.00000  1.520000 0.00000000 0.4420000 7.241000  49.30000
## 343  0.024980   0.00000  1.890000 0.00000000 0.5180000 6.540000  59.70000
## 344  0.025430  55.00000  3.780000 0.00000000 0.4840000 6.696000  56.40000
## 345  0.030490  55.00000  3.780000 0.00000000 0.4840000 6.874000  28.10000
## 346  0.031130  15.17941  4.390000 0.00000000 0.4420000 6.251094  48.50000
## 347  0.061620  13.42085 10.317724 0.00000000 0.4420000 5.898000  52.30000
## 348  0.018700  85.00000  4.150000 0.00000000 0.4290000 6.516000  27.70000
## 349  0.015010  80.00000  2.010000 0.00000000 0.4350000 6.635000  29.70000
## 350  0.028990  19.43142  1.250000 0.00000000 0.4290000 6.939000  34.50000
## 351  0.062110  40.00000  1.250000 0.00000000 0.4290000 6.490000  44.40000
## 352  0.079500  60.00000  1.690000 0.00000000 0.4110000 6.579000  35.90000
## 353  0.072440  20.93096  1.690000 0.00000000 0.4110000 6.269690  18.50000
## 354  0.017090  90.00000  2.020000 0.00000000 0.4100000 6.381046  36.10000
## 355  0.043010  80.00000  1.910000 0.00000000 0.4130000 5.663000  21.90000
## 356  0.106590  80.00000  1.910000 0.00000000 0.4130000 5.936000  19.50000
## 357  8.982960   0.00000 18.100000 0.09080267 0.7700000 6.284490  97.40000
## 358  3.849700   0.00000 18.100000 1.00000000 0.7700000 6.395000  69.36786
## 359  5.201770   0.00000 18.100000 1.00000000 0.7700000 6.127000  83.40000
## 360  3.916003   0.00000 18.100000 0.15787651 0.7700000 6.112000  69.21598
## 361  4.541920   0.00000 18.100000 0.11970648 0.7700000 6.398000  88.00000
## 362  3.841865   0.00000 18.100000 0.00000000 0.7700000 6.251000  91.10000
## 363  3.678220   0.00000 18.100000 0.00000000 0.7700000 6.284566  96.20000
```

```
## 364  4.222390   0.00000 18.100000 1.00000000 0.7700000 5.803000  89.00000
## 365  3.474280   0.00000 18.100000 1.00000000 0.7180000 6.257197  70.13040
## 366  4.555870   0.00000 18.100000 0.00000000 0.7180000 3.561000  87.90000
## 367  4.405025   0.00000 18.100000 0.00000000 0.7180000 4.963000  91.40000
## 368 13.522200   0.00000 18.100000 0.00000000 0.5682577 3.863000 100.00000
## 369  4.898220  12.01727 18.100000 0.00000000 0.6310000 6.317047 100.00000
## 370  5.669980   0.00000 18.100000 0.08959375 0.6310000 6.683000  96.80000
## 371  6.538760   0.00000 18.100000 1.00000000 0.6310000 7.016000  97.50000
## 372  5.294297   0.00000 18.100000 0.00000000 0.6310000 6.216000 100.00000
## 373  8.267250   0.00000 18.100000 1.00000000 0.6680000 5.875000  89.60000
## 374 11.108100   0.00000 18.100000 0.00000000 0.6680000 6.173496 100.00000
## 375 18.498200   0.00000 18.100000 0.00000000 0.6680000 4.138000 100.00000
## 376 19.609100   0.00000 18.100000 0.00000000 0.6710000 7.313000  97.90000
## 377  6.311980   0.00000 18.100000 0.00000000 0.6710000 6.649000  93.30000
## 378  9.823490   0.00000 18.100000 0.00000000 0.6710000 6.794000  98.80000
## 379 23.648200   0.00000 18.100000 0.00000000 0.6710000 6.380000  96.20000
## 380 17.866700   0.00000 18.100000 0.00000000 0.6710000 6.223000 100.00000
## 381 88.976200  11.45733 18.100000 0.00000000 0.6710000 6.968000  91.90000
## 382 15.874400   0.00000 18.100000 0.00000000 0.6710000 6.545000  99.10000
## 383  9.187020   0.00000 18.100000 0.00000000 0.7000000 5.536000 100.00000
## 384  7.992480   0.00000 18.100000 0.00000000 0.7000000 5.520000 100.00000
## 385 20.084900   0.00000 18.100000 0.00000000 0.7000000 4.368000  91.20000
## 386 16.811800   0.00000 18.100000 0.06420499 0.7000000 5.277000  98.10000
## 387 24.393800   0.00000 18.100000 0.00000000 0.7000000 6.193366 100.00000
## 388 22.597100  10.80729 18.100000 0.00000000 0.7000000 5.000000  89.50000
## 389 14.333700  11.02572 18.100000 0.00000000 0.7000000 4.880000 100.00000
## 390  8.151740   0.00000 18.100000 0.00000000 0.7000000 5.390000  70.73469
## 391  6.962150   0.00000 11.109880 0.05900989 0.7000000 5.713000  97.00000
## 392  5.293050   0.00000 11.136146 0.00000000 0.7000000 6.051000  82.50000
## 393 11.577900   0.00000 18.100000 0.00000000 0.7000000 5.036000  97.00000
## 394  8.644760   0.00000 18.100000 0.00000000 0.6930000 6.193000  92.60000
## 395 13.359800   0.00000 18.100000 0.00000000 0.6930000 5.887000  94.70000
## 396  8.716750   0.00000 18.100000 0.00000000 0.6930000 6.471000  98.80000
## 397  5.872050   0.00000 18.100000 0.00000000 0.5647156 6.405000  96.00000
## 398  7.672020   0.00000 18.100000 0.00000000 0.6930000 5.747000  98.90000
## 399 38.351800   0.00000 18.100000 0.00000000 0.6930000 5.453000 100.00000
## 400  9.916550  10.92892 18.100000 0.00000000 0.6930000 5.852000  77.80000
## 401 25.046100   0.00000 18.100000 0.00000000 0.6930000 5.987000 100.00000
## 402 14.236200   0.00000 18.100000 0.00000000 0.6930000 6.343000 100.00000
## 403  9.595710   0.00000 18.100000 0.00000000 0.6930000 6.404000  71.07643
## 404 24.801700   0.00000 18.100000 0.00000000 0.6930000 5.349000  96.00000
## 405 41.529200   0.00000 18.100000 0.00000000 0.6930000 5.531000  85.40000
## 406 67.920800   0.00000 18.100000 0.00000000 0.6930000 5.683000 100.00000
## 407 20.716200   0.00000 18.100000 0.00000000 0.6590000 4.138000 100.00000
## 408 11.951100   0.00000 18.100000 0.00000000 0.6590000 5.608000 100.00000
## 409  7.403890   0.00000 18.100000 0.00000000 0.5970000 5.617000  97.90000
## 410 14.438300   0.00000 18.100000 0.00000000 0.5970000 6.852000  70.04382
## 411 51.135800   0.00000 11.019394 0.00000000 0.5690634 5.757000 100.00000
## 412 14.050700   0.00000 18.100000 0.00000000 0.5970000 6.657000 100.00000
## 413 18.811000  11.07120 18.100000 0.00000000 0.5683189 4.628000 100.00000
## 414 28.655800   0.00000 11.403111 0.00000000 0.5970000 5.155000 100.00000
## 415 45.746100   0.00000 18.100000 0.00000000 0.6930000 4.519000 100.00000
## 416 18.084600   0.00000 18.100000 0.00000000 0.5698690 6.434000 100.00000
## 417 10.834200   0.00000 11.282479 0.05922844 0.6790000 6.247622  90.80000
```

```
## 418 25.940600   0.00000 18.100000 0.05788024 0.6790000 5.304000  89.10000
## 419 73.534100   0.00000 18.100000 0.00000000 0.6790000 5.957000 100.00000
## 420 11.812300   0.00000 11.229386 0.00000000 0.7180000 6.824000  76.50000
## 421 11.087400   0.00000 18.100000 0.00000000 0.7180000 6.411000 100.00000
## 422  4.663481   0.00000 18.100000 0.05845930 0.7180000 6.006000  95.30000
## 423 12.048200   0.00000 18.100000 0.00000000 0.6140000 5.648000  69.77631
## 424  7.050420   0.00000 11.293245 0.00000000 0.6140000 6.103000  85.10000
## 425  8.792120   0.00000 11.399064 0.00000000 0.5840000 5.565000  70.60000
## 426  4.894782   0.00000 11.539752 0.00000000 0.6790000 5.896000  95.40000
## 427 12.247200   0.00000 18.100000 0.00000000 0.5840000 5.837000  59.70000
## 428 37.661900   0.00000 18.100000 0.00000000 0.6790000 6.202000  78.70000
## 429  7.367110   0.00000 18.100000 0.00000000 0.6790000 6.193000  78.10000
## 430  6.752547   0.00000 18.100000 0.00000000 0.6790000 6.263665  95.60000
## 431  8.492130   0.00000 18.100000 0.00000000 0.5840000 6.348000  86.10000
## 432 10.062300   0.00000 18.100000 0.00000000 0.5840000 6.833000  94.30000
## 433  6.444050   0.00000 18.100000 0.00000000 0.5840000 6.425000  74.80000
## 434  5.581070   0.00000 18.100000 0.00000000 0.5647056 6.436000  87.90000
## 435 13.913400  11.21036 18.100000 0.00000000 0.7130000 6.208000  71.21489
## 436 11.160400  11.14856 18.100000 0.00000000 0.7400000 6.629000  94.60000
## 437 14.420800  11.26092 18.100000 0.00000000 0.7400000 6.461000  93.30000
## 438 15.177200   0.00000 18.100000 0.00000000 0.7400000 6.152000 100.00000
## 439 13.678100   0.00000 18.100000 0.00000000 0.7400000 5.935000  87.90000
## 440  9.390630   0.00000 11.066656 0.00000000 0.7400000 6.256036  93.90000
## 441 22.051100   0.00000 11.171359 0.00000000 0.5709993 5.818000  92.40000
## 442  9.724180   0.00000 18.100000 0.00000000 0.7400000 6.406000  97.20000
## 443  5.666370   0.00000 18.100000 0.00000000 0.7400000 6.219000 100.00000
## 444  9.966540   0.00000 18.100000 0.00000000 0.7400000 6.485000 100.00000
## 445 12.802300   0.00000 11.327465 0.06048288 0.7400000 5.854000  96.60000
## 446 10.671800   0.00000 18.100000 0.00000000 0.7400000 6.459000  94.80000
## 447  6.288070   0.00000 18.100000 0.00000000 0.7400000 6.341000  96.40000
## 448  9.924850  11.18500 18.100000 0.00000000 0.7400000 6.251000  70.36093
## 449  9.329090   0.00000 18.100000 0.00000000 0.7130000 6.185000  98.70000
## 450  7.526010   0.00000 11.082847 0.00000000 0.7130000 6.417000  98.30000
## 451  6.717720   0.00000 18.100000 0.00000000 0.7130000 6.749000  92.60000
## 452  5.441140   0.00000 18.100000 0.00000000 0.7130000 6.655000  98.20000
## 453  4.170691   0.00000 18.100000 0.05997541 0.7130000 6.297000  91.80000
## 454  8.248090  11.43384 18.100000 0.00000000 0.5650092 7.393000  99.30000
## 455  9.513630   0.00000 18.100000 0.05711171 0.7130000 6.728000  94.10000
## 456  4.752370   0.00000 18.100000 0.00000000 0.7130000 6.525000  86.50000
## 457  4.668830   0.00000 18.100000 0.00000000 0.7130000 5.976000  87.90000
## 458  8.200580   0.00000 11.183412 0.00000000 0.7130000 5.936000  80.30000
## 459  7.752230   0.00000 11.131169 0.00000000 0.7130000 6.301000  83.70000
## 460  6.801170  11.41448 18.100000 0.00000000 0.7130000 6.081000  84.40000
## 461  4.812130   0.00000 18.100000 0.00000000 0.7130000 6.701000  90.00000
## 462  3.693110   0.00000 18.100000 0.00000000 0.7130000 6.376000  88.40000
## 463  6.654920   0.00000 18.100000 0.00000000 0.7130000 6.317000  69.21979
## 464  5.821150   0.00000 11.254973 0.00000000 0.7130000 6.513000  68.53343
## 465  7.839320   0.00000 18.100000 0.05918763 0.6550000 6.284557  65.40000
## 466  3.163600  11.26820 18.100000 0.00000000 0.6550000 5.759000  48.20000
## 467  3.774980   0.00000 11.636790 0.00000000 0.6550000 6.279258  84.70000
## 468  4.422280   0.00000 18.100000 0.00000000 0.5659906 6.003000  94.50000
## 469 15.575700   0.00000 18.100000 0.00000000 0.5800000 5.926000  71.00000
## 470 13.075100   0.00000 18.100000 0.00000000 0.5800000 5.713000  56.70000
## 471  4.348790   0.00000 18.100000 0.00000000 0.5800000 6.167000  84.00000
```

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## 472  4.040931   0.00000 18.100000 0.06021696 0.5320000 6.229000  90.70000
## 473  3.568680   0.00000 18.100000 0.00000000 0.5800000 6.437000  75.00000
## 474  4.646890   0.00000 18.100000 0.00000000 0.5629647 6.980000  67.60000
## 475  8.055790   0.00000 18.100000 0.00000000 0.5840000 5.427000  95.40000
## 476  6.393120   0.00000 18.100000 0.00000000 0.5840000 6.162000  97.40000
## 477  4.871410   0.00000 18.100000 0.00000000 0.6140000 6.484000  93.60000
## 478  4.342882   0.00000 18.100000 0.00000000 0.6140000 5.304000  97.30000
## 479 10.233000   0.00000 11.173734 0.00000000 0.6140000 6.282056  96.70000
## 480 14.333700   0.00000 18.100000 0.00000000 0.6140000 6.229000  88.00000
## 481  4.393694   0.00000 18.100000 0.00000000 0.5320000 6.242000  68.63621
## 482  5.708180  11.40568 18.100000 0.00000000 0.5320000 6.750000  74.90000
## 483  5.731160   0.00000 18.100000 0.00000000 0.5320000 7.061000  77.00000
## 484  2.818380   0.00000 18.100000 0.00000000 0.5320000 5.762000  40.30000
## 485  2.378570  11.34129 18.100000 0.00000000 0.5830000 5.871000  67.89233
## 486  3.673670   0.00000 18.100000 0.00000000 0.5830000 6.312000  51.90000
## 487  5.691750   0.00000 18.100000 0.00000000 0.5830000 6.114000  79.80000
## 488  4.835670   0.00000 18.100000 0.00000000 0.5830000 5.905000  53.20000
## 489  0.150860   0.00000 27.740000 0.00000000 0.6090000 5.454000  92.70000
## 490  0.183370   0.00000 27.740000 0.00000000 0.5731800 5.414000  98.30000
## 491  0.207460   0.00000 27.740000 0.00000000 0.6090000 5.093000  98.00000
## 492  0.105740   0.00000 12.109507 0.00000000 0.6090000 5.983000  98.80000
## 493  0.111320   0.00000 27.740000 0.00000000 0.6090000 6.236402  83.50000
## 494  0.173310   0.00000  9.690000 0.00000000 0.5850000 5.707000  54.00000
## 495  0.279570   0.00000 10.664760 0.00000000 0.5850000 6.272416  42.60000
## 496  0.178990   0.00000  9.690000 0.00000000 0.5525504 5.670000  28.80000
## 497  0.289600   0.00000  9.690000 0.00000000 0.5850000 5.390000  72.90000
## 498  0.268380   0.00000  9.690000 0.05659124 0.5850000 5.794000  70.60000
## 499  0.239120   0.00000  9.690000 0.00000000 0.5593418 6.019000  65.30000
## 500  0.177830   0.00000  9.690000 0.00000000 0.5850000 6.261801  73.50000
## 501  0.224380   0.00000  9.690000 0.00000000 0.5850000 6.027000  79.70000
## 502  0.062630   0.00000 11.930000 0.00000000 0.5730000 6.593000  69.10000
## 503  0.045270   0.00000 11.930000 0.00000000 0.5730000 6.120000  76.70000
## 504  0.060760   0.00000 11.930000 0.00000000 0.5730000 6.976000  91.00000
## 505  0.109590  11.39867 11.930000 0.00000000 0.5730000 6.794000  89.30000
## 506  0.047410   0.00000 11.930000 0.00000000 0.5730000 6.030000  80.80000
##          dis       rad      tax  ptratio    black    lstat     medv
## 1   4.090000  1.000000 296.0000 15.30000 359.7887  4.98000 24.00000
## 2   3.816437  2.000000 242.0000 17.80000 396.9000  9.14000 21.60000
## 3   4.967100  2.000000 242.0000 17.80000 392.8300 11.75162 34.70000
## 4   6.062200  3.000000 222.0000 18.70000 394.6300  2.94000 33.40000
## 5   6.062200  3.000000 222.0000 18.70000 396.9000  5.33000 23.64224
## 6   6.062200  3.000000 222.0000 18.70000 360.0093  5.21000 28.70000
## 7   5.560500  5.000000 311.0000 15.20000 395.6000 12.43000 22.20743
## 8   5.950500  9.238308 311.0000 15.20000 396.9000 19.15000 22.41592
## 9   6.082100  9.094070 311.0000 15.20000 386.6300 29.93000 16.50000
## 10  6.592100  5.000000 311.0000 15.20000 386.7100 12.92188 18.90000
## 11  6.346700  5.000000 311.0000 15.20000 392.5200 20.45000 15.00000
## 12  6.226700  5.000000 311.0000 15.20000 357.7633 13.27000 18.90000
## 13  5.450900  5.000000 311.0000 15.20000 390.5000 15.71000 21.70000
## 14  4.707500  4.000000 398.8904 21.00000 356.9724  8.26000 20.40000
## 15  4.461900  4.000000 307.0000 21.00000 380.0200 10.26000 18.20000
## 16  4.498600  4.000000 307.0000 21.00000 395.6200 12.64809 19.90000
## 17  4.498600  4.000000 307.0000 21.00000 386.8500  6.58000 23.10000
## 18  4.257900  4.000000 307.0000 21.00000 386.7500 14.67000 17.50000
```

```
## 19   3.796500  9.001237 307.0000 21.00000 288.9900 13.17573 20.20000
## 20   3.796500  4.000000 307.0000 21.00000 390.9500 12.72624 18.20000
## 21   3.782488  4.000000 399.9166 21.00000 376.5700 21.02000 13.60000
## 22   4.012300  4.000000 397.9825 21.00000 392.5300 13.83000 19.60000
## 23   3.976900  8.685494 307.0000 21.00000 354.0439 18.72000 15.20000
## 24   4.095200  4.000000 307.0000 21.00000 394.5400 19.88000 14.50000
## 25   4.399600  4.000000 307.0000 21.00000 394.3300 16.30000 15.60000
## 26   4.454600  4.000000 307.0000 21.00000 303.4200 16.51000 13.90000
## 27   3.799697  4.000000 307.0000 18.63965 376.8800 12.91787 16.60000
## 28   4.453400  4.000000 307.0000 18.69834 306.3800 17.28000 14.80000
## 29   4.454700  4.000000 307.0000 21.00000 387.9400 12.80000 18.40000
## 30   4.239000  4.000000 307.0000 21.00000 380.2300 11.98000 21.00000
## 31   4.233000  4.000000 307.0000 21.00000 360.1700 22.60000 12.70000
## 32   3.856470  4.000000 307.0000 21.00000 355.3535 13.04000 14.50000
## 33   3.990000  4.000000 307.0000 18.41703 232.6000 27.71000 21.76601
## 34   3.743385  4.000000 307.0000 21.00000 358.7700 18.35000 13.10000
## 35   3.759800  4.000000 395.2935 21.00000 248.3100 20.34000 13.50000
## 36   3.360300  9.108157 398.0283 19.20000 396.9000  9.68000 18.90000
## 37   3.377900  5.000000 279.0000 19.20000 377.5600 11.41000 20.00000
## 38   3.934200  5.000000 279.0000 19.20000 396.9000  8.77000 21.00000
## 39   3.847300  5.000000 399.1649 19.20000 359.6853 10.13000 24.70000
## 40   5.401100  3.000000 252.0000 18.30000 395.6300  4.32000 30.80000
## 41   5.401100  3.000000 252.0000 18.30000 395.6200  1.98000 34.90000
## 42   5.720900  3.000000 392.4458 17.90000 385.4100  4.84000 22.97347
## 43   5.720900  8.902947 233.0000 17.90000 359.8233  5.81000 25.30000
## 44   5.720900  3.000000 233.0000 17.90000 394.4600  7.44000 24.70000
## 45   3.847863  3.000000 233.0000 18.40499 389.3900  9.55000 21.20000
## 46   5.100400  8.982661 233.0000 17.90000 396.9000 12.78543 19.30000
## 47   5.100400  3.000000 233.0000 18.41169 396.9000 14.15000 20.00000
## 48   5.689400  3.000000 233.0000 17.90000 392.7400 18.80000 16.60000
## 49   5.870000  3.000000 233.0000 17.90000 396.9000 30.81000 21.75997
## 50   6.087700  3.000000 233.0000 17.90000 396.9000 16.20000 19.40000
## 51   6.814700  4.000000 243.0000 16.80000 395.5600 13.45000 19.70000
## 52   6.814700  4.000000 243.0000 16.80000 393.9700  9.43000 20.50000
## 53   6.814700  4.000000 243.0000 16.80000 396.9000  5.28000 25.00000
## 54   6.814700  4.000000 400.3951 16.80000 396.9000  8.43000 23.40000
## 55   7.319700  3.000000 469.0000 21.10000 396.9000 14.80000 18.90000
## 56   8.696600  5.000000 226.0000 17.90000 395.9300  4.81000 35.40000
## 57   9.187600  8.305455 313.0000 17.30000 396.9000  5.77000 24.70000
## 58   8.324800  5.000000 256.0000 15.10000 360.5637  3.95000 24.08482
## 59   4.119003  8.000000 284.0000 19.70000 390.6800  6.86000 23.30000
## 60   6.932000  8.000000 284.0000 19.70000 360.3422 12.48477 19.60000
## 61   7.225400  8.000000 284.0000 19.70000 395.1100 13.15000 18.70000
## 62   6.818500  8.000000 284.0000 18.42994 378.0800 14.44000 16.00000
## 63   7.225500  8.000000 284.0000 19.70000 396.9000  6.73000 22.60631
## 64   7.980900  8.000000 284.0000 19.70000 395.5800  9.50000 25.00000
## 65   9.222900  3.000000 216.0000 18.60000 393.2400  8.05000 33.00000
## 66   6.611500  4.000000 337.0000 16.10000 396.9000  4.67000 23.50000
## 67   6.611500  4.000000 337.0000 16.10000 396.9000 10.24000 19.40000
## 68   6.498000  4.000000 397.7054 18.90000 359.2168  8.10000 22.00000
## 69   6.498000  8.791986 345.0000 18.90000 396.9000 13.09000 22.09079
## 70   6.498000  4.000000 345.0000 18.90000 396.9000  8.79000 20.90000
## 71   5.287300  4.000000 305.0000 19.20000 383.7300 12.34358 24.20000
## 72   5.287300  4.000000 305.0000 19.20000 359.8835  9.88000 21.70000
```

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## 73   5.287300  4.000000 305.0000 19.20000 359.7717  5.52000 22.80000
## 74   3.969498  4.000000 305.0000 19.20000 377.1700  7.54000 23.40000
## 75   4.251500  5.000000 398.0000 18.70000 394.9200  6.78000 24.10000
## 76   4.502600  5.000000 398.0000 18.70000 383.2300  8.94000 22.42949
## 77   4.052200  5.000000 398.0000 18.70000 373.6600 11.97000 20.00000
## 78   4.090500  5.000000 398.0000 18.70000 386.9600 10.27000 20.80000
## 79   5.014100  5.000000 398.0000 18.70000 386.4000 12.34000 21.20000
## 80   4.502600  5.000000 398.0000 18.70000 396.0600  9.10000 20.30000
## 81   5.400700  4.000000 281.0000 18.50569 396.9000  5.29000 28.00000
## 82   5.400700  8.472146 281.0000 19.00000 395.6300  7.22000 23.90000
## 83   5.400700  4.000000 281.0000 19.00000 396.9000  6.72000 24.80000
## 84   5.400700  4.000000 400.6563 19.00000 390.6400  7.51000 22.37789
## 85   4.779400  3.000000 247.0000 18.50000 396.9000  9.62000 23.90000
## 86   4.437700  3.000000 247.0000 18.43785 392.3000  6.53000 26.60000
## 87   4.427200  3.000000 247.0000 18.50000 395.9900 12.86000 22.50000
## 88   3.747600  3.000000 247.0000 18.50000 395.1500  8.44000 22.20000
## 89   3.421700  2.000000 270.0000 17.80000 396.9000  5.50000 23.60000
## 90   3.414500  2.000000 270.0000 17.80000 396.0600  5.70000 28.70000
## 91   3.092300  2.000000 270.0000 17.80000 392.1800  8.81000 22.60000
## 92   3.092100  2.000000 270.0000 17.80000 393.5500 12.71262 22.00000
## 93   3.665900  4.000000 270.0000 18.20000 395.0100  8.16000 22.90000
## 94   3.665900  4.000000 270.0000 18.37997 396.3300  6.21000 25.00000
## 95   3.615000  8.312820 270.0000 18.20000 396.9000 12.42501 20.60000
## 96   3.495200  2.000000 276.0000 18.00000 357.9800  6.65000 28.40000
## 97   3.495200  2.000000 276.0000 18.00000 391.8300 11.34000 21.40000
## 98   3.495200  2.000000 276.0000 18.23315 396.9000  4.21000 38.70000
## 99   3.790481  2.000000 276.0000 18.00000 393.5300  3.57000 43.80000
## 100  3.796200  2.000000 276.0000 18.00000 396.9000  6.19000 33.20000
## 101  2.777800  5.000000 402.8163 20.90000 359.8989  9.42000 27.50000
## 102  2.856100  5.000000 384.0000 18.47864 395.5800  7.67000 26.50000
## 103  2.714700  5.000000 384.0000 20.90000 360.5127 10.63000 22.15124
## 104  2.714700  5.000000 384.0000 20.90000 394.4700 13.44000 19.30000
## 105  2.421000  5.000000 384.0000 20.90000 392.6900 12.33000 20.10000
## 106  2.106900  8.968364 384.0000 20.90000 394.0500 16.47000 19.50000
## 107  2.211000  5.000000 395.9319 20.90000 395.6700 18.66000 19.50000
## 108  2.122400  5.000000 384.0000 20.90000 387.6900 14.09000 20.40000
## 109  3.743362  5.000000 384.0000 20.90000 395.2400 12.27000 19.80000
## 110  2.545100  5.000000 384.0000 20.90000 391.2300 15.55000 19.40000
## 111  2.777800  9.196005 384.0000 18.54781 393.4900 13.00000 21.70000
## 112  2.677500  9.236667 432.0000 18.37626 395.5900 10.16000 22.80000
## 113  2.353400  6.000000 432.0000 18.53632 394.9500 16.21000 22.00425
## 114  2.548000  6.000000 432.0000 17.80000 353.2539 17.09000 18.70000
## 115  2.256500  6.000000 432.0000 18.44144 388.7400 10.45000 18.50000
## 116  3.766621  6.000000 432.0000 17.80000 344.9100 15.76000 18.30000
## 117  2.730100  9.225492 432.0000 17.80000 393.3000 12.04000 21.20000
## 118  2.747400  6.000000 407.6010 17.80000 394.5100 10.30000 19.20000
## 119  2.477500  6.000000 432.0000 17.80000 338.6300 15.37000 20.40000
## 120  3.683345  6.000000 432.0000 17.80000 391.5000 13.61000 19.30000
## 121  2.257700  2.000000 188.0000 19.10000 389.1500 14.37000 22.00000
## 122  2.197400  2.000000 188.0000 19.10000 377.6700 14.27000 20.30000
## 123  2.086900  2.000000 188.0000 19.10000 378.0900 17.93000 22.17304
## 124  1.944400  2.000000 368.2235 19.10000 370.3100 25.41000 21.80349
## 125  2.006300  2.000000 188.0000 18.50606 379.3800 12.69182 18.80000
## 126  1.992900  2.000000 188.0000 19.10000 361.6978 14.81000 21.40000
```

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## 127  1.757200  2.000000 188.0000 19.10000 359.2900 27.26000 21.78035
## 128  1.788300  4.000000 437.0000 21.20000 392.1100 17.19000 21.27286
## 129  1.812500  4.000000 418.2169 21.20000 360.3249 15.39000 18.00000
## 130  1.979900  8.831573 437.0000 21.20000 396.9000 18.34000 14.30000
## 131  2.118500  4.000000 437.0000 21.20000 395.0400 12.74598 19.20000
## 132  2.271000  4.000000 437.0000 21.20000 396.9000 12.26000 19.60000
## 133  2.327400  4.000000 437.0000 21.20000 385.7600 11.12000 23.00000
## 134  2.469900  4.000000 437.0000 21.20000 388.6900 15.03000 18.40000
## 135  2.346000  4.000000 437.0000 21.20000 262.7600 17.31000 15.60000
## 136  2.110700  4.000000 437.0000 18.67543 394.6700 16.96000 18.10000
## 137  3.638442  4.000000 437.0000 21.20000 378.2500 16.90000 17.40000
## 138  1.849800  4.000000 437.0000 21.20000 394.0800 14.59000 17.10000
## 139  1.668600  4.000000 437.0000 21.20000 392.0400 21.32000 13.30000
## 140  3.561514  4.000000 437.0000 18.76195 396.9000 13.04646 17.80000
## 141  1.611900  4.000000 437.0000 21.20000 388.0800 12.95673 14.00000
## 142  1.439400  4.000000 437.0000 21.20000 396.9000 34.41000 14.40000
## 143  1.321600  9.785877 403.0000 14.70000 396.9000 26.82000 13.40000
## 144  1.411800  9.570480 403.0000 14.70000 396.9000 26.42000 15.60000
## 145  1.345900  5.000000 403.0000 14.70000 396.9000 29.29000 11.80000
## 146  1.419100  5.000000 403.0000 17.84277 172.9100 27.80000 13.80000
## 147  1.516600  9.206272 403.0000 14.70000 353.4884 16.65000 15.60000
## 148  1.460800  5.000000 403.0000 14.70000 391.7100 29.53000 14.60000
## 149  1.529600  5.000000 403.0000 14.70000 356.9900 28.32000 17.80000
## 150  1.525700  5.000000 403.0000 14.70000 351.8500 21.45000 15.40000
## 151  1.618000  5.000000 403.0000 14.70000 372.8000 14.10000 21.50000
## 152  1.591600  5.000000 403.5770 14.70000 341.6000 13.28000 19.60000
## 153  1.610200  9.188244 403.0000 14.70000 343.2800 12.12000 15.30000
## 154  1.623200  5.000000 403.0000 14.70000 261.9500 15.79000 19.40000
## 155  1.749400  5.000000 403.0000 14.70000 321.0200 15.12000 17.00000
## 156  1.745500  5.000000 403.0000 14.70000  88.0100 15.02000 15.60000
## 157  1.736400  5.000000 406.8889 14.70000  88.6300 12.98634 13.10000
## 158  1.877300  5.000000 403.0000 14.70000 363.4300  4.59000 41.30000
## 159  1.757300  5.000000 403.0000 14.70000 353.8900  6.43000 24.30000
## 160  1.765900  5.000000 403.0000 18.13192 364.3100  7.39000 23.30000
## 161  1.798400  5.000000 403.0000 14.70000 338.9200  5.50000 27.00000
## 162  1.970900  5.000000 403.0000 18.25755 374.4300  1.73000 50.00000
## 163  2.040700  5.000000 403.0000 14.70000 389.6100  1.92000 50.00000
## 164  3.643201  9.167170 403.0000 14.70000 388.4500  3.32000 50.00000
## 165  2.422000  5.000000 403.0000 14.70000 395.1100 11.64000 22.70000
## 166  2.283400  5.000000 403.0000 14.70000 240.1600  9.81000 25.00000
## 167  2.045900  5.000000 403.0000 14.70000 369.3000 12.48364 24.31413
## 168  2.425900  5.000000 399.6557 14.70000 227.6100 12.14000 23.80000
## 169  2.100000  5.000000 403.0000 14.70000 297.0900 11.10000 23.80000
## 170  3.522118  5.000000 403.0000 14.70000 358.7099 12.57944 22.30000
## 171  2.425900  5.000000 403.0000 14.70000 292.2900 14.43000 17.40000
## 172  2.388700  5.000000 403.0000 14.70000 348.1300 12.03000 19.10000
## 173  2.596100  5.000000 296.0000 16.60000 396.9000 14.69000 23.10000
## 174  2.646300  5.000000 296.0000 16.60000 395.5000  9.04000 23.60000
## 175  2.701900  5.000000 296.0000 16.60000 393.2300  9.64000 22.60000
## 176  3.132300  5.000000 296.0000 16.60000 390.9600  5.33000 22.60670
## 177  3.554900  8.745488 401.9139 16.60000 393.2300 10.11000 23.20000
## 178  3.317500  5.000000 296.0000 16.60000 359.4152  6.29000 24.60000
## 179  2.915300  5.000000 397.3334 16.60000 391.2700  6.92000 29.90000
## 180  2.829000  3.000000 193.0000 17.80000 396.9000  5.04000 37.20000
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## 181  2.741000  3.000000 193.0000 17.80000 395.5600  7.56000 39.80000
## 182  2.597900  8.914418 193.0000 17.80000 396.9000  9.45000 36.20000
## 183  2.700600  3.000000 193.0000 17.80000 394.1200  4.82000 37.90000
## 184  2.847000  3.000000 193.0000 17.80000 396.9000  5.68000 23.19677
## 185  2.987900  3.000000 193.0000 17.80000 391.0000 13.98000 26.40000
## 186  3.279700  3.000000 193.0000 17.80000 387.1100 12.27987 29.60000
## 187  3.199200  3.000000 193.0000 17.80000 392.6300  4.45000 50.00000
## 188  3.788600  5.000000 398.0000 15.20000 393.8700  6.68000 32.00000
## 189  4.566700  5.000000 398.0000 15.20000 382.8400  4.56000 29.80000
## 190  4.566700  5.000000 398.0000 15.20000 396.9000  5.39000 34.90000
## 191  6.479800  5.000000 398.0000 15.20000 377.6800  5.10000 37.00000
## 192  6.479800  8.991919 398.0000 15.20000 389.7100 12.19508 30.50000
## 193  6.479800  5.000000 398.0000 15.20000 390.4900  2.87000 36.40000
## 194  6.219600  8.019412 265.0000 15.60000 393.3700 11.63498 31.10000
## 195  6.219600  1.000000 265.0000 15.60000 376.7000  4.38000 29.10000
## 196  5.648400  4.000000 255.0000 14.40000 360.9208  2.97000 50.00000
## 197  7.309000  2.000000 329.0000 12.60000 396.9000  4.08000 24.41796
## 198  7.309000  2.000000 329.0000 12.60000 354.3100  8.61000 30.30000
## 199  7.309000  2.000000 329.0000 12.60000 392.2000  6.62000 23.28349
## 200  7.653400  3.000000 402.0000 17.00000 396.9000  4.56000 34.90000
## 201  7.653400  3.000000 402.0000 17.00000 384.3000  4.45000 32.90000
## 202  6.270000  2.000000 348.0000 14.70000 393.7700  7.43000 24.10000
## 203  6.270000  2.000000 348.0000 14.70000 360.3178  3.11000 42.30000
## 204  5.118000  4.000000 224.0000 14.70000 392.7800  3.81000 48.50000
## 205  5.118000  4.000000 224.0000 14.70000 390.5500  2.88000 50.00000
## 206  3.945400  4.000000 277.0000 18.60000 396.9000 10.87000 22.60000
## 207  4.354900  4.000000 277.0000 18.60000 394.8700 10.97000 24.40000
## 208  4.354900  4.000000 396.5392 18.60000 389.4300 18.06000 22.08653
## 209  4.239200  4.000000 277.0000 18.60000 381.3200 14.66000 24.40000
## 210  3.875000  4.000000 277.0000 18.60000 396.9000 23.09000 20.00000
## 211  3.877100  4.000000 277.0000 18.60000 393.2500 17.27000 21.70000
## 212  3.665000  4.000000 277.0000 18.60000 395.2400 23.98000 19.30000
## 213  3.652600  4.000000 277.0000 18.60000 390.9400 16.03000 22.40824
## 214  3.945400  4.000000 277.0000 18.60000 385.8100  9.38000 28.10000
## 215  3.587500  4.000000 277.0000 18.60000 348.9300 29.55000 23.70000
## 216  3.945400  4.000000 277.0000 18.60000 393.6300  9.47000 25.00000
## 217  3.112100  5.000000 276.0000 16.40000 392.8000 13.51000 23.30000
## 218  3.421100  5.000000 276.0000 18.34317 392.7800  9.69000 28.70000
## 219  2.889300  5.000000 276.0000 18.54449 396.9000 17.92000 21.50000
## 220  3.720197  5.000000 276.0000 16.40000 393.7400 10.50000 23.00000
## 221  2.861700  8.000000 307.0000 17.40000 391.7000  9.71000 26.70000
## 222  3.048000  8.000000 307.0000 18.39287 395.2400 21.46000 22.07488
## 223  3.272100  8.000000 307.0000 18.34407 390.3900  9.93000 27.50000
## 224  3.272100  8.000000 307.0000 17.40000 396.9000  7.60000 30.10000
## 225  2.894400  8.000000 307.0000 17.40000 360.8844  4.14000 44.80000
## 226  2.894400  9.246263 307.0000 17.40000 382.0000  4.63000 26.33540
## 227  3.215700  8.000000 307.0000 17.40000 387.3800  3.13000 37.60000
## 228  3.215700  9.223205 307.0000 17.40000 372.0800  6.36000 31.60000
## 229  3.375100  8.000000 307.0000 17.40000 377.5100  3.92000 46.70000
## 230  3.375100  9.094879 307.0000 17.40000 380.3400  3.76000 31.50000
## 231  3.671500  8.000000 307.0000 18.38915 378.3500 11.65000 24.30000
## 232  3.671500  8.000000 307.0000 17.40000 376.1400  5.25000 31.70000
## 233  3.838400  8.000000 396.7070 17.40000 385.9100  2.47000 41.70000
## 234  3.651900  8.000000 307.0000 17.40000 378.9500  3.95000 48.30000
```

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## 235  3.651900  8.000000 307.0000 17.40000 360.2000  8.05000 22.74698
## 236  3.743905  8.000000 307.0000 17.40000 376.7500 10.88000 22.48954
## 237  4.148000  8.000000 307.0000 17.40000 388.4500 12.33859 25.10000
## 238  4.148000  8.000000 307.0000 18.36628 390.0700  4.73000 23.94477
## 239  6.189900  6.000000 300.0000 16.60000 379.4100  6.36000 23.70000
## 240  6.189900  6.000000 300.0000 16.60000 383.7800  7.37000 23.30000
## 241  6.336100  6.000000 300.0000 16.60000 391.2500 11.38000 23.08663
## 242  6.336100  9.048504 300.0000 16.60000 394.6200 12.40000 20.10000
## 243  7.035500  6.000000 300.0000 16.60000 360.0255 11.22000 22.20000
## 244  7.035500  6.000000 300.0000 16.60000 359.9200  5.19000 23.70000
## 245  4.035885  7.000000 330.0000 19.10000 372.4900 12.50000 17.60000
## 246  7.954900  7.000000 330.0000 19.10000 389.1300 18.46000 18.50000
## 247  8.055500  7.000000 330.0000 19.10000 390.1800  9.16000 24.30000
## 248  8.055500  7.000000 330.0000 19.10000 376.1400 10.15000 20.50000
## 249  7.826500  7.000000 401.3511 19.10000 374.7100  9.52000 24.50000
## 250  7.826500  7.000000 330.0000 19.10000 393.7400  6.56000 26.20000
## 251  7.396700  7.000000 330.0000 19.10000 396.2800  5.90000 24.40000
## 252  4.143404  7.000000 330.0000 19.10000 377.0700  3.59000 24.80000
## 253  8.906700  7.000000 396.4054 19.10000 386.0900  3.53000 24.21614
## 254  8.906700  7.000000 330.0000 19.10000 396.9000  3.54000 42.80000
## 255  9.220300  1.000000 315.0000 16.40000 392.8900  6.57000 21.90000
## 256  9.220300  1.000000 315.0000 16.40000 395.1800  9.25000 20.90000
## 257  3.927006  3.000000 244.0000 15.90000 386.3400  3.11000 44.00000
## 258  1.801000  5.000000 387.9656 13.00000 389.7000  5.12000 50.00000
## 259  1.894600  5.000000 264.0000 13.00000 383.2900  7.79000 36.00000
## 260  2.010700  9.048044 382.5997 17.99131 391.9300  6.90000 30.10000
## 261  2.112100  5.000000 264.0000 13.00000 392.8000  9.59000 33.80000
## 262  2.139800  5.000000 264.0000 13.00000 388.3700  7.26000 43.10000
## 263  2.288500  5.000000 264.0000 13.00000 386.8600  5.91000 48.80000
## 264  2.078800  5.000000 264.0000 13.00000 393.4200 11.25000 23.24054
## 265  1.930100  5.000000 264.0000 17.72342 387.8900  8.10000 36.50000
## 266  1.986500  5.000000 264.0000 13.00000 392.4000 10.45000 22.80000
## 267  2.132900  5.000000 264.0000 13.00000 384.0700 14.79000 30.70000
## 268  2.421600  5.000000 264.0000 13.00000 384.5400  7.44000 50.00000
## 269  2.872000  5.000000 264.0000 13.00000 390.3000  3.16000 24.01448
## 270  3.771254  3.000000 223.0000 18.60000 391.3400 13.65000 20.70000
## 271  3.845504  3.000000 223.0000 18.60000 388.6500 13.00000 21.10000
## 272  4.429000  3.000000 223.0000 18.60000 396.9000  6.59000 25.20000
## 273  3.917500  3.000000 391.5741 18.60000 394.9600 12.13176 24.40000
## 274  4.366500  3.000000 223.0000 18.60000 390.7700 12.06542 35.20000
## 275  4.077600  4.000000 254.0000 17.60000 396.9000  3.53000 32.40000
## 276  4.267300  4.000000 254.0000 17.60000 359.7451  2.98000 32.00000
## 277  4.787200  4.000000 254.0000 17.60000 389.2500  6.05000 33.20000
## 278  4.862800  4.000000 254.0000 17.60000 393.4500  4.16000 33.10000
## 279  4.140300  4.000000 254.0000 17.60000 396.9000  7.19000 29.10000
## 280  4.100700  5.000000 216.0000 14.90000 396.9000  4.85000 35.10000
## 281  4.694700  5.000000 393.6714 14.90000 387.3100  3.76000 45.40000
## 282  5.244700  5.000000 216.0000 14.90000 392.2300 11.48554 35.40000
## 283  5.211900  5.000000 216.0000 14.90000 377.0700  3.01000 46.00000
## 284  4.338739  1.000000 198.0000 13.60000 395.5200  3.16000 26.14604
## 285  7.307300  1.000000 285.0000 15.30000 394.7200  7.85000 32.20000
## 286  7.307300  1.000000 386.4912 15.30000 394.7200  8.23000 22.00000
## 287  4.275260  1.000000 241.0000 18.20000 341.6000 12.93000 20.10000
## 288  7.317200  6.000000 293.0000 16.60000 396.9000  7.14000 23.20000
```

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## 289  3.995843  6.000000 293.0000 16.60000 360.1227  7.60000 22.30000
## 290  7.317200  6.000000 293.0000 18.40350 371.7200  9.51000 24.80000
## 291  5.116700  4.000000 245.0000 19.20000 360.2610  3.33000 28.50000
## 292  5.116700  4.000000 245.0000 19.20000 396.9000  3.56000 37.30000
## 293  5.116700  4.000000 395.4247 19.20000 396.9000  4.70000 27.90000
## 294  5.502700  4.000000 289.0000 16.00000 396.9000  8.58000 23.90000
## 295  5.502700  4.000000 289.0000 16.00000 396.9000 12.62212 21.70000
## 296  5.960400  4.000000 289.0000 16.00000 396.9000  6.27000 28.60000
## 297  5.960400  4.000000 289.0000 16.00000 392.8500  7.39000 27.10000
## 298  6.320000  4.000000 289.0000 16.00000 396.9000 15.84000 20.30000
## 299  3.989130  5.000000 358.0000 14.80000 368.2400  4.97000 22.50000
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## 303  5.491700  7.000000 329.0000 16.10000 383.6100  8.67000 26.40000
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## 305  3.951331  7.000000 222.0000 18.40000 393.6800  6.93000 36.10000
## 306  3.370000  8.491190 222.0000 18.40000 393.3600  8.93000 28.40000
## 307  3.099200  7.000000 222.0000 18.29967 396.9000  6.47000 33.40000
## 308  3.752369  7.000000 222.0000 18.40000 396.9000  7.53000 28.20000
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## 310  3.102500  4.000000 304.0000 18.40000 396.2400  9.97000 20.30000
## 311  2.519400  4.000000 304.0000 18.40000 350.4500 13.66803 16.10000
## 312  2.640300  4.000000 304.0000 18.40000 396.9000  5.98000 22.10000
## 313  2.834000  4.000000 304.0000 18.40000 396.3000 11.72000 22.42201
## 314  3.262800  4.000000 304.0000 18.40000 393.3900  7.90000 21.60000
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## 317  3.998600  4.000000 304.0000 18.40000 390.7000 18.33000 17.80000
## 318  4.031700  4.000000 304.0000 18.40000 357.9864 15.94000 19.80000
## 319  3.532500  4.000000 304.0000 18.40000 395.2100 10.36000 23.10000
## 320  4.001900  4.000000 304.0000 18.40000 396.2300 12.73000 21.00000
## 321  4.540400  5.000000 287.0000 19.60000 396.9000  7.20000 23.80000
## 322  4.540400  5.000000 400.5951 19.60000 396.9000  6.87000 23.10000
## 323  4.721100  5.000000 287.0000 19.60000 396.9000 12.64517 20.40000
## 324  4.721100  5.000000 287.0000 19.60000 391.1300 11.74000 18.50000
## 325  4.721100  5.000000 401.3379 19.60000 396.9000  6.12000 25.00000
## 326  5.415900  8.708040 287.0000 19.60000 393.6800  5.08000 22.83117
## 327  3.828680  5.000000 287.0000 19.60000 396.9000  6.15000 23.00000
## 328  5.415900  5.000000 287.0000 19.60000 396.9000 12.79000 22.20000
## 329  5.214600  4.000000 430.0000 16.90000 382.4400  9.97000 19.30000
## 330  5.214600  4.000000 430.0000 16.90000 375.2100  7.34000 22.60000
## 331  5.873600  4.000000 430.0000 16.90000 368.5700  9.09000 19.80000
## 332  6.640700  8.797218 304.0000 16.90000 394.0200 12.43000 17.10000
## 333  4.121269  1.000000 304.0000 16.90000 362.2500  7.83000 19.40000
## 334  6.458400  8.917530 224.0000 20.20000 389.7100  5.68000 22.20000
## 335  6.458400  5.000000 390.7604 20.20000 389.4000  6.75000 20.70000
## 336  5.985300  5.000000 224.0000 20.20000 396.9000  8.01000 21.10000
## 337  5.231100  5.000000 224.0000 20.20000 359.0626  9.80000 19.50000
## 338  5.615000  5.000000 224.0000 20.20000 394.8100 10.56000 18.50000
## 339  3.892916  5.000000 224.0000 20.20000 361.5256  8.51000 20.60000
## 340  4.812200  8.762074 224.0000 20.20000 396.9000  9.74000 19.00000
## 341  4.812200  5.000000 224.0000 20.20000 396.9000  9.29000 18.70000
## 342  7.037900  1.000000 284.0000 15.50000 394.7400 12.18728 23.38614
```

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## 343  6.266900  1.000000 422.0000 15.90000 360.4947  8.65000 22.27326
## 344  5.732100  5.000000 370.0000 18.35427 396.9000  7.18000 23.90000
## 345  6.465400  5.000000 370.0000 17.60000 387.9700  4.61000 31.20000
## 346  8.013600  3.000000 352.0000 18.80000 385.6400 10.53000 17.50000
## 347  8.013600  3.000000 352.0000 18.80000 364.6100 12.67000 17.20000
## 348  8.535300  4.000000 351.0000 18.35728 392.4300  6.36000 23.10000
## 349  8.344000  4.000000 280.0000 17.00000 390.9400  5.99000 24.50000
## 350  8.792100  1.000000 335.0000 19.70000 389.8500  5.89000 26.60000
## 351  8.792100  1.000000 335.0000 19.70000 396.9000  5.98000 22.90000
## 352  4.625256  4.000000 411.0000 18.30000 370.7800  5.49000 22.54454
## 353 10.710300  4.000000 411.0000 18.52875 392.3300  7.79000 18.60000
## 354 12.126500  5.000000 394.0682 17.00000 384.4600  4.50000 30.10000
## 355 10.585700  4.000000 334.0000 18.76490 382.8000  8.05000 18.20000
## 356 10.585700  4.000000 334.0000 22.00000 376.0400  5.57000 20.60000
## 357  2.122200 24.000000 666.0000 20.20000 377.7300 17.60000 17.80000
## 358  2.505200 24.000000 415.7114 20.20000 391.3400 13.27000 21.70000
## 359  2.722700 24.000000 666.0000 20.20000 395.4300 11.48000 22.70000
## 360  2.509100 24.000000 666.0000 20.20000 390.7400 12.67000 22.60000
## 361  2.518200  9.991885 666.0000 20.20000 374.5600  7.79000 25.00000
## 362  2.295500 24.000000 666.0000 20.20000 350.6500 14.19000 19.90000
## 363  2.103600 24.000000 666.0000 20.20000 380.7900 10.19000 20.80000
## 364  1.904700 24.000000 666.0000 18.48261 353.0400 12.84435 16.80000
## 365  1.904700 24.000000 666.0000 20.20000 354.5500  5.29000 21.90000
## 366  1.613200 24.000000 666.0000 20.20000 354.7000  7.12000 27.50000
## 367  1.752300 24.000000 666.0000 20.20000 316.0300 14.00000 21.90000
## 368  1.510600 24.000000 437.9832 20.20000 131.4200 13.33000 23.10000
## 369  1.332500 24.000000 666.0000 20.20000 375.5200  3.26000 50.00000
## 370  1.356700 10.415793 666.0000 20.20000 375.3300  3.73000 50.00000
## 371  1.202400 24.000000 666.0000 20.20000 392.0500  2.96000 50.00000
## 372  1.169100 24.000000 666.0000 20.20000 366.1500  9.53000 50.00000
## 373  1.129600 24.000000 666.0000 20.20000 347.8800  8.88000 50.00000
## 374  1.174200 24.000000 666.0000 20.20000 396.9000 34.77000 13.80000
## 375  1.137000 24.000000 666.0000 20.20000 396.9000 14.22372 13.80000
## 376  1.316300 24.000000 666.0000 20.20000 396.9000 13.44000 15.00000
## 377  1.344900 24.000000 666.0000 18.50714 363.0200 23.24000 21.24033
## 378  1.358000 24.000000 666.0000 20.20000 396.9000 21.24000 13.30000
## 379  1.386100 24.000000 666.0000 20.20000 363.4567 23.69000 13.10000
## 380  1.386100 24.000000 418.1795 20.20000 393.7400 21.78000 10.20000
## 381  1.416500 24.000000 666.0000 20.20000 349.5039 17.21000 10.40000
## 382  1.519200 24.000000 666.0000 20.20000 396.9000 21.08000 10.90000
## 383  1.580400 24.000000 666.0000 20.20000 396.9000 23.60000 11.30000
## 384  1.533100 24.000000 666.0000 20.20000 396.9000 24.56000 12.30000
## 385  3.598691 11.525802 666.0000 20.20000 285.8300 30.63000  8.80000
## 386  3.428464 24.000000 666.0000 20.20000 396.9000 30.81000  7.20000
## 387  1.467200 24.000000 666.0000 20.20000 396.9000 28.28000 10.50000
## 388  1.518400 24.000000 666.0000 20.20000 396.9000 31.99000  7.40000
## 389  1.589500 24.000000 666.0000 20.20000 372.9200 30.62000 10.20000
## 390  1.728100 24.000000 666.0000 18.53746 396.9000 20.85000 11.50000
## 391  1.926500 24.000000 666.0000 20.20000 394.4300 17.11000 15.10000
## 392  2.167800 24.000000 413.5163 20.20000 378.3800 18.76000 23.20000
## 393  1.770000 24.000000 666.0000 20.20000 396.9000 25.68000  9.70000
## 394  1.791200 24.000000 423.5671 18.50713 396.9000 15.17000 13.80000
## 395  1.782100 24.000000 666.0000 20.20000 396.9000 16.35000 12.70000
## 396  1.725700 10.577764 666.0000 20.20000 391.9800 17.12000 13.10000
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## 397  1.676800 24.000000 666.0000 18.51030 396.9000 19.37000 21.68300
## 398  1.633400 24.000000 666.0000 20.20000 393.1000 19.92000  8.50000
## 399  1.489600 24.000000 666.0000 20.20000 396.9000 30.59000  5.00000
## 400  1.500400 24.000000 666.0000 20.20000 338.1600 29.97000  6.30000
## 401  1.588800 24.000000 666.0000 20.20000 396.9000 26.77000  5.60000
## 402  1.574100 24.000000 412.2283 20.20000 396.9000 20.32000  7.20000
## 403  1.639000 10.155877 666.0000 18.59753 376.1100 20.31000 12.10000
## 404  1.702800 24.000000 666.0000 20.20000 396.9000 19.77000  8.30000
## 405  1.607400 24.000000 666.0000 20.20000 329.4600 27.38000  8.50000
## 406  1.425400 24.000000 666.0000 20.20000 348.7648 22.98000  5.00000
## 407  1.178100 24.000000 666.0000 20.20000 370.2200 23.34000 11.90000
## 408  1.285200 24.000000 666.0000 20.20000 357.1971 12.13000 27.90000
## 409  3.534101 24.000000 666.0000 20.20000 314.6400 26.40000 17.20000
## 410  1.465500 24.000000 666.0000 20.20000 179.3600 12.44345 27.50000
## 411  1.413000 24.000000 666.0000 18.49476   2.6000 10.11000 15.00000
## 412  1.527500 24.000000 666.0000 18.48725  35.0500 21.22000 17.20000
## 413  1.553900 24.000000 666.0000 20.20000  28.7900 34.37000 17.90000
## 414  1.589400 24.000000 666.0000 20.20000 210.9700 20.08000 16.30000
## 415  1.658200 24.000000 666.0000 20.20000  88.2700 36.98000  7.00000
## 416  1.834700 24.000000 666.0000 20.20000  27.2500 29.05000  7.20000
## 417  3.575141 24.000000 666.0000 20.20000  21.5700 25.79000  7.50000
## 418  1.647500 24.000000 666.0000 20.20000 127.3600 26.64000 10.40000
## 419  1.802600 24.000000 666.0000 18.50620  16.4500 20.62000  8.80000
## 420  1.794000 24.000000 413.5573 20.20000  48.4500 22.74000  8.40000
## 421  1.858900 24.000000 666.0000 20.20000 318.7500 15.02000 16.70000
## 422  1.874600 24.000000 666.0000 20.20000 319.9800 15.70000 14.20000
## 423  1.951200 24.000000 666.0000 20.20000 346.5528 14.10000 20.80000
## 424  2.021800 24.000000 666.0000 20.20000 351.9529 13.08543 13.40000
## 425  2.063500 24.000000 666.0000 20.20000   3.6500 17.16000 11.70000
## 426  1.909600 10.297622 423.9679 20.20000   7.6800 24.39000  8.30000
## 427  1.997600 24.000000 666.0000 20.20000  24.6500 15.69000 21.56036
## 428  1.862900 24.000000 666.0000 20.20000  18.8200 14.52000 10.90000
## 429  1.935600 24.000000 666.0000 20.20000  96.7300 21.52000 11.00000
## 430  1.968200 24.000000 666.0000 20.20000  60.7200 24.08000  9.50000
## 431  2.052700 24.000000 666.0000 18.50117  83.4500 17.64000 14.50000
## 432  2.088200 24.000000 666.0000 20.20000  81.3300 19.69000 14.10000
## 433  2.200400 24.000000 666.0000 20.20000  97.9500 12.03000 16.10000
## 434  2.315800 24.000000 666.0000 20.20000 100.1900 16.22000 14.30000
## 435  2.222200 24.000000 429.1455 20.20000 100.6300 15.17000 11.70000
## 436  2.124700 10.658295 666.0000 20.20000 347.4660 23.27000 13.40000
## 437  2.002600 24.000000 666.0000 20.20000  27.4900 18.05000 21.08837
## 438  1.914200 24.000000 666.0000 20.20000   9.3200 26.45000  8.70000
## 439  3.573848 24.000000 666.0000 20.20000  68.9500 34.02000  8.40000
## 440  1.817200 24.000000 418.2245 18.57078 396.9000 22.88000 12.80000
## 441  1.866200 24.000000 666.0000 20.20000 391.4500 22.11000 10.50000
## 442  2.065100 10.283184 666.0000 20.20000 385.9600 19.52000 17.10000
## 443  2.004800 24.000000 666.0000 20.20000 395.6900 16.59000 18.40000
## 444  1.978400 24.000000 415.0443 20.20000 386.7300 18.85000 21.15752
## 445  1.895600 24.000000 666.0000 20.20000 240.5200 23.79000 10.80000
## 446  1.987900 24.000000 666.0000 20.20000  43.0600 23.98000 11.80000
## 447  2.072000 24.000000 666.0000 20.20000 318.0100 17.79000 14.90000
## 448  3.612964 24.000000 666.0000 20.20000 353.0601 16.44000 12.60000
## 449  2.261600  9.851689 666.0000 20.20000 396.9000 18.13000 14.10000
## 450  2.185000 24.000000 666.0000 20.20000 304.2100 19.31000 13.00000
```

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## 451  2.323600 24.000000 416.3155 18.44464   0.3200 17.44000 13.40000
## 452  2.355200 24.000000 666.0000 20.20000 355.2900 17.73000 15.20000
## 453  2.368200 24.000000 666.0000 20.20000 385.0900 17.27000 16.10000
## 454  2.452700 24.000000 666.0000 20.20000 375.8700 12.97052 17.80000
## 455  2.496100 24.000000 666.0000 20.20000   6.6800 18.71000 14.90000
## 456  2.435800 10.688273 414.0355 20.20000  50.9200 18.13000 14.10000
## 457  2.580600 24.000000 666.0000 20.20000 355.7973 19.01000 12.70000
## 458  2.779200 24.000000 410.9571 18.45708 353.6011 16.94000 13.50000
## 459  2.783100 24.000000 666.0000 20.20000 272.2100 16.23000 14.90000
## 460  2.717500 24.000000 666.0000 20.20000 396.9000 14.70000 20.00000
## 461  2.597500 24.000000 427.9356 20.20000 255.2300 16.42000 16.40000
## 462  2.567100 24.000000 666.0000 20.20000 391.4300 14.65000 17.70000
## 463  2.734400 24.000000 423.9924 20.20000 396.9000 13.99000 19.50000
## 464  3.578369 10.185831 666.0000 20.20000 393.8200 12.89726 20.20000
## 465  2.963400 24.000000 666.0000 20.20000 396.9000 12.92207 21.40000
## 466  3.066500 24.000000 666.0000 20.20000 334.4000 14.13000 19.90000
## 467  2.871500 10.192550 416.7639 20.20000  22.0100 17.15000 19.00000
## 468  2.540300 24.000000 425.3689 20.20000 331.2900 21.32000 19.10000
## 469  2.908400 24.000000 422.5489 20.20000 368.7400 18.13000 21.95489
## 470  3.545640 24.000000 666.0000 18.59763 396.9000 14.76000 20.10000
## 471  3.661716 10.258152 666.0000 20.20000 396.9000 16.29000 19.90000
## 472  3.099300 24.000000 666.0000 20.20000 395.3300 12.87000 19.60000
## 473  2.896500 24.000000 666.0000 20.20000 393.3700 14.36000 23.20000
## 474  2.532900 24.000000 666.0000 20.20000 374.6800 11.66000 29.80000
## 475  2.429800 24.000000 427.4317 18.47912 348.0906 18.14000 13.80000
## 476  2.206000 10.587617 666.0000 20.20000 302.7600 24.10000 13.30000
## 477  2.305300 24.000000 666.0000 20.20000 396.2100 18.68000 16.70000
## 478  2.100700 24.000000 666.0000 20.20000 349.4800 13.23811 12.00000
## 479  2.170500 24.000000 666.0000 20.20000 379.7000 18.03000 21.43717
## 480  1.951200 10.190889 666.0000 18.56093 383.3200 13.11000 21.40000
## 481  3.424200 24.000000 666.0000 18.64616 396.9000 10.74000 23.00000
## 482  3.331700 24.000000 666.0000 20.20000 393.0700  7.74000 23.70000
## 483  3.410600 24.000000 666.0000 18.53118 395.2800  7.01000 25.00000
## 484  4.098300 24.000000 666.0000 20.20000 392.9200 10.42000 21.80000
## 485  3.724000 24.000000 666.0000 20.20000 370.7300 13.34000 20.60000
## 486  3.991700 24.000000 428.5031 20.20000 388.6200 10.58000 21.20000
## 487  3.545900 24.000000 666.0000 20.20000 392.6800 14.98000 19.10000
## 488  3.717866 24.000000 666.0000 20.20000 388.2200 11.45000 20.60000
## 489  1.820900  4.000000 711.0000 20.10000 395.0900 13.14964 15.20000
## 490  1.755400  4.000000 438.0126 20.10000 344.0500 23.97000  7.00000
## 491  1.822600  4.000000 711.0000 20.10000 318.4300 13.02672  8.10000
## 492  1.868100  4.000000 711.0000 20.10000 390.1100 18.07000 13.60000
## 493  3.626337  4.000000 711.0000 20.10000 396.9000 13.35000 20.10000
## 494  2.381700  6.000000 391.0000 19.20000 396.9000 12.01000 21.80000
## 495  2.381700  6.000000 391.0000 19.20000 396.9000 13.59000 24.50000
## 496  2.798600  6.000000 391.0000 19.20000 393.2900 17.60000 22.16345
## 497  2.798600  6.000000 403.0549 18.46061 396.9000 21.14000 19.70000
## 498  2.892700  6.000000 391.0000 19.20000 396.9000 14.10000 18.30000
## 499  2.409100  6.000000 391.0000 19.20000 396.9000 12.92000 21.20000
## 500  2.399900  8.861412 391.0000 19.20000 395.7700 15.10000 17.50000
## 501  2.498200  6.000000 391.0000 19.20000 396.9000 14.33000 16.80000
## 502  2.478600  8.424942 273.0000 21.00000 391.9900  9.67000 22.40000
## 503  2.287500  1.000000 273.0000 21.00000 396.9000  9.08000 20.60000
## 504  2.167500  1.000000 395.0967 21.00000 396.9000  5.64000 23.90000
```

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## 505  2.388900  1.000000 273.0000 21.00000 393.4500  6.48000 22.00000
## 506  2.505000  1.000000 273.0000 21.00000 396.9000  7.88000 11.90000
```