

# Data Cleaning

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## Introduction

Package to deal with missing data

- mice
- Amelia
- missForest
- Hmisc
- mi

Process of data cleaning

- Manage missing data
- Manage inconsistent data
- Manage outliers

## Manage missing data

### Identify missing data

```
mdata = read.csv('./Data/Mdata.csv', sep = ';')
head(mdata)
```

```
##      X      crim zn  indus chas   nox    rm  age    dis rad tax ptratio    b lstat
## 1 1      NA 18   2.31    0 0.538 6.575 65.2 4.0900   1 296   15.3 396.90  4.98
## 2 2 0.02731 0   7.07    0 0.469 6.421 78.9 4.9671   2 242   17.8 396.90  9.14
## 3 3 0.02729 0   7.07    0 0.469 7.185 61.1 4.9671   2 242   17.8 392.83  4.03
## 4 4 0.03237 0    NA    0 0.458 6.998 45.8 6.0622   3 222   18.7 394.63  2.94
## 5 5 0.06905 0   2.18    0 0.458 7.147 54.2 6.0622   3 222   18.7 396.90  5.33
## 6 6      NA 0   2.18    0 0.458 6.430 58.7 6.0622   3 222   18.7 394.12  5.21
##   medv
## 1 24.0
## 2 21.6
## 3 34.7
## 4 33.4
## 5 36.2
## 6 28.7
```

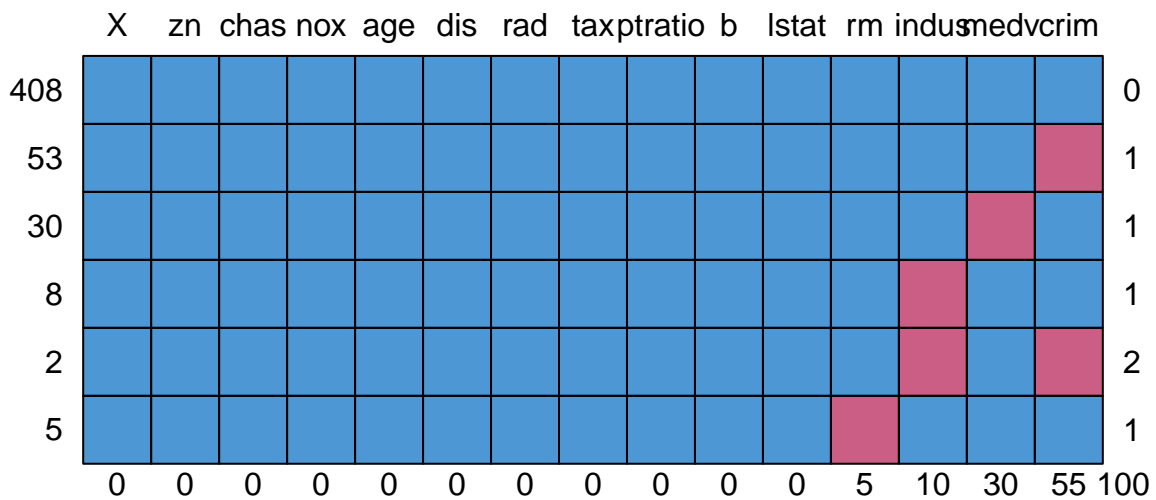
```
library(mice)
```

```
##
## Attaching package: 'mice'

## The following object is masked from 'package:stats':
##
## filter

## The following objects are masked from 'package:base':
##
## cbind, rbind
```

```
md.pattern(mdata)
```



```
##      X zn chas nox age dis rad tax ptratio b lstat rm indus medv crim
## 408 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0
## 53 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1
## 30 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
## 8 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1
## 2 1 1 1 1 1 1 1 1 1 1 1 0 1 0 2
## 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
## 0 0 0 0 0 0 0 0 0 0 0 5 10 30 55 100
```

## Remove missing data

This technique might only be appropriate when the number of missing value is small. However, if the number of missing value is large, we might try to impute the data. However, some missing data might not suitable of be estimated according to domain knowledge.

```
head(na.omit(mdata))
```

```
##      X      crim    zn indus chas   nox    rm   age    dis rad tax ptratio    b
## 2    2 0.02731  0.0  7.07    0 0.469 6.421 78.9 4.9671  2 242    17.8 396.90
## 3    3 0.02729  0.0  7.07    0 0.469 7.185 61.1 4.9671  2 242    17.8 392.83
## 5    5 0.06905  0.0  2.18    0 0.458 7.147 54.2 6.0622  3 222    18.7 396.90
## 7    7 0.08829 12.5  7.87    0 0.524 6.012 66.6 5.5605  5 311    15.2 395.60
## 11   11 0.22489 12.5  7.87    0 0.524 6.377 94.3 6.3467  5 311    15.2 392.52
## 12   12 0.11747 12.5  7.87    0 0.524 6.009 82.9 6.2267  5 311    15.2 396.90
##      lstat medv
## 2    9.14 21.6
## 3    4.03 34.7
## 5    5.33 36.2
## 7   12.43 22.9
## 11  20.45 15.0
## 12  13.27 18.9
```

```
# alternative way to filter only data without any missing value
```

```
head(mdata[complete.cases(mdata), ])
```

```
##      X      crim    zn indus chas   nox    rm   age    dis rad tax ptratio    b
## 2    2 0.02731  0.0  7.07    0 0.469 6.421 78.9 4.9671  2 242    17.8 396.90
## 3    3 0.02729  0.0  7.07    0 0.469 7.185 61.1 4.9671  2 242    17.8 392.83
## 5    5 0.06905  0.0  2.18    0 0.458 7.147 54.2 6.0622  3 222    18.7 396.90
## 7    7 0.08829 12.5  7.87    0 0.524 6.012 66.6 5.5605  5 311    15.2 395.60
## 11   11 0.22489 12.5  7.87    0 0.524 6.377 94.3 6.3467  5 311    15.2 392.52
## 12   12 0.11747 12.5  7.87    0 0.524 6.009 82.9 6.2267  5 311    15.2 396.90
##      lstat medv
## 2    9.14 21.6
## 3    4.03 34.7
## 5    5.33 36.2
## 7   12.43 22.9
## 11  20.45 15.0
## 12  13.27 18.9
```

```
# see all rows of data with missing value in at least one of its attribute
```

```
head(mdata[!complete.cases(mdata), ])
```

```
##      X      crim    zn indus chas   nox    rm   age    dis rad tax ptratio    b
## 1    1         NA 18.0  2.31    0 0.538 6.575 65.2 4.0900  1 296    15.3 396.90
## 4    4 0.03237  0.0    NA    0 0.458 6.998 45.8 6.0622  3 222    18.7 394.63
## 6    6         NA  0.0  2.18    0 0.458 6.430 58.7 6.0622  3 222    18.7 394.12
## 8    8 0.14455 12.5  7.87    0 0.524 6.172 96.1 5.9505  5 311    15.2 396.90
## 9    9         NA 12.5  7.87    0 0.524 5.631 100.0 6.0821  5 311    15.2 386.63
## 10   10 0.17004 12.5  7.87    0 0.524 6.004 85.9 6.5921  5 311    15.2 386.71
##      lstat medv
```

```
## 1 4.98 24.0
## 4 2.94 33.4
## 6 5.21 28.7
## 8 19.15 NA
## 9 29.93 16.5
## 10 17.10 NA
```

## Fill in manually

This technique also require domain knowledge

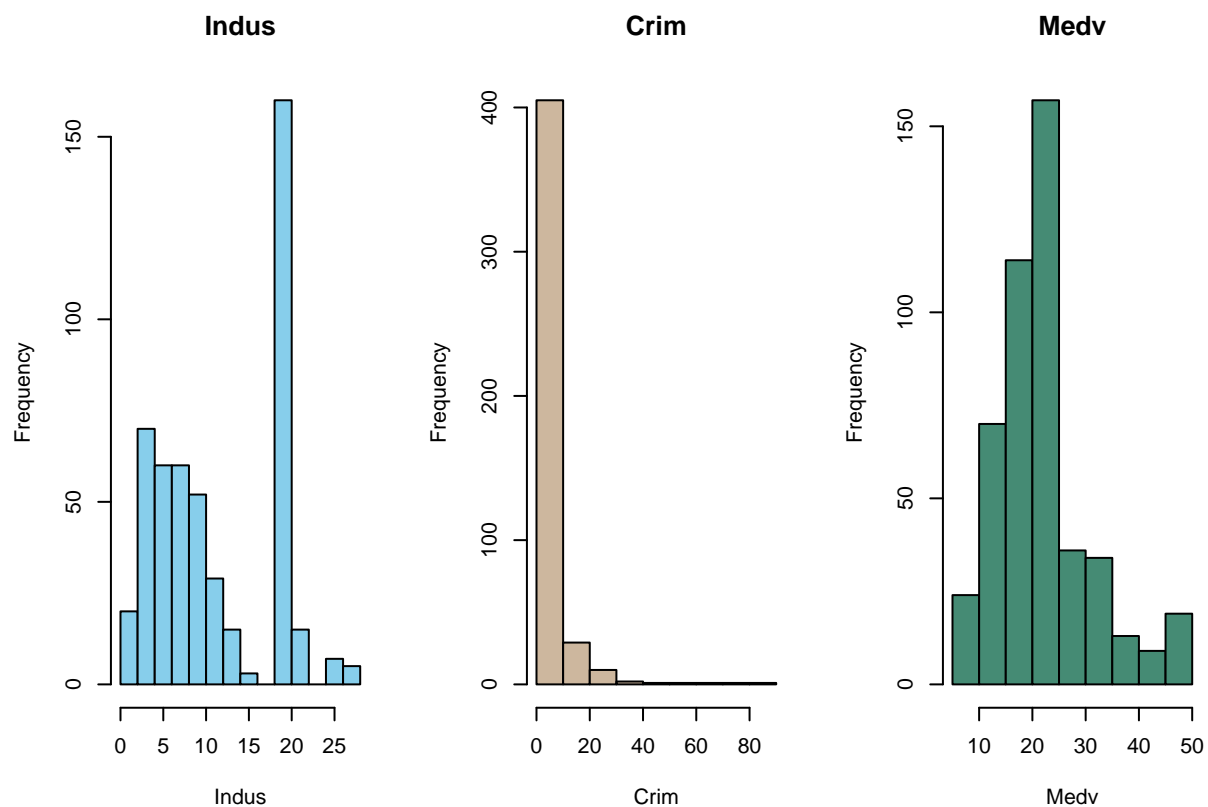
```
head(edit(mdata))
```

```
##      X      crim zn indus chas   nox    rm  age    dis rad tax ptratio      b lstat
## 1 1      NA 18  2.31    0 0.538 6.575 65.2 4.0900   1 296    15.3 396.90 4.98
## 2 2 0.02731  0  7.07    0 0.469 6.421 78.9 4.9671   2 242    17.8 396.90 9.14
## 3 3 0.02729  0  7.07    0 0.469 7.185 61.1 4.9671   2 242    17.8 392.83 4.03
## 4 4 0.03237  0   NA    0 0.458 6.998 45.8 6.0622   3 222    18.7 394.63 2.94
## 5 5 0.06905  0  2.18    0 0.458 7.147 54.2 6.0622   3 222    18.7 396.90 5.33
## 6 6      NA  0  2.18    0 0.458 6.430 58.7 6.0622   3 222    18.7 394.12 5.21
##   medv
## 1 24.0
## 2 21.6
## 3 34.7
## 4 33.4
## 5 36.2
## 6 28.7
```

## Impute using centralized metric

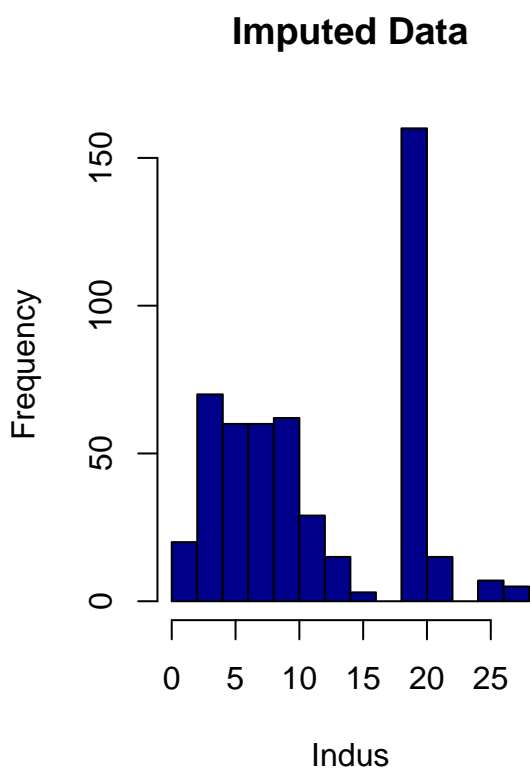
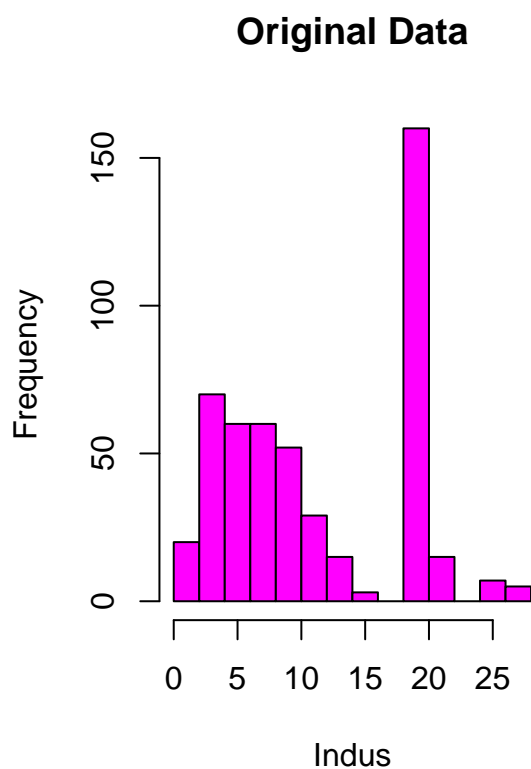
- mean : normal data
- median : skewed data
- mode : categorical data

```
par(mfrow=c(1,3))
hist(mdata$indus, col = 'skyblue', main = 'Indus', xlab = 'Indus')
hist(mdata$crim, col = 'bisque3', main = 'Crim', xlab = 'Crim')
hist(mdata$medv, col = 'aquamarine4', main = 'Medv', xlab = 'Medv')
```



```
# impute using median of the centralized metric
indus_imp = ifelse(is.na(mdata$indus), median(mdata$indus, na.rm = T), mdata$indus)

# compare the data distribution before and after imputation
par(mfrow=c(1,2))
hist(mdata$indus, col = 'magenta', main = 'Original Data', xlab = 'Indus')
hist(indus_imp, col = 'darkblue', main = 'Imputed Data', xlab = 'Indus')
```



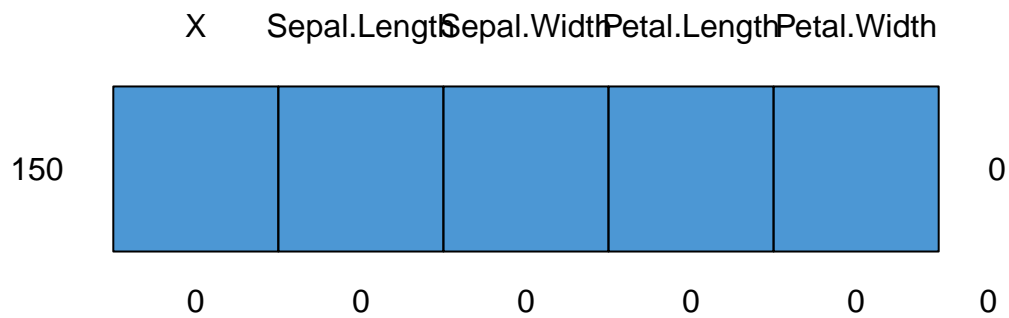
## k-nearest neighbor

```
iris.mis1 = read.csv('./Data/iris.mis1.csv')
head(iris.mis1)
```

```
##   X Sepal.Length Sepal.Width Petal.Length Petal.Width
## 1 1          NA          3.5          1.4          0.2
## 2 2          4.9          3.0          1.4          0.2
## 3 3          4.7          NA          1.3          0.2
## 4 4          4.6          3.1          1.5          NA
## 5 5          5.0          3.6          1.4          0.2
## 6 6          5.4          3.9          1.7          0.4
```

```
library(multiUS)
iris_knn = KNNimp(iris.mis1, k = 10)
md.pattern(iris_knn)
```

```
##  /\      /\
## { '---' }
## { 0  0 }
## ==> V <== No need for mice. This data set is completely observed.
##  \  \ /  /
##   '-----'
```



```
##      X Sepal.Length Sepal.Width Petal.Length Petal.Width
## 150 1             1             1             1             1 0
##      0             0             0             0             0 0
```

## Statistical imputation

```
airquality = read.table('./Data/airquality.txt')
head(airquality)
```

```
##      Ozone Solar.R Wind Temp Month Day
## 1      41      190  7.4   67     5   1
## 2      36      118  8.0   72     5   2
## 3      12      149 12.6   74     5   3
## 4      18      313 11.5   62     5   4
## 5      NA       NA 14.3   56     5   5
## 6      28       NA 14.9   66     5   6
```

```
# predictive mean matching
air.pmm = mice(airquality, m = 5, meth = 'pmm')
```

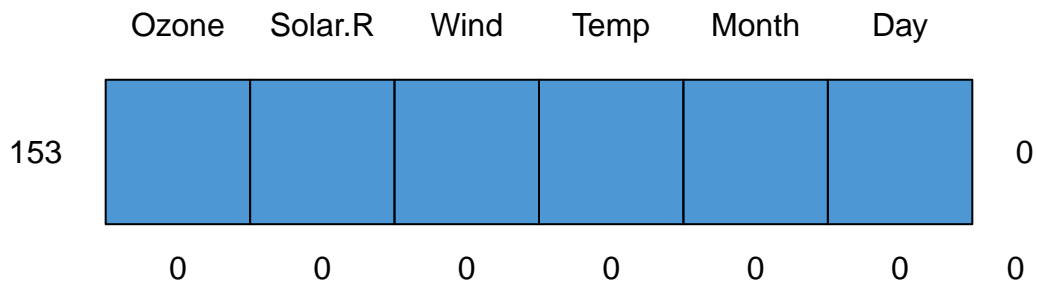
```
##
## iter imp variable
```



```
## 1 1 Ozone Solar.R
## 1 2 Ozone Solar.R
## 1 3 Ozone Solar.R
## 1 4 Ozone Solar.R
## 1 5 Ozone Solar.R
## 2 1 Ozone Solar.R
## 2 2 Ozone Solar.R
## 2 3 Ozone Solar.R
## 2 4 Ozone Solar.R
## 2 5 Ozone Solar.R
## 3 1 Ozone Solar.R
## 3 2 Ozone Solar.R
## 3 3 Ozone Solar.R
## 3 4 Ozone Solar.R
## 3 5 Ozone Solar.R
## 4 1 Ozone Solar.R
## 4 2 Ozone Solar.R
## 4 3 Ozone Solar.R
## 4 4 Ozone Solar.R
## 4 5 Ozone Solar.R
## 5 1 Ozone Solar.R
## 5 2 Ozone Solar.R
## 5 3 Ozone Solar.R
## 5 4 Ozone Solar.R
## 5 5 Ozone Solar.R
```

```
md.pattern(complete(air.pmm))
```

```
## /\      /\
## { '---' }
## { 0    0 }
## ==> V <== No need for mice. This data set is completely observed.
## \  \|/  /
## '-----'
```



```
##      Ozone Solar.R Wind Temp Month Day
## 153      1       1   1   1     1   1 0
##       0       0   0   0     0   0 0
```

## Manage inconsistent data

Identify inconsistent data

Domain knowledge

## Manage outliers

Detect outliers

Univariate

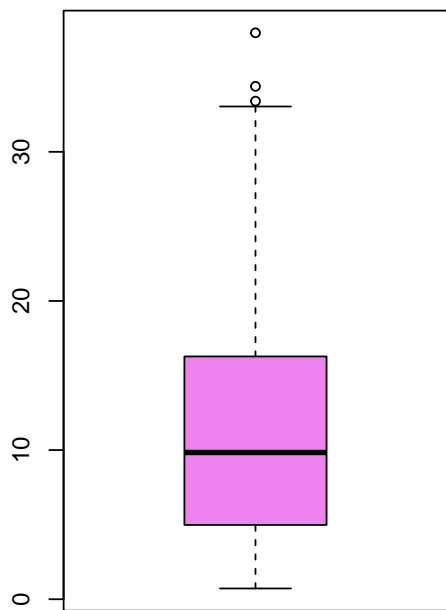
```
ozone3 = read.csv('./Data/ozone3.csv')
head(ozone3)
```

```
##      Month Day_of_month Day_of_week ozone_reading pressure_height Wind_speed
## 1         1             1           4           3.01           5480           8
```

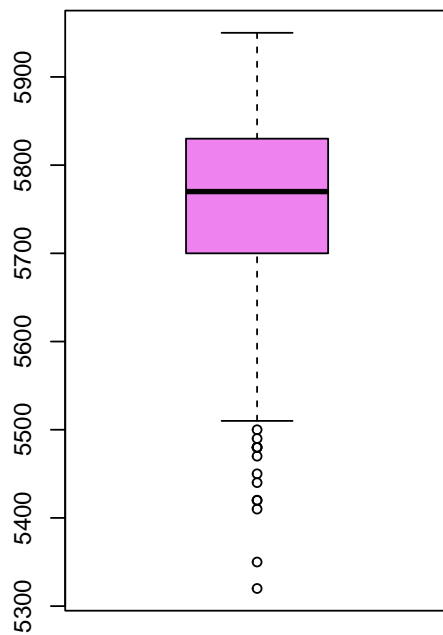
```
## 2      1      2      5      3.20      5660      6
## 3      1      3      6      2.70      5710      4
## 4      1      4      7      5.18      5700      3
## 5      1      5      1      5.34      5760      3
## 6      1      6      2      5.77      5720      4
## Humidity Temperature_Sandburg Temperature_ElMonte Inversion_base_height
## 1      20      30      32.54      5000
## 2      32      38      41.36      1601
## 3      28      40      38.12      2693
## 4      37      45      47.12      590
## 5      51      54      45.32      1450
## 6      69      35      49.64      1568
## Pressure_gradient Inversion_temperature Visibility
## 1      -15      30.56      200
## 2      -14      46.94      300
## 3      -25      47.66      250
## 4      -24      55.04      100
## 5      25      57.02      60
## 6      15      53.78      60
```

```
par(mfrow=c(2,2))
boxplot(ozone3$ozone_reading, main = 'Ozone Reading', col = 'violet')
boxplot(ozone3$pressure_height, main = 'Pressure Height', col = 'violet')
boxplot(ozone3$Wind_speed, main = 'Wind speed', col = 'violet')
boxplot(ozone3$Humidity, main = 'Humidity', col = 'violet')
```

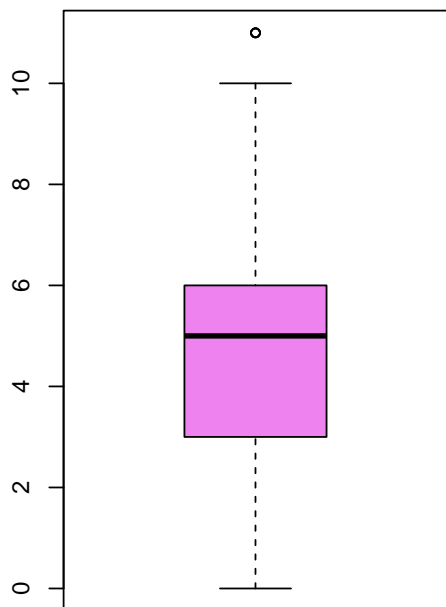
**Ozone Reading**



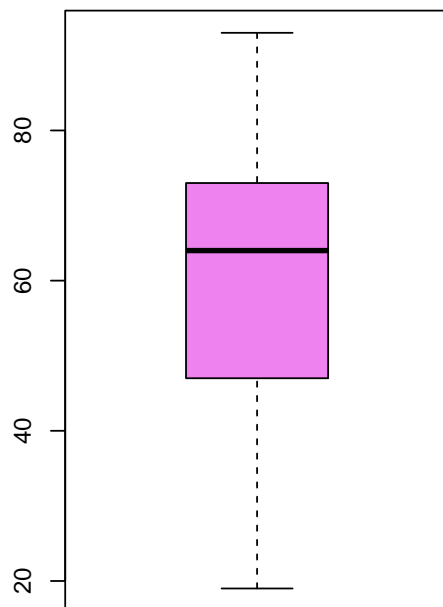
**Pressure Height**



**Wind speed**



**Humidity**



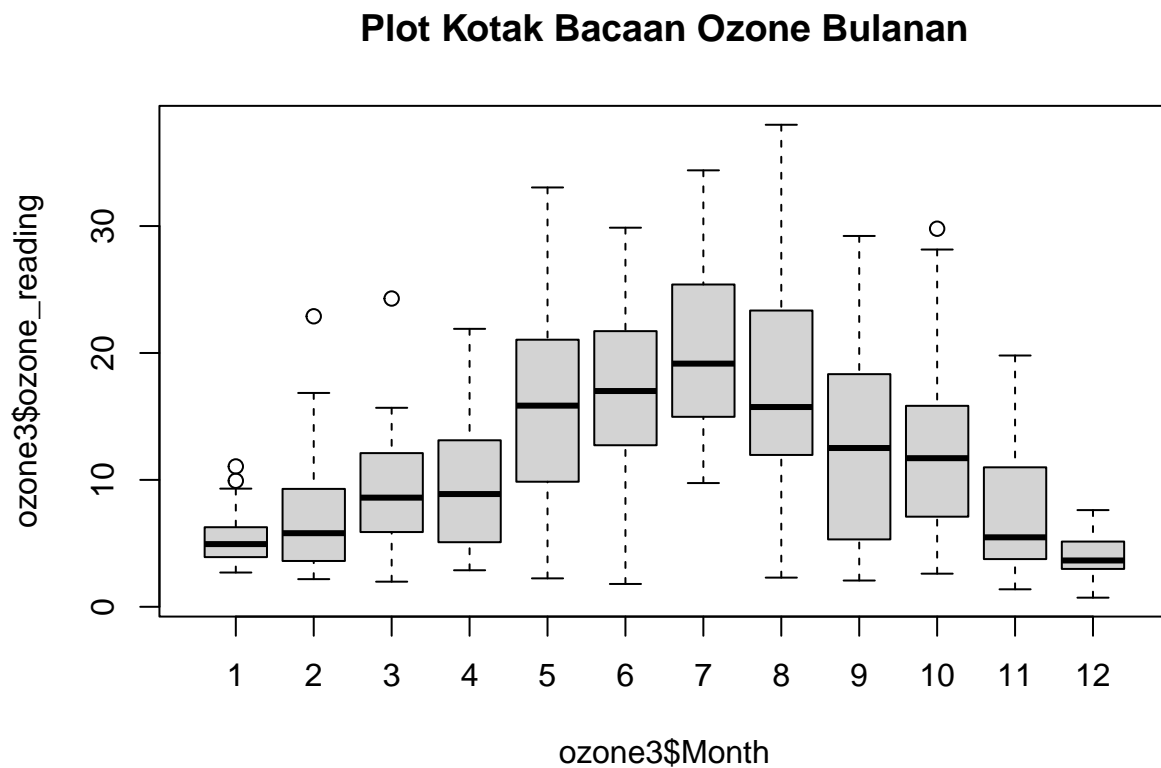
```
# list out all the outlier
boxplot.stats(ozone3$ozone_reading)$out
```

```
## [1] 34.39 33.40 37.98
```

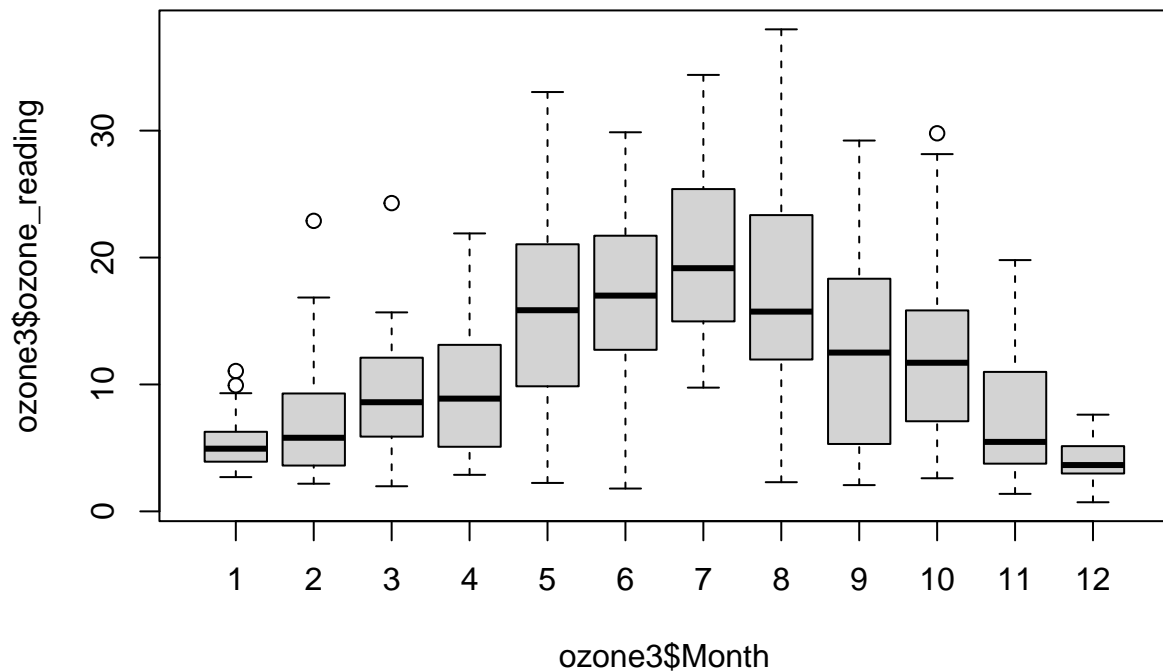
```
# find the row index for data that contain outlier
out = which(ozone3$ozone_reading %in% boxplot.stats(ozone3$ozone_reading)$out)
```

## Bivariate

```
boxplot(ozone3$ozone_reading~ozone3$Month,
        main = "Plot Kotak Bacaan Ozone Bulanan")
```



```
boxplot(ozone3$ozone_reading~ozone3$Month)$out
```



```
## [1] 11.06  9.93 22.89 24.29 29.79
```

### Multivariate (supervised)

Cook's distance

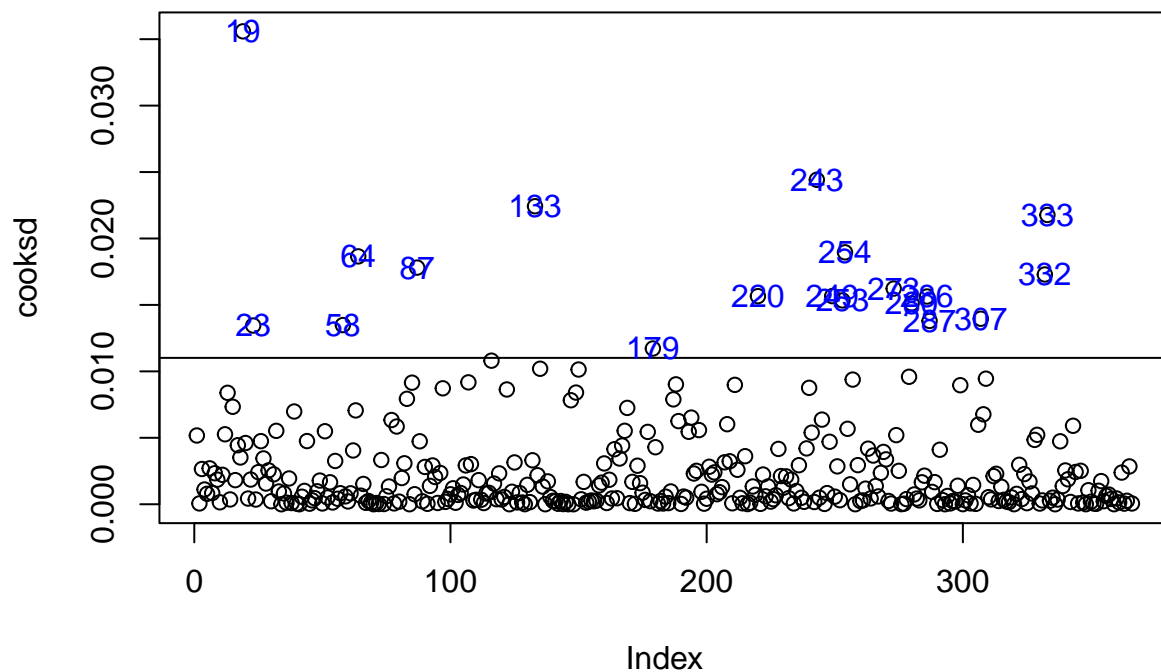
```
model = lm(ozone_reading~., data = ozone3)

cooks = cooks.distance(model)

plot(cooks)

min.cook = 4 * mean(cooks)

abline(h=min.cook)
text(x=1:length(cooks), y = cooks, labels = ifelse(cooks > min.cook,
                                                    names(cooks), ''),
      col = 'blue')
```



Mahalanobis

```
datamus = read.csv('./Data/dataMus.csv')
head(datamus)
```

```
##           x1           x2           x3
## 1 6.370958 12.401931  8.997212
## 2 4.435302 12.089502 16.001332
## 3 5.363128  7.993583 18.513975
## 4 5.632863 13.696964 21.178618
## 5 5.404268  8.666453 10.869415
## 6 4.893875 10.211028 11.547433
```

```
mahalanobis(datamus, colMeans(datamus), cov(datamus))
```

```
## [1] 6.6613197 1.9376688 2.8841248 4.3272708 1.4937202 1.1645305
## [7] 1.8975290 0.7746887 2.4258948 0.1120629 2.1181384 5.1201061
## [13] 1.0707656 0.1273856 3.0873265 0.3716272 0.1220753 16.8756814
## [19] 2.9788606 2.3718872 2.2753179 1.9602572 0.3473106 2.6001648
## [25] 1.8075732 0.1154253 0.6850105 3.1947572 1.5310273 1.7723285
## [31] 0.5422669 1.5005142 1.7623100 2.7551368 2.4316280 1.4581411
## [37] 2.1736195 2.9769254 3.2471266 0.6581468 0.3930833 1.9864225
## [43] 2.0762697 1.8585489 1.8399259 3.2239560 1.6791342 1.4535708
## [49] 1.2073039 1.6596203 0.9777444 1.8755226 3.9749969 0.3304041
```

```
## [55] 1.9192245 1.5733724 0.6594109 0.5468030 4.6491092 2.2435083
## [61] 0.8866919 2.4759963 0.1968560 3.9142876 1.2045114 1.8864418
## [67] 2.0446587 0.6076744 6.5999883 0.8140921 1.0834970 0.9893252
## [73] 3.7180556 4.7897579 1.8301339 1.6152388 3.3115055 2.2450332
## [79] 2.5609819 2.2589389 1.3241417 1.9367423 0.5978505 0.4737662
## [85] 0.8125560 2.5341391 4.8180660 1.3477468 4.0640007 3.6355903
## [91] 1.3970220 0.4559532 0.8904617 8.8071737 0.8332572 3.0479471
## [97] 1.4808214 2.9483067 3.6562729 2.5057120 44.2446681 19.6542772
## [103] 19.6542772
```

Multivariate (unsupervised)

## Treating outliers

Error

Actual data

## Data Cleaning

Data cleaning involves in dealing with:

1. Missing data
2. Inconsistent data
3. Outlier

There are several method to deal with missing data such as:

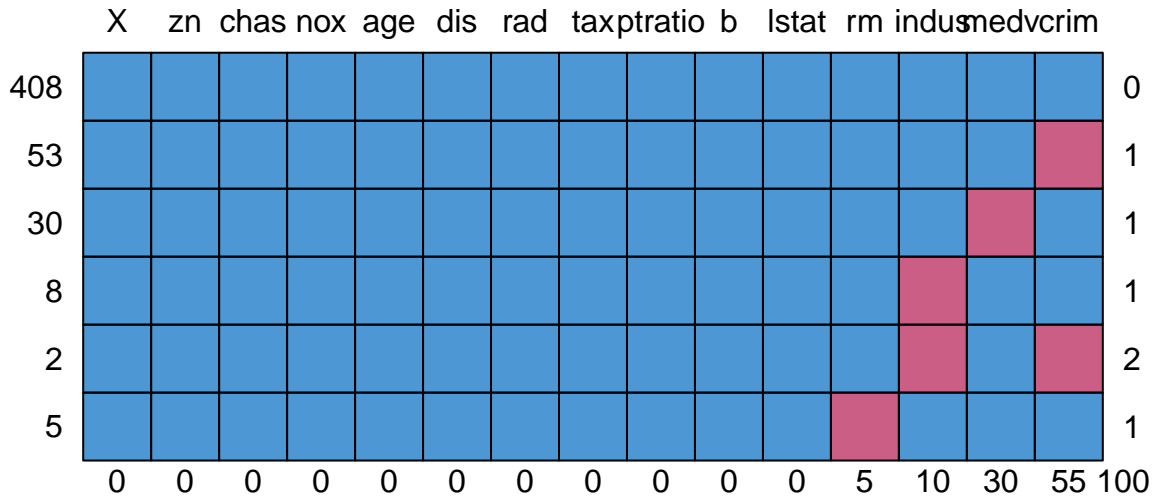
1. Identify pattern
2. Remove missing data
3. Fill manually
4. Use centralized metric
5. K-Nearest Neighbor
6. Statistical imputation

```
library(mice)
mdata = read.csv('./Data/MData.csv', sep=';')
head(mdata)
```

```
##      X      crim zn indus chas   nox    rm  age    dis rad tax ptratio    b lstat
## 1 1      NA 18   2.31    0 0.538 6.575 65.2 4.0900   1 296    15.3 396.90 4.98
## 2 2 0.02731 0   7.07    0 0.469 6.421 78.9 4.9671   2 242    17.8 396.90 9.14
## 3 3 0.02729 0   7.07    0 0.469 7.185 61.1 4.9671   2 242    17.8 392.83 4.03
## 4 4 0.03237 0    NA    0 0.458 6.998 45.8 6.0622   3 222    18.7 394.63 2.94
## 5 5 0.06905 0   2.18    0 0.458 7.147 54.2 6.0622   3 222    18.7 396.90 5.33
## 6 6      NA 0   2.18    0 0.458 6.430 58.7 6.0622   3 222    18.7 394.12 5.21
##      medv
## 1 24.0
## 2 21.6
## 3 34.7
## 4 33.4
## 5 36.2
## 6 28.7
```



```
md.pattern(mdata)
```



```
##      X zn chas nox age dis rad tax ptratio b lstat rm indus medv crim
## 408 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0
## 53 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1
## 30 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
## 8 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1
## 2 1 1 1 1 1 1 1 1 1 1 1 0 1 0 2
## 5 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1
##    0 0 0 0 0 0 0 0 0 0 0 5 10 30 55 100
```

Remove rows that contain missing value.

```
mdata2 = mdata[complete.cases(mdata),]
mdata[!complete.cases(mdata),]
```

```
##      X      crim  zn indus chas  nox  rm  age  dis rad tax ptratio
## 1      1      NA 18.0  2.31   0 0.5380 6.575 65.2 4.0900 1 296 15.3
## 4      4 0.03237 0.0   NA   0 0.4580 6.998 45.8 6.0622 3 222 18.7
## 6      6      NA 0.0  2.18   0 0.4580 6.430 58.7 6.0622 3 222 18.7
## 8      8 0.14455 12.5 7.87   0 0.5240 6.172 96.1 5.9505 5 311 15.2
## 9      9      NA 12.5 7.87   0 0.5240 5.631 100.0 6.0821 5 311 15.2
## 10     10 0.17004 12.5 7.87   0 0.5240 6.004 85.9 6.5921 5 311 15.2
## 14     14      NA 0.0  8.14   0 0.5380 5.949 61.8 4.7075 4 307 21.0
```

##	22	22	NA	0.0	8.14	0	0.5380	5.965	89.2	4.0123	4	307	21.0
##	24	24	0.98843	0.0	8.14	0	0.5380	5.813	100.0	4.0952	4	307	21.0
##	36	36	NA	0.0	5.96	0	0.4990	5.933	68.2	3.3603	5	279	19.2
##	41	41	0.03359	75.0	2.95	0	0.4280	7.024	15.8	5.4011	3	252	18.3
##	47	47	0.18836	0.0	6.91	0	0.4480	5.786	33.3	5.1004	3	233	17.9
##	48	48	0.22927	0.0	6.91	0	0.4480	NA	85.5	5.6894	3	233	17.9
##	55	55	NA	75.0	4.00	0	0.4100	5.888	47.6	7.3197	3	469	21.1
##	56	56	0.01311	90.0	1.22	0	0.4030	7.249	21.9	8.6966	5	226	17.9
##	59	59	0.15445	25.0	5.13	0	0.4530	6.145	29.2	7.8148	8	284	19.7
##	61	61	NA	25.0	5.13	0	0.4530	5.741	66.2	7.2254	8	284	19.7
##	66	66	0.03584	80.0	NA	0	0.3980	6.290	17.8	6.6115	4	337	16.1
##	70	70	NA	12.5	6.07	0	0.4090	5.885	33.0	6.4980	4	345	18.9
##	82	82	NA	25.0	4.86	0	0.4260	6.619	70.4	5.4007	4	281	19.0
##	84	84	NA	25.0	4.86	0	0.4260	6.167	46.7	5.4007	4	281	19.0
##	87	87	0.05188	0.0	4.49	0	0.4490	6.015	45.1	4.4272	3	247	18.5
##	88	88	0.07151	0.0	4.49	0	0.4490	6.121	56.8	3.7476	3	247	18.5
##	94	94	NA	28.0	15.04	0	0.4640	6.211	28.9	3.6659	4	270	18.2
##	96	96	NA	0.0	2.89	0	0.4450	6.625	57.8	3.4952	2	276	18.0
##	102	102	0.11432	0.0	8.56	0	0.5200	6.781	71.3	2.8561	5	384	20.9
##	103	103	NA	0.0	8.56	0	0.5200	6.405	85.4	2.7147	5	384	20.9
##	104	104	NA	0.0	8.56	0	0.5200	6.137	87.4	2.7147	5	384	20.9
##	106	106	NA	0.0	8.56	0	0.5200	5.851	96.7	2.1069	5	384	20.9
##	107	107	0.17120	0.0	NA	0	0.5200	5.836	91.9	2.2110	5	384	20.9
##	120	120	0.14476	0.0	10.01	0	0.5470	5.731	65.2	2.7592	6	432	17.8
##	124	124	NA	0.0	25.65	0	0.5810	5.856	97.0	1.9444	2	188	19.1
##	129	129	NA	0.0	21.89	0	0.6240	6.431	98.8	1.8125	4	437	21.2
##	130	130	NA	0.0	21.89	0	0.6240	5.637	94.7	1.9799	4	437	21.2
##	133	133	NA	0.0	21.89	0	0.6240	6.372	97.9	2.3274	4	437	21.2
##	135	135	NA	0.0	21.89	0	0.6240	5.757	98.4	2.3460	4	437	21.2
##	150	150	NA	0.0	19.58	0	0.8710	5.597	94.9	1.5257	5	403	14.7
##	152	152	NA	0.0	19.58	0	0.8710	5.404	100.0	1.5916	5	403	14.7
##	157	157	NA	0.0	19.58	0	0.8710	5.272	94.0	1.7364	5	403	14.7
##	159	159	1.34284	0.0	19.58	0	0.6050	NA	100.0	1.7573	5	403	14.7
##	160	160	NA	0.0	19.58	0	0.8710	6.510	100.0	1.7659	5	403	14.7
##	161	161	1.27346	0.0	19.58	1	0.6050	6.250	92.6	1.7984	5	403	14.7
##	163	163	NA	0.0	19.58	1	0.6050	7.802	98.2	2.0407	5	403	14.7
##	164	164	1.51902	0.0	19.58	1	0.6050	8.375	93.9	2.1620	5	403	14.7
##	171	171	NA	0.0	19.58	0	0.6050	5.875	94.6	2.4259	5	403	14.7
##	174	174	NA	0.0	4.05	0	0.5100	6.416	84.1	2.6463	5	296	16.6
##	181	181	NA	0.0	2.46	0	0.4880	7.765	83.3	2.7410	3	193	17.8
##	182	182	0.06888	0.0	2.46	0	0.4880	6.144	62.2	2.5979	3	193	17.8
##	187	187	0.05602	0.0	NA	0	0.4880	7.831	53.6	3.1992	3	193	17.8
##	196	196	0.01381	80.0	0.46	0	0.4220	7.875	32.0	5.6484	4	255	14.4
##	201	201	NA	95.0	1.47	0	0.4030	7.135	13.9	7.6534	3	402	17.0
##	207	207	NA	0.0	10.59	0	0.4890	6.326	52.5	4.3549	4	277	18.6
##	224	224	0.61470	0.0	NA	0	0.5070	6.618	80.8	3.2721	8	307	17.4
##	225	225	NA	0.0	6.20	0	0.5040	8.266	78.3	2.8944	8	307	17.4
##	243	243	0.10290	30.0	NA	0	0.4280	6.358	52.9	7.0355	6	300	16.6
##	250	250	0.19073	22.0	5.86	0	0.4310	6.718	17.5	7.8265	7	330	19.1
##	258	258	NA	20.0	3.97	0	0.6470	8.704	86.9	1.8010	5	264	13.0
##	266	266	0.76162	20.0	3.97	0	0.6470	5.560	62.8	1.9865	5	264	13.0
##	284	284	0.01501	90.0	1.21	1	0.4010	7.923	24.8	5.8850	1	198	13.6
##	289	289	0.04590	52.5	NA	0	0.4050	6.315	45.6	7.3172	6	293	16.6
##	292	292	0.07886	80.0	4.95	0	0.4110	7.148	27.7	5.1167	4	245	19.2

##	295	295	NA	0.0	13.92	0	0.4370	6.009	42.3	5.5027	4	289	16.0
##	305	305	0.05515	33.0	2.18	0	0.4720	7.236	41.1	4.0220	7	222	18.4
##	310	310	NA	0.0	9.90	0	0.5440	5.972	76.7	3.1025	4	304	18.4
##	311	311	NA	0.0	9.90	0	0.5440	4.973	37.8	2.5194	4	304	18.4
##	319	319	0.40202	0.0	9.90	0	0.5440	6.382	67.2	3.5325	4	304	18.4
##	331	331	0.04544	0.0	3.24	0	0.4600	6.144	32.2	5.8736	4	430	16.9
##	333	333	NA	35.0	NA	0	0.4379	6.031	23.3	6.6407	1	304	16.9
##	334	334	NA	0.0	5.19	0	0.5150	6.316	38.1	6.4584	5	224	20.2
##	336	336	0.03961	0.0	5.19	0	0.5150	6.037	34.5	5.9853	5	224	20.2
##	347	347	NA	0.0	4.39	0	0.4420	5.898	52.3	8.0136	3	352	18.8
##	349	349	NA	80.0	2.01	0	0.4350	6.635	29.7	8.3440	4	280	17.0
##	354	354	0.01709	90.0	2.02	0	0.4100	6.728	36.1	12.1265	5	187	17.0
##	364	364	NA	0.0	18.10	1	0.7700	5.803	89.0	1.9047	24	666	20.2
##	365	365	NA	0.0	18.10	1	0.7180	8.780	82.9	1.9047	24	666	20.2
##	366	366	NA	0.0	18.10	0	0.7180	3.561	87.9	1.6132	24	666	20.2
##	368	368	13.52220	0.0	18.10	0	0.6310	3.863	100.0	1.5106	24	666	20.2
##	372	372	9.23230	0.0	18.10	0	0.6310	NA	100.0	1.1691	24	666	20.2
##	383	383	NA	0.0	18.10	0	0.7000	5.536	100.0	1.5804	24	666	20.2
##	400	400	9.91655	0.0	18.10	0	0.6930	NA	77.8	1.5004	24	666	20.2
##	402	402	NA	0.0	18.10	0	0.6930	6.343	100.0	1.5741	24	666	20.2
##	413	413	18.81100	0.0	NA	0	0.5970	4.628	100.0	1.5539	24	666	20.2
##	415	415	NA	0.0	18.10	0	0.6930	4.519	100.0	1.6582	24	666	20.2
##	418	418	25.94060	0.0	18.10	0	0.6790	5.304	89.1	1.6475	24	666	20.2
##	421	421	NA	0.0	18.10	0	0.7180	6.411	100.0	1.8589	24	666	20.2
##	423	423	NA	0.0	18.10	0	0.6140	5.648	87.6	1.9512	24	666	20.2
##	425	425	8.79212	0.0	18.10	0	0.5840	NA	70.6	2.0635	24	666	20.2
##	435	435	NA	0.0	NA	0	0.7130	6.208	95.0	2.2222	24	666	20.2
##	437	437	NA	0.0	18.10	0	0.7400	6.461	93.3	2.0026	24	666	20.2
##	438	438	NA	0.0	18.10	0	0.7400	6.152	100.0	1.9142	24	666	20.2
##	445	445	NA	0.0	18.10	0	0.7400	5.854	96.6	1.8956	24	666	20.2
##	453	453	NA	0.0	18.10	0	0.7130	6.297	91.8	2.3682	24	666	20.2
##	476	476	6.39312	0.0	18.10	0	0.5840	6.162	97.4	2.2060	24	666	20.2
##	492	492	NA	0.0	27.74	0	0.6090	5.983	98.8	1.8681	4	711	20.1
##	496	496	0.17899	0.0	9.69	0	0.5850	5.670	28.8	2.7986	6	391	19.2
##	497	497	NA	0.0	9.69	0	0.5850	5.390	72.9	2.7986	6	391	19.2
##	499	499	0.23912	0.0	9.69	0	0.5850	6.019	65.3	2.4091	6	391	19.2
##	503	503	0.04527	0.0	11.93	0	0.5730	6.120	76.7	2.2875	1	273	21.0
##	b lstat medv												
##	1	396.90	4.98	24.0									
##	4	394.63	2.94	33.4									
##	6	394.12	5.21	28.7									
##	8	396.90	19.15	NA									
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##	10	386.71	17.10	NA									
##	14	396.90	8.26	20.4									
##	22	392.53	13.83	19.6									
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##	56	395.93	4.81	NA									
##	59	390.68	6.86	NA									

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## 61 395.11 13.15 18.7
## 66 396.90 4.67 23.5
## 70 396.90 8.79 20.9
## 82 395.63 7.22 23.9
## 84 390.64 7.51 22.9
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## 102 395.58 7.67 NA
## 103 70.80 10.63 18.6
## 104 394.47 13.44 19.3
## 106 394.05 16.47 19.5
## 107 395.67 18.66 19.5
## 120 391.50 13.61 NA
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## 129 396.90 15.39 18.0
## 130 396.90 18.34 14.3
## 133 385.76 11.12 23.0
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## 150 351.85 21.45 15.4
## 152 341.60 13.28 19.6
## 157 88.63 16.14 13.1
## 159 353.89 6.43 24.3
## 160 364.31 7.39 23.3
## 161 338.92 5.50 NA
## 163 389.61 1.92 50.0
## 164 388.45 3.32 NA
## 171 292.29 14.43 17.4
## 174 395.50 9.04 23.6
## 181 395.56 7.56 39.8
## 182 396.90 9.45 NA
## 187 392.63 4.45 50.0
## 196 394.23 2.97 NA
## 201 384.30 4.45 32.9
## 207 394.87 10.97 24.4
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## 225 385.05 4.14 44.8
## 243 372.75 11.22 22.2
## 250 393.74 6.56 NA
## 258 389.70 5.12 50.0
## 266 392.40 10.45 NA
## 284 395.52 3.16 NA
## 289 396.90 7.60 22.3
## 292 396.90 3.56 NA
## 295 396.90 10.40 21.7
## 305 393.68 6.93 NA
## 310 396.24 9.97 20.3
## 311 350.45 12.64 16.1
## 319 395.21 10.36 NA
## 331 368.57 9.09 NA
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## 334 389.71 5.68 22.2
## 336 396.90 8.01 NA

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## 347 364.61 12.67 17.2
## 349 390.94 5.99 24.5
## 354 384.46 4.50 NA
## 364 353.04 14.64 16.8
## 365 354.55 5.29 21.9
## 366 354.70 7.12 27.5
## 368 131.42 13.33 NA
## 372 366.15 9.53 50.0
## 383 396.90 23.60 11.3
## 400 338.16 29.97 6.3
## 402 396.90 20.32 7.2
## 413 28.79 34.37 17.9
## 415 88.27 36.98 7.0
## 418 127.36 26.64 NA
## 421 318.75 15.02 16.7
## 423 291.55 14.10 20.8
## 425 3.65 17.16 11.7
## 435 100.63 15.17 11.7
## 437 27.49 18.05 9.6
## 438 9.32 26.45 8.7
## 445 240.52 23.79 10.8
## 453 385.09 17.27 16.1
## 476 302.76 24.10 NA
## 492 390.11 18.07 13.6
## 496 393.29 17.60 NA
## 497 396.90 21.14 19.7
## 499 396.90 12.92 NA
## 503 396.90 9.08 NA
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mdata$indus
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## [121] 25.65 25.65 25.65 25.65 25.65 25.65 25.65 25.65 21.89 21.89 21.89 21.89
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## [145] 19.58 19.58 19.58 19.58 19.58 19.58 19.58 19.58 19.58 19.58 19.58 19.58
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## [421] 18.10 18.10 18.10 18.10 18.10 18.10 18.10 18.10 18.10 18.10 18.10 18.10
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## [445] 18.10 18.10 18.10 18.10 18.10 18.10 18.10 18.10 18.10 18.10 18.10 18.10
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#edit(mdata$indus)
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mdata
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## 1      1      NA 18.0 2.31 0 0.5380 6.575 65.2 4.0900 1 296 15.3
## 2      2 0.02731 0.0 7.07 0 0.4690 6.421 78.9 4.9671 2 242 17.8
## 3      3 0.02729 0.0 7.07 0 0.4690 7.185 61.1 4.9671 2 242 17.8
## 4      4 0.03237 0.0 NA 0 0.4580 6.998 45.8 6.0622 3 222 18.7
## 5      5 0.06905 0.0 2.18 0 0.4580 7.147 54.2 6.0622 3 222 18.7
## 6      6      NA 0.0 2.18 0 0.4580 6.430 58.7 6.0622 3 222 18.7
## 7      7 0.08829 12.5 7.87 0 0.5240 6.012 66.6 5.5605 5 311 15.2
## 8      8 0.14455 12.5 7.87 0 0.5240 6.172 96.1 5.9505 5 311 15.2
## 9      9      NA 12.5 7.87 0 0.5240 5.631 100.0 6.0821 5 311 15.2
## 10     10 0.17004 12.5 7.87 0 0.5240 6.004 85.9 6.5921 5 311 15.2
## 11     11 0.22489 12.5 7.87 0 0.5240 6.377 94.3 6.3467 5 311 15.2
## 12     12 0.11747 12.5 7.87 0 0.5240 6.009 82.9 6.2267 5 311 15.2
## 13     13 0.09378 12.5 7.87 0 0.5240 5.889 39.0 5.4509 5 311 15.2
## 14     14      NA 0.0 8.14 0 0.5380 5.949 61.8 4.7075 4 307 21.0
## 15     15 0.63796 0.0 8.14 0 0.5380 6.096 84.5 4.4619 4 307 21.0
## 16     16 0.62739 0.0 8.14 0 0.5380 5.834 56.5 4.4986 4 307 21.0
## 17     17 1.05393 0.0 8.14 0 0.5380 5.935 29.3 4.4986 4 307 21.0
## 18     18 0.78420 0.0 8.14 0 0.5380 5.990 81.7 4.2579 4 307 21.0
## 19     19 0.80271 0.0 8.14 0 0.5380 5.456 36.6 3.7965 4 307 21.0
## 20     20 0.72580 0.0 8.14 0 0.5380 5.727 69.5 3.7965 4 307 21.0
## 21     21 1.25179 0.0 8.14 0 0.5380 5.570 98.1 3.7979 4 307 21.0
## 22     22      NA 0.0 8.14 0 0.5380 5.965 89.2 4.0123 4 307 21.0
## 23     23 1.23247 0.0 8.14 0 0.5380 6.142 91.7 3.9769 4 307 21.0
## 24     24 0.98843 0.0 8.14 0 0.5380 5.813 100.0 4.0952 4 307 21.0
## 25     25 0.75026 0.0 8.14 0 0.5380 5.924 94.1 4.3996 4 307 21.0
## 26     26 0.84054 0.0 8.14 0 0.5380 5.599 85.7 4.4546 4 307 21.0
## 27     27 0.67191 0.0 8.14 0 0.5380 5.813 90.3 4.6820 4 307 21.0
## 28     28 0.95577 0.0 8.14 0 0.5380 6.047 88.8 4.4534 4 307 21.0
## 29     29 0.77299 0.0 8.14 0 0.5380 6.495 94.4 4.4547 4 307 21.0
```

## 30	30	1.00245	0.0	8.14	0	0.5380	6.674	87.3	4.2390	4	307	21.0
## 31	31	1.13081	0.0	8.14	0	0.5380	5.713	94.1	4.2330	4	307	21.0
## 32	32	1.35472	0.0	8.14	0	0.5380	6.072	100.0	4.1750	4	307	21.0
## 33	33	1.38799	0.0	8.14	0	0.5380	5.950	82.0	3.9900	4	307	21.0
## 34	34	1.15172	0.0	8.14	0	0.5380	5.701	95.0	3.7872	4	307	21.0
## 35	35	1.61282	0.0	8.14	0	0.5380	6.096	96.9	3.7598	4	307	21.0
## 36	36	NA	0.0	5.96	0	0.4990	5.933	68.2	3.3603	5	279	19.2
## 37	37	0.09744	0.0	5.96	0	0.4990	5.841	61.4	3.3779	5	279	19.2
## 38	38	0.08014	0.0	5.96	0	0.4990	5.850	41.5	3.9342	5	279	19.2
## 39	39	0.17505	0.0	5.96	0	0.4990	5.966	30.2	3.8473	5	279	19.2
## 40	40	0.02763	75.0	2.95	0	0.4280	6.595	21.8	5.4011	3	252	18.3
## 41	41	0.03359	75.0	2.95	0	0.4280	7.024	15.8	5.4011	3	252	18.3
## 42	42	0.12744	0.0	6.91	0	0.4480	6.770	2.9	5.7209	3	233	17.9
## 43	43	0.14150	0.0	6.91	0	0.4480	6.169	6.6	5.7209	3	233	17.9
## 44	44	0.15936	0.0	6.91	0	0.4480	6.211	6.5	5.7209	3	233	17.9
## 45	45	0.12269	0.0	6.91	0	0.4480	6.069	40.0	5.7209	3	233	17.9
## 46	46	0.17142	0.0	6.91	0	0.4480	5.682	33.8	5.1004	3	233	17.9
## 47	47	0.18836	0.0	6.91	0	0.4480	5.786	33.3	5.1004	3	233	17.9
## 48	48	0.22927	0.0	6.91	0	0.4480	NA	85.5	5.6894	3	233	17.9
## 49	49	0.25387	0.0	6.91	0	0.4480	5.399	95.3	5.8700	3	233	17.9
## 50	50	0.21977	0.0	6.91	0	0.4480	5.602	62.0	6.0877	3	233	17.9
## 51	51	0.08873	21.0	5.64	0	0.4390	5.963	45.7	6.8147	4	243	16.8
## 52	52	0.04337	21.0	5.64	0	0.4390	6.115	63.0	6.8147	4	243	16.8
## 53	53	0.05360	21.0	5.64	0	0.4390	6.511	21.1	6.8147	4	243	16.8
## 54	54	0.04981	21.0	5.64	0	0.4390	5.998	21.4	6.8147	4	243	16.8
## 55	55	NA	75.0	4.00	0	0.4100	5.888	47.6	7.3197	3	469	21.1
## 56	56	0.01311	90.0	1.22	0	0.4030	7.249	21.9	8.6966	5	226	17.9
## 57	57	0.02055	85.0	0.74	0	0.4100	6.383	35.7	9.1876	2	313	17.3
## 58	58	0.01432	100.0	1.32	0	0.4110	6.816	40.5	8.3248	5	256	15.1
## 59	59	0.15445	25.0	5.13	0	0.4530	6.145	29.2	7.8148	8	284	19.7
## 60	60	0.10328	25.0	5.13	0	0.4530	5.927	47.2	6.9320	8	284	19.7
## 61	61	NA	25.0	5.13	0	0.4530	5.741	66.2	7.2254	8	284	19.7
## 62	62	0.17171	25.0	5.13	0	0.4530	5.966	93.4	6.8185	8	284	19.7
## 63	63	0.11027	25.0	5.13	0	0.4530	6.456	67.8	7.2255	8	284	19.7
## 64	64	0.12650	25.0	5.13	0	0.4530	6.762	43.4	7.9809	8	284	19.7
## 65	65	0.01951	17.5	1.38	0	0.4161	7.104	59.5	9.2229	3	216	18.6
## 66	66	0.03584	80.0	NA	0	0.3980	6.290	17.8	6.6115	4	337	16.1
## 67	67	0.04379	80.0	3.37	0	0.3980	5.787	31.1	6.6115	4	337	16.1
## 68	68	0.05789	12.5	6.07	0	0.4090	5.878	21.4	6.4980	4	345	18.9
## 69	69	0.13554	12.5	6.07	0	0.4090	5.594	36.8	6.4980	4	345	18.9
## 70	70	NA	12.5	6.07	0	0.4090	5.885	33.0	6.4980	4	345	18.9
## 71	71	0.08826	0.0	10.81	0	0.4130	6.417	6.6	5.2873	4	305	19.2
## 72	72	0.15876	0.0	10.81	0	0.4130	5.961	17.5	5.2873	4	305	19.2
## 73	73	0.09164	0.0	10.81	0	0.4130	6.065	7.8	5.2873	4	305	19.2
## 74	74	0.19539	0.0	10.81	0	0.4130	6.245	6.2	5.2873	4	305	19.2
## 75	75	0.07896	0.0	12.83	0	0.4370	6.273	6.0	4.2515	5	398	18.7
## 76	76	0.09512	0.0	12.83	0	0.4370	6.286	45.0	4.5026	5	398	18.7
## 77	77	0.10153	0.0	12.83	0	0.4370	6.279	74.5	4.0522	5	398	18.7
## 78	78	0.08707	0.0	12.83	0	0.4370	6.140	45.8	4.0905	5	398	18.7
## 79	79	0.05646	0.0	12.83	0	0.4370	6.232	53.7	5.0141	5	398	18.7
## 80	80	0.08387	0.0	12.83	0	0.4370	5.874	36.6	4.5026	5	398	18.7
## 81	81	0.04113	25.0	4.86	0	0.4260	6.727	33.5	5.4007	4	281	19.0
## 82	82	NA	25.0	4.86	0	0.4260	6.619	70.4	5.4007	4	281	19.0
## 83	83	0.03659	25.0	4.86	0	0.4260	6.302	32.2	5.4007	4	281	19.0

## 84	84	NA	25.0	4.86	0	0.4260	6.167	46.7	5.4007	4	281	19.0
## 85	85	0.05059	0.0	4.49	0	0.4490	6.389	48.0	4.7794	3	247	18.5
## 86	86	0.05735	0.0	4.49	0	0.4490	6.630	56.1	4.4377	3	247	18.5
## 87	87	0.05188	0.0	4.49	0	0.4490	6.015	45.1	4.4272	3	247	18.5
## 88	88	0.07151	0.0	4.49	0	0.4490	6.121	56.8	3.7476	3	247	18.5
## 89	89	0.05660	0.0	3.41	0	0.4890	7.007	86.3	3.4217	2	270	17.8
## 90	90	0.05302	0.0	3.41	0	0.4890	7.079	63.1	3.4145	2	270	17.8
## 91	91	0.04684	0.0	3.41	0	0.4890	6.417	66.1	3.0923	2	270	17.8
## 92	92	0.03932	0.0	3.41	0	0.4890	6.405	73.9	3.0921	2	270	17.8
## 93	93	0.04203	28.0	15.04	0	0.4640	6.442	53.6	3.6659	4	270	18.2
## 94	94	NA	28.0	15.04	0	0.4640	6.211	28.9	3.6659	4	270	18.2
## 95	95	0.04294	28.0	15.04	0	0.4640	6.249	77.3	3.6150	4	270	18.2
## 96	96	NA	0.0	2.89	0	0.4450	6.625	57.8	3.4952	2	276	18.0
## 97	97	0.11504	0.0	2.89	0	0.4450	6.163	69.6	3.4952	2	276	18.0
## 98	98	0.12083	0.0	2.89	0	0.4450	8.069	76.0	3.4952	2	276	18.0
## 99	99	0.08187	0.0	2.89	0	0.4450	7.820	36.9	3.4952	2	276	18.0
## 100	100	0.06860	0.0	2.89	0	0.4450	7.416	62.5	3.4952	2	276	18.0
## 101	101	0.14866	0.0	8.56	0	0.5200	6.727	79.9	2.7778	5	384	20.9
## 102	102	0.11432	0.0	8.56	0	0.5200	6.781	71.3	2.8561	5	384	20.9
## 103	103	NA	0.0	8.56	0	0.5200	6.405	85.4	2.7147	5	384	20.9
## 104	104	NA	0.0	8.56	0	0.5200	6.137	87.4	2.7147	5	384	20.9
## 105	105	0.13960	0.0	8.56	0	0.5200	6.167	90.0	2.4210	5	384	20.9
## 106	106	NA	0.0	8.56	0	0.5200	5.851	96.7	2.1069	5	384	20.9
## 107	107	0.17120	0.0	NA	0	0.5200	5.836	91.9	2.2110	5	384	20.9
## 108	108	0.13117	0.0	8.56	0	0.5200	6.127	85.2	2.1224	5	384	20.9
## 109	109	0.12802	0.0	8.56	0	0.5200	6.474	97.1	2.4329	5	384	20.9
## 110	110	0.26363	0.0	8.56	0	0.5200	6.229	91.2	2.5451	5	384	20.9
## 111	111	0.10793	0.0	8.56	0	0.5200	6.195	54.4	2.7778	5	384	20.9
## 112	112	0.10084	0.0	10.01	0	0.5470	6.715	81.6	2.6775	6	432	17.8
## 113	113	0.12329	0.0	10.01	0	0.5470	5.913	92.9	2.3534	6	432	17.8
## 114	114	0.22212	0.0	10.01	0	0.5470	6.092	95.4	2.5480	6	432	17.8
## 115	115	0.14231	0.0	10.01	0	0.5470	6.254	84.2	2.2565	6	432	17.8
## 116	116	0.17134	0.0	10.01	0	0.5470	5.928	88.2	2.4631	6	432	17.8
## 117	117	0.13158	0.0	10.01	0	0.5470	6.176	72.5	2.7301	6	432	17.8
## 118	118	0.15098	0.0	10.01	0	0.5470	6.021	82.6	2.7474	6	432	17.8
## 119	119	0.13058	0.0	10.01	0	0.5470	5.872	73.1	2.4775	6	432	17.8
## 120	120	0.14476	0.0	10.01	0	0.5470	5.731	65.2	2.7592	6	432	17.8
## 121	121	0.06899	0.0	25.65	0	0.5810	5.870	69.7	2.2577	2	188	19.1
## 122	122	0.07165	0.0	25.65	0	0.5810	6.004	84.1	2.1974	2	188	19.1
## 123	123	0.09299	0.0	25.65	0	0.5810	5.961	92.9	2.0869	2	188	19.1
## 124	124	NA	0.0	25.65	0	0.5810	5.856	97.0	1.9444	2	188	19.1
## 125	125	0.09849	0.0	25.65	0	0.5810	5.879	95.8	2.0063	2	188	19.1
## 126	126	0.16902	0.0	25.65	0	0.5810	5.986	88.4	1.9929	2	188	19.1
## 127	127	0.38735	0.0	25.65	0	0.5810	5.613	95.6	1.7572	2	188	19.1
## 128	128	0.25915	0.0	21.89	0	0.6240	5.693	96.0	1.7883	4	437	21.2
## 129	129	NA	0.0	21.89	0	0.6240	6.431	98.8	1.8125	4	437	21.2
## 130	130	NA	0.0	21.89	0	0.6240	5.637	94.7	1.9799	4	437	21.2
## 131	131	0.34006	0.0	21.89	0	0.6240	6.458	98.9	2.1185	4	437	21.2
## 132	132	1.19294	0.0	21.89	0	0.6240	6.326	97.7	2.2710	4	437	21.2
## 133	133	NA	0.0	21.89	0	0.6240	6.372	97.9	2.3274	4	437	21.2
## 134	134	0.32982	0.0	21.89	0	0.6240	5.822	95.4	2.4699	4	437	21.2
## 135	135	NA	0.0	21.89	0	0.6240	5.757	98.4	2.3460	4	437	21.2
## 136	136	0.55778	0.0	21.89	0	0.6240	6.335	98.2	2.1107	4	437	21.2
## 137	137	0.32264	0.0	21.89	0	0.6240	5.942	93.5	1.9669	4	437	21.2



##	138	138	0.35233	0.0	21.89	0	0.6240	6.454	98.4	1.8498	4	437	21.2
##	139	139	0.24980	0.0	21.89	0	0.6240	5.857	98.2	1.6686	4	437	21.2
##	140	140	0.54452	0.0	21.89	0	0.6240	6.151	97.9	1.6687	4	437	21.2
##	141	141	0.29090	0.0	21.89	0	0.6240	6.174	93.6	1.6119	4	437	21.2
##	142	142	1.62864	0.0	21.89	0	0.6240	5.019	100.0	1.4394	4	437	21.2
##	143	143	3.32105	0.0	19.58	1	0.8710	5.403	100.0	1.3216	5	403	14.7
##	144	144	4.09740	0.0	19.58	0	0.8710	5.468	100.0	1.4118	5	403	14.7
##	145	145	2.77974	0.0	19.58	0	0.8710	4.903	97.8	1.3459	5	403	14.7
##	146	146	2.37934	0.0	19.58	0	0.8710	6.130	100.0	1.4191	5	403	14.7
##	147	147	2.15505	0.0	19.58	0	0.8710	5.628	100.0	1.5166	5	403	14.7
##	148	148	2.36862	0.0	19.58	0	0.8710	4.926	95.7	1.4608	5	403	14.7
##	149	149	2.33099	0.0	19.58	0	0.8710	5.186	93.8	1.5296	5	403	14.7
##	150	150	NA	0.0	19.58	0	0.8710	5.597	94.9	1.5257	5	403	14.7
##	151	151	1.65660	0.0	19.58	0	0.8710	6.122	97.3	1.6180	5	403	14.7
##	152	152	NA	0.0	19.58	0	0.8710	5.404	100.0	1.5916	5	403	14.7
##	153	153	1.12658	0.0	19.58	1	0.8710	5.012	88.0	1.6102	5	403	14.7
##	154	154	2.14918	0.0	19.58	0	0.8710	5.709	98.5	1.6232	5	403	14.7
##	155	155	1.41385	0.0	19.58	1	0.8710	6.129	96.0	1.7494	5	403	14.7
##	156	156	3.53501	0.0	19.58	1	0.8710	6.152	82.6	1.7455	5	403	14.7
##	157	157	NA	0.0	19.58	0	0.8710	5.272	94.0	1.7364	5	403	14.7
##	158	158	1.22358	0.0	19.58	0	0.6050	6.943	97.4	1.8773	5	403	14.7
##	159	159	1.34284	0.0	19.58	0	0.6050	NA	100.0	1.7573	5	403	14.7
##	160	160	NA	0.0	19.58	0	0.8710	6.510	100.0	1.7659	5	403	14.7
##	161	161	1.27346	0.0	19.58	1	0.6050	6.250	92.6	1.7984	5	403	14.7
##	162	162	1.46336	0.0	19.58	0	0.6050	7.489	90.8	1.9709	5	403	14.7
##	163	163	NA	0.0	19.58	1	0.6050	7.802	98.2	2.0407	5	403	14.7
##	164	164	1.51902	0.0	19.58	1	0.6050	8.375	93.9	2.1620	5	403	14.7
##	165	165	2.24236	0.0	19.58	0	0.6050	5.854	91.8	2.4220	5	403	14.7
##	166	166	2.92400	0.0	19.58	0	0.6050	6.101	93.0	2.2834	5	403	14.7
##	167	167	2.01019	0.0	19.58	0	0.6050	7.929	96.2	2.0459	5	403	14.7
##	168	168	1.80028	0.0	19.58	0	0.6050	5.877	79.2	2.4259	5	403	14.7
##	169	169	2.30040	0.0	19.58	0	0.6050	6.319	96.1	2.1000	5	403	14.7
##	170	170	2.44953	0.0	19.58	0	0.6050	6.402	95.2	2.2625	5	403	14.7
##	171	171	NA	0.0	19.58	0	0.6050	5.875	94.6	2.4259	5	403	14.7
##	172	172	2.31390	0.0	19.58	0	0.6050	5.880	97.3	2.3887	5	403	14.7
##	173	173	0.13914	0.0	4.05	0	0.5100	5.572	88.5	2.5961	5	296	16.6
##	174	174	NA	0.0	4.05	0	0.5100	6.416	84.1	2.6463	5	296	16.6
##	175	175	0.08447	0.0	4.05	0	0.5100	5.859	68.7	2.7019	5	296	16.6
##	176	176	0.06664	0.0	4.05	0	0.5100	6.546	33.1	3.1323	5	296	16.6
##	177	177	0.07022	0.0	4.05	0	0.5100	6.020	47.2	3.5549	5	296	16.6
##	178	178	0.05425	0.0	4.05	0	0.5100	6.315	73.4	3.3175	5	296	16.6
##	179	179	0.06642	0.0	4.05	0	0.5100	6.860	74.4	2.9153	5	296	16.6
##	180	180	0.05780	0.0	2.46	0	0.4880	6.980	58.4	2.8290	3	193	17.8
##	181	181	NA	0.0	2.46	0	0.4880	7.765	83.3	2.7410	3	193	17.8
##	182	182	0.06888	0.0	2.46	0	0.4880	6.144	62.2	2.5979	3	193	17.8
##	183	183	0.09103	0.0	2.46	0	0.4880	7.155	92.2	2.7006	3	193	17.8
##	184	184	0.10008	0.0	2.46	0	0.4880	6.563	95.6	2.8470	3	193	17.8
##	185	185	0.08308	0.0	2.46	0	0.4880	5.604	89.8	2.9879	3	193	17.8
##	186	186	0.06047	0.0	2.46	0	0.4880	6.153	68.8	3.2797	3	193	17.8
##	187	187	0.05602	0.0	NA	0	0.4880	7.831	53.6	3.1992	3	193	17.8
##	188	188	0.07875	45.0	3.44	0	0.4370	6.782	41.1	3.7886	5	398	15.2
##	189	189	0.12579	45.0	3.44	0	0.4370	6.556	29.1	4.5667	5	398	15.2
##	190	190	0.08370	45.0	3.44	0	0.4370	7.185	38.9	4.5667	5	398	15.2
##	191	191	0.09068	45.0	3.44	0	0.4370	6.951	21.5	6.4798	5	398	15.2

##	192	192	0.06911	45.0	3.44	0	0.4370	6.739	30.8	6.4798	5	398	15.2
##	193	193	0.08664	45.0	3.44	0	0.4370	7.178	26.3	6.4798	5	398	15.2
##	194	194	0.02187	60.0	2.93	0	0.4010	6.800	9.9	6.2196	1	265	15.6
##	195	195	0.01439	60.0	2.93	0	0.4010	6.604	18.8	6.2196	1	265	15.6
##	196	196	0.01381	80.0	0.46	0	0.4220	7.875	32.0	5.6484	4	255	14.4
##	197	197	0.04011	80.0	1.52	0	0.4040	7.287	34.1	7.3090	2	329	12.6
##	198	198	0.04666	80.0	1.52	0	0.4040	7.107	36.6	7.3090	2	329	12.6
##	199	199	0.03768	80.0	1.52	0	0.4040	7.274	38.3	7.3090	2	329	12.6
##	200	200	0.03150	95.0	1.47	0	0.4030	6.975	15.3	7.6534	3	402	17.0
##	201	201	NA	95.0	1.47	0	0.4030	7.135	13.9	7.6534	3	402	17.0
##	202	202	0.03445	82.5	2.03	0	0.4150	6.162	38.4	6.2700	2	348	14.7
##	203	203	0.02177	82.5	2.03	0	0.4150	7.610	15.7	6.2700	2	348	14.7
##	204	204	0.03510	95.0	2.68	0	0.4161	7.853	33.2	5.1180	4	224	14.7
##	205	205	0.02009	95.0	2.68	0	0.4161	8.034	31.9	5.1180	4	224	14.7
##	206	206	0.13642	0.0	10.59	0	0.4890	5.891	22.3	3.9454	4	277	18.6
##	207	207	NA	0.0	10.59	0	0.4890	6.326	52.5	4.3549	4	277	18.6
##	208	208	0.25199	0.0	10.59	0	0.4890	5.783	72.7	4.3549	4	277	18.6
##	209	209	0.13587	0.0	10.59	1	0.4890	6.064	59.1	4.2392	4	277	18.6
##	210	210	0.43571	0.0	10.59	1	0.4890	5.344	100.0	3.8750	4	277	18.6
##	211	211	0.17446	0.0	10.59	1	0.4890	5.960	92.1	3.8771	4	277	18.6
##	212	212	0.37578	0.0	10.59	1	0.4890	5.404	88.6	3.6650	4	277	18.6
##	213	213	0.21719	0.0	10.59	1	0.4890	5.807	53.8	3.6526	4	277	18.6
##	214	214	0.14052	0.0	10.59	0	0.4890	6.375	32.3	3.9454	4	277	18.6
##	215	215	0.28955	0.0	10.59	0	0.4890	5.412	9.8	3.5875	4	277	18.6
##	216	216	0.19802	0.0	10.59	0	0.4890	6.182	42.4	3.9454	4	277	18.6
##	217	217	0.04560	0.0	13.89	1	0.5500	5.888	56.0	3.1121	5	276	16.4
##	218	218	0.07013	0.0	13.89	0	0.5500	6.642	85.1	3.4211	5	276	16.4
##	219	219	0.11069	0.0	13.89	1	0.5500	5.951	93.8	2.8893	5	276	16.4
##	220	220	0.11425	0.0	13.89	1	0.5500	6.373	92.4	3.3633	5	276	16.4
##	221	221	0.35809	0.0	6.20	1	0.5070	6.951	88.5	2.8617	8	307	17.4
##	222	222	0.40771	0.0	6.20	1	0.5070	6.164	91.3	3.0480	8	307	17.4
##	223	223	0.62356	0.0	6.20	1	0.5070	6.879	77.7	3.2721	8	307	17.4
##	224	224	0.61470	0.0	NA	0	0.5070	6.618	80.8	3.2721	8	307	17.4
##	225	225	NA	0.0	6.20	0	0.5040	8.266	78.3	2.8944	8	307	17.4
##	226	226	0.52693	0.0	6.20	0	0.5040	8.725	83.0	2.8944	8	307	17.4
##	227	227	0.38214	0.0	6.20	0	0.5040	8.040	86.5	3.2157	8	307	17.4
##	228	228	0.41238	0.0	6.20	0	0.5040	7.163	79.9	3.2157	8	307	17.4
##	229	229	0.29819	0.0	6.20	0	0.5040	7.686	17.0	3.3751	8	307	17.4
##	230	230	0.44178	0.0	6.20	0	0.5040	6.552	21.4	3.3751	8	307	17.4
##	231	231	0.53700	0.0	6.20	0	0.5040	5.981	68.1	3.6715	8	307	17.4
##	232	232	0.46296	0.0	6.20	0	0.5040	7.412	76.9	3.6715	8	307	17.4
##	233	233	0.57529	0.0	6.20	0	0.5070	8.337	73.3	3.8384	8	307	17.4
##	234	234	0.33147	0.0	6.20	0	0.5070	8.247	70.4	3.6519	8	307	17.4
##	235	235	0.44791	0.0	6.20	1	0.5070	6.726	66.5	3.6519	8	307	17.4
##	236	236	0.33045	0.0	6.20	0	0.5070	6.086	61.5	3.6519	8	307	17.4
##	237	237	0.52058	0.0	6.20	1	0.5070	6.631	76.5	4.1480	8	307	17.4
##	238	238	0.51183	0.0	6.20	0	0.5070	7.358	71.6	4.1480	8	307	17.4
##	239	239	0.08244	30.0	4.93	0	0.4280	6.481	18.5	6.1899	6	300	16.6
##	240	240	0.09252	30.0	4.93	0	0.4280	6.606	42.2	6.1899	6	300	16.6
##	241	241	0.11329	30.0	4.93	0	0.4280	6.897	54.3	6.3361	6	300	16.6
##	242	242	0.10612	30.0	4.93	0	0.4280	6.095	65.1	6.3361	6	300	16.6
##	243	243	0.10290	30.0	NA	0	0.4280	6.358	52.9	7.0355	6	300	16.6
##	244	244	0.12757	30.0	4.93	0	0.4280	6.393	7.8	7.0355	6	300	16.6
##	245	245	0.20608	22.0	5.86	0	0.4310	5.593	76.5	7.9549	7	330	19.1

##	246	246	0.19133	22.0	5.86	0	0.4310	5.605	70.2	7.9549	7	330	19.1
##	247	247	0.33983	22.0	5.86	0	0.4310	6.108	34.9	8.0555	7	330	19.1
##	248	248	0.19657	22.0	5.86	0	0.4310	6.226	79.2	8.0555	7	330	19.1
##	249	249	0.16439	22.0	5.86	0	0.4310	6.433	49.1	7.8265	7	330	19.1
##	250	250	0.19073	22.0	5.86	0	0.4310	6.718	17.5	7.8265	7	330	19.1
##	251	251	0.14030	22.0	5.86	0	0.4310	6.487	13.0	7.3967	7	330	19.1
##	252	252	0.21409	22.0	5.86	0	0.4310	6.438	8.9	7.3967	7	330	19.1
##	253	253	0.08221	22.0	5.86	0	0.4310	6.957	6.8	8.9067	7	330	19.1
##	254	254	0.36894	22.0	5.86	0	0.4310	8.259	8.4	8.9067	7	330	19.1
##	255	255	0.04819	80.0	3.64	0	0.3920	6.108	32.0	9.2203	1	315	16.4
##	256	256	0.03548	80.0	3.64	0	0.3920	5.876	19.1	9.2203	1	315	16.4
##	257	257	0.01538	90.0	3.75	0	0.3940	7.454	34.2	6.3361	3	244	15.9
##	258	258	NA	20.0	3.97	0	0.6470	8.704	86.9	1.8010	5	264	13.0
##	259	259	0.66351	20.0	3.97	0	0.6470	7.333	100.0	1.8946	5	264	13.0
##	260	260	0.65665	20.0	3.97	0	0.6470	6.842	100.0	2.0107	5	264	13.0
##	261	261	0.54011	20.0	3.97	0	0.6470	7.203	81.8	2.1121	5	264	13.0
##	262	262	0.53412	20.0	3.97	0	0.6470	7.520	89.4	2.1398	5	264	13.0
##	263	263	0.52014	20.0	3.97	0	0.6470	8.398	91.5	2.2885	5	264	13.0
##	264	264	0.82526	20.0	3.97	0	0.6470	7.327	94.5	2.0788	5	264	13.0
##	265	265	0.55007	20.0	3.97	0	0.6470	7.206	91.6	1.9301	5	264	13.0
##	266	266	0.76162	20.0	3.97	0	0.6470	5.560	62.8	1.9865	5	264	13.0
##	267	267	0.78570	20.0	3.97	0	0.6470	7.014	84.6	2.1329	5	264	13.0
##	268	268	0.57834	20.0	3.97	0	0.5750	8.297	67.0	2.4216	5	264	13.0
##	269	269	0.54050	20.0	3.97	0	0.5750	7.470	52.6	2.8720	5	264	13.0
##	270	270	0.09065	20.0	6.96	1	0.4640	5.920	61.5	3.9175	3	223	18.6
##	271	271	0.29916	20.0	6.96	0	0.4640	5.856	42.1	4.4290	3	223	18.6
##	272	272	0.16211	20.0	6.96	0	0.4640	6.240	16.3	4.4290	3	223	18.6
##	273	273	0.11460	20.0	6.96	0	0.4640	6.538	58.7	3.9175	3	223	18.6
##	274	274	0.22188	20.0	6.96	1	0.4640	7.691	51.8	4.3665	3	223	18.6
##	275	275	0.05644	40.0	6.41	1	0.4470	6.758	32.9	4.0776	4	254	17.6
##	276	276	0.09604	40.0	6.41	0	0.4470	6.854	42.8	4.2673	4	254	17.6
##	277	277	0.10469	40.0	6.41	1	0.4470	7.267	49.0	4.7872	4	254	17.6
##	278	278	0.06127	40.0	6.41	1	0.4470	6.826	27.6	4.8628	4	254	17.6
##	279	279	0.07978	40.0	6.41	0	0.4470	6.482	32.1	4.1403	4	254	17.6
##	280	280	0.21038	20.0	3.33	0	0.4429	6.812	32.2	4.1007	5	216	14.9
##	281	281	0.03578	20.0	3.33	0	0.4429	7.820	64.5	4.6947	5	216	14.9
##	282	282	0.03705	20.0	3.33	0	0.4429	6.968	37.2	5.2447	5	216	14.9
##	283	283	0.06129	20.0	3.33	1	0.4429	7.645	49.7	5.2119	5	216	14.9
##	284	284	0.01501	90.0	1.21	1	0.4010	7.923	24.8	5.8850	1	198	13.6
##	285	285	0.00906	90.0	2.97	0	0.4000	7.088	20.8	7.3073	1	285	15.3
##	286	286	0.01096	55.0	2.25	0	0.3890	6.453	31.9	7.3073	1	300	15.3
##	287	287	0.01965	80.0	1.76	0	0.3850	6.230	31.5	9.0892	1	241	18.2
##	288	288	0.03871	52.5	5.32	0	0.4050	6.209	31.3	7.3172	6	293	16.6
##	289	289	0.04590	52.5	NA	0	0.4050	6.315	45.6	7.3172	6	293	16.6
##	290	290	0.04297	52.5	5.32	0	0.4050	6.565	22.9	7.3172	6	293	16.6
##	291	291	0.03502	80.0	4.95	0	0.4110	6.861	27.9	5.1167	4	245	19.2
##	292	292	0.07886	80.0	4.95	0	0.4110	7.148	27.7	5.1167	4	245	19.2
##	293	293	0.03615	80.0	4.95	0	0.4110	6.630	23.4	5.1167	4	245	19.2
##	294	294	0.08265	0.0	13.92	0	0.4370	6.127	18.4	5.5027	4	289	16.0
##	295	295	NA	0.0	13.92	0	0.4370	6.009	42.3	5.5027	4	289	16.0
##	296	296	0.12932	0.0	13.92	0	0.4370	6.678	31.1	5.9604	4	289	16.0
##	297	297	0.05372	0.0	13.92	0	0.4370	6.549	51.0	5.9604	4	289	16.0
##	298	298	0.14103	0.0	13.92	0	0.4370	5.790	58.0	6.3200	4	289	16.0
##	299	299	0.06466	70.0	2.24	0	0.4000	6.345	20.1	7.8278	5	358	14.8

##	300	300	0.05561	70.0	2.24	0	0.4000	7.041	10.0	7.8278	5	358	14.8
##	301	301	0.04417	70.0	2.24	0	0.4000	6.871	47.4	7.8278	5	358	14.8
##	302	302	0.03537	34.0	6.09	0	0.4330	6.590	40.4	5.4917	7	329	16.1
##	303	303	0.09266	34.0	6.09	0	0.4330	6.495	18.4	5.4917	7	329	16.1
##	304	304	0.10000	34.0	6.09	0	0.4330	6.982	17.7	5.4917	7	329	16.1
##	305	305	0.05515	33.0	2.18	0	0.4720	7.236	41.1	4.0220	7	222	18.4
##	306	306	0.05479	33.0	2.18	0	0.4720	6.616	58.1	3.3700	7	222	18.4
##	307	307	0.07503	33.0	2.18	0	0.4720	7.420	71.9	3.0992	7	222	18.4
##	308	308	0.04932	33.0	2.18	0	0.4720	6.849	70.3	3.1827	7	222	18.4
##	309	309	0.49298	0.0	9.90	0	0.5440	6.635	82.5	3.3175	4	304	18.4
##	310	310	NA	0.0	9.90	0	0.5440	5.972	76.7	3.1025	4	304	18.4
##	311	311	NA	0.0	9.90	0	0.5440	4.973	37.8	2.5194	4	304	18.4
##	312	312	0.79041	0.0	9.90	0	0.5440	6.122	52.8	2.6403	4	304	18.4
##	313	313	0.26169	0.0	9.90	0	0.5440	6.023	90.4	2.8340	4	304	18.4
##	314	314	0.26938	0.0	9.90	0	0.5440	6.266	82.8	3.2628	4	304	18.4
##	315	315	0.36920	0.0	9.90	0	0.5440	6.567	87.3	3.6023	4	304	18.4
##	316	316	0.25356	0.0	9.90	0	0.5440	5.705	77.7	3.9450	4	304	18.4
##	317	317	0.31827	0.0	9.90	0	0.5440	5.914	83.2	3.9986	4	304	18.4
##	318	318	0.24522	0.0	9.90	0	0.5440	5.782	71.7	4.0317	4	304	18.4
##	319	319	0.40202	0.0	9.90	0	0.5440	6.382	67.2	3.5325	4	304	18.4
##	320	320	0.47547	0.0	9.90	0	0.5440	6.113	58.8	4.0019	4	304	18.4
##	321	321	0.16760	0.0	7.38	0	0.4930	6.426	52.3	4.5404	5	287	19.6
##	322	322	0.18159	0.0	7.38	0	0.4930	6.376	54.3	4.5404	5	287	19.6
##	323	323	0.35114	0.0	7.38	0	0.4930	6.041	49.9	4.7211	5	287	19.6
##	324	324	0.28392	0.0	7.38	0	0.4930	5.708	74.3	4.7211	5	287	19.6
##	325	325	0.34109	0.0	7.38	0	0.4930	6.415	40.1	4.7211	5	287	19.6
##	326	326	0.19186	0.0	7.38	0	0.4930	6.431	14.7	5.4159	5	287	19.6
##	327	327	0.30347	0.0	7.38	0	0.4930	6.312	28.9	5.4159	5	287	19.6
##	328	328	0.24103	0.0	7.38	0	0.4930	6.083	43.7	5.4159	5	287	19.6
##	329	329	0.06617	0.0	3.24	0	0.4600	5.868	25.8	5.2146	4	430	16.9
##	330	330	0.06724	0.0	3.24	0	0.4600	6.333	17.2	5.2146	4	430	16.9
##	331	331	0.04544	0.0	3.24	0	0.4600	6.144	32.2	5.8736	4	430	16.9
##	332	332	0.05023	35.0	6.06	0	0.4379	5.706	28.4	6.6407	1	304	16.9
##	333	333	NA	35.0	NA	0	0.4379	6.031	23.3	6.6407	1	304	16.9
##	334	334	NA	0.0	5.19	0	0.5150	6.316	38.1	6.4584	5	224	20.2
##	335	335	0.03738	0.0	5.19	0	0.5150	6.310	38.5	6.4584	5	224	20.2
##	336	336	0.03961	0.0	5.19	0	0.5150	6.037	34.5	5.9853	5	224	20.2
##	337	337	0.03427	0.0	5.19	0	0.5150	5.869	46.3	5.2311	5	224	20.2
##	338	338	0.03041	0.0	5.19	0	0.5150	5.895	59.6	5.6150	5	224	20.2
##	339	339	0.03306	0.0	5.19	0	0.5150	6.059	37.3	4.8122	5	224	20.2
##	340	340	0.05497	0.0	5.19	0	0.5150	5.985	45.4	4.8122	5	224	20.2
##	341	341	0.06151	0.0	5.19	0	0.5150	5.968	58.5	4.8122	5	224	20.2
##	342	342	0.01301	35.0	1.52	0	0.4420	7.241	49.3	7.0379	1	284	15.5
##	343	343	0.02498	0.0	1.89	0	0.5180	6.540	59.7	6.2669	1	422	15.9
##	344	344	0.02543	55.0	3.78	0	0.4840	6.696	56.4	5.7321	5	370	17.6
##	345	345	0.03049	55.0	3.78	0	0.4840	6.874	28.1	6.4654	5	370	17.6
##	346	346	0.03113	0.0	4.39	0	0.4420	6.014	48.5	8.0136	3	352	18.8
##	347	347	NA	0.0	4.39	0	0.4420	5.898	52.3	8.0136	3	352	18.8
##	348	348	0.01870	85.0	4.15	0	0.4290	6.516	27.7	8.5353	4	351	17.9
##	349	349	NA	80.0	2.01	0	0.4350	6.635	29.7	8.3440	4	280	17.0
##	350	350	0.02899	40.0	1.25	0	0.4290	6.939	34.5	8.7921	1	335	19.7
##	351	351	0.06211	40.0	1.25	0	0.4290	6.490	44.4	8.7921	1	335	19.7
##	352	352	0.07950	60.0	1.69	0	0.4110	6.579	35.9	10.7103	4	411	18.3
##	353	353	0.07244	60.0	1.69	0	0.4110	5.884	18.5	10.7103	4	411	18.3

##	354	354	0.01709	90.0	2.02	0	0.4100	6.728	36.1	12.1265	5	187	17.0
##	355	355	0.04301	80.0	1.91	0	0.4130	5.663	21.9	10.5857	4	334	22.0
##	356	356	0.10659	80.0	1.91	0	0.4130	5.936	19.5	10.5857	4	334	22.0
##	357	357	8.98296	0.0	18.10	1	0.7700	6.212	97.4	2.1222	24	666	20.2
##	358	358	3.84970	0.0	18.10	1	0.7700	6.395	91.0	2.5052	24	666	20.2
##	359	359	5.20177	0.0	18.10	1	0.7700	6.127	83.4	2.7227	24	666	20.2
##	360	360	4.26131	0.0	18.10	0	0.7700	6.112	81.3	2.5091	24	666	20.2
##	361	361	4.54192	0.0	18.10	0	0.7700	6.398	88.0	2.5182	24	666	20.2
##	362	362	3.83684	0.0	18.10	0	0.7700	6.251	91.1	2.2955	24	666	20.2
##	363	363	3.67822	0.0	18.10	0	0.7700	5.362	96.2	2.1036	24	666	20.2
##	364	364	NA	0.0	18.10	1	0.7700	5.803	89.0	1.9047	24	666	20.2
##	365	365	NA	0.0	18.10	1	0.7180	8.780	82.9	1.9047	24	666	20.2
##	366	366	NA	0.0	18.10	0	0.7180	3.561	87.9	1.6132	24	666	20.2
##	367	367	3.69695	0.0	18.10	0	0.7180	4.963	91.4	1.7523	24	666	20.2
##	368	368	13.52220	0.0	18.10	0	0.6310	3.863	100.0	1.5106	24	666	20.2
##	369	369	4.89822	0.0	18.10	0	0.6310	4.970	100.0	1.3325	24	666	20.2
##	370	370	5.66998	0.0	18.10	1	0.6310	6.683	96.8	1.3567	24	666	20.2
##	371	371	6.53876	0.0	18.10	1	0.6310	7.016	97.5	1.2024	24	666	20.2
##	372	372	9.23230	0.0	18.10	0	0.6310	NA	100.0	1.1691	24	666	20.2
##	373	373	8.26725	0.0	18.10	1	0.6680	5.875	89.6	1.1296	24	666	20.2
##	374	374	11.10810	0.0	18.10	0	0.6680	4.906	100.0	1.1742	24	666	20.2
##	375	375	18.49820	0.0	18.10	0	0.6680	4.138	100.0	1.1370	24	666	20.2
##	376	376	19.60910	0.0	18.10	0	0.6710	7.313	97.9	1.3163	24	666	20.2
##	377	377	15.28800	0.0	18.10	0	0.6710	6.649	93.3	1.3449	24	666	20.2
##	378	378	9.82349	0.0	18.10	0	0.6710	6.794	98.8	1.3580	24	666	20.2
##	379	379	23.64820	0.0	18.10	0	0.6710	6.380	96.2	1.3861	24	666	20.2
##	380	380	17.86670	0.0	18.10	0	0.6710	6.223	100.0	1.3861	24	666	20.2
##	381	381	88.97620	0.0	18.10	0	0.6710	6.968	91.9	1.4165	24	666	20.2
##	382	382	15.87440	0.0	18.10	0	0.6710	6.545	99.1	1.5192	24	666	20.2
##	383	383	NA	0.0	18.10	0	0.7000	5.536	100.0	1.5804	24	666	20.2
##	384	384	7.99248	0.0	18.10	0	0.7000	5.520	100.0	1.5331	24	666	20.2
##	385	385	20.08490	0.0	18.10	0	0.7000	4.368	91.2	1.4395	24	666	20.2
##	386	386	16.81180	0.0	18.10	0	0.7000	5.277	98.1	1.4261	24	666	20.2
##	387	387	24.39380	0.0	18.10	0	0.7000	4.652	100.0	1.4672	24	666	20.2
##	388	388	22.59710	0.0	18.10	0	0.7000	5.000	89.5	1.5184	24	666	20.2
##	389	389	14.33370	0.0	18.10	0	0.7000	4.880	100.0	1.5895	24	666	20.2
##	390	390	8.15174	0.0	18.10	0	0.7000	5.390	98.9	1.7281	24	666	20.2
##	391	391	6.96215	0.0	18.10	0	0.7000	5.713	97.0	1.9265	24	666	20.2
##	392	392	5.29305	0.0	18.10	0	0.7000	6.051	82.5	2.1678	24	666	20.2
##	393	393	11.57790	0.0	18.10	0	0.7000	5.036	97.0	1.7700	24	666	20.2
##	394	394	8.64476	0.0	18.10	0	0.6930	6.193	92.6	1.7912	24	666	20.2
##	395	395	13.35980	0.0	18.10	0	0.6930	5.887	94.7	1.7821	24	666	20.2
##	396	396	8.71675	0.0	18.10	0	0.6930	6.471	98.8	1.7257	24	666	20.2
##	397	397	5.87205	0.0	18.10	0	0.6930	6.405	96.0	1.6768	24	666	20.2
##	398	398	7.67202	0.0	18.10	0	0.6930	5.747	98.9	1.6334	24	666	20.2
##	399	399	38.35180	0.0	18.10	0	0.6930	5.453	100.0	1.4896	24	666	20.2
##	400	400	9.91655	0.0	18.10	0	0.6930	NA	77.8	1.5004	24	666	20.2
##	401	401	25.04610	0.0	18.10	0	0.6930	5.987	100.0	1.5888	24	666	20.2
##	402	402	NA	0.0	18.10	0	0.6930	6.343	100.0	1.5741	24	666	20.2
##	403	403	9.59571	0.0	18.10	0	0.6930	6.404	100.0	1.6390	24	666	20.2
##	404	404	24.80170	0.0	18.10	0	0.6930	5.349	96.0	1.7028	24	666	20.2
##	405	405	41.52920	0.0	18.10	0	0.6930	5.531	85.4	1.6074	24	666	20.2
##	406	406	67.92080	0.0	18.10	0	0.6930	5.683	100.0	1.4254	24	666	20.2
##	407	407	20.71620	0.0	18.10	0	0.6590	4.138	100.0	1.1781	24	666	20.2

##	408	408	11.95110	0.0	18.10	0	0.6590	5.608	100.0	1.2852	24	666	20.2
##	409	409	7.40389	0.0	18.10	0	0.5970	5.617	97.9	1.4547	24	666	20.2
##	410	410	14.43830	0.0	18.10	0	0.5970	6.852	100.0	1.4655	24	666	20.2
##	411	411	51.13580	0.0	18.10	0	0.5970	5.757	100.0	1.4130	24	666	20.2
##	412	412	14.05070	0.0	18.10	0	0.5970	6.657	100.0	1.5275	24	666	20.2
##	413	413	18.81100	0.0	NA	0	0.5970	4.628	100.0	1.5539	24	666	20.2
##	414	414	28.65580	0.0	18.10	0	0.5970	5.155	100.0	1.5894	24	666	20.2
##	415	415	NA	0.0	18.10	0	0.6930	4.519	100.0	1.6582	24	666	20.2
##	416	416	18.08460	0.0	18.10	0	0.6790	6.434	100.0	1.8347	24	666	20.2
##	417	417	10.83420	0.0	18.10	0	0.6790	6.782	90.8	1.8195	24	666	20.2
##	418	418	25.94060	0.0	18.10	0	0.6790	5.304	89.1	1.6475	24	666	20.2
##	419	419	73.53410	0.0	18.10	0	0.6790	5.957	100.0	1.8026	24	666	20.2
##	420	420	11.81230	0.0	18.10	0	0.7180	6.824	76.5	1.7940	24	666	20.2
##	421	421	NA	0.0	18.10	0	0.7180	6.411	100.0	1.8589	24	666	20.2
##	422	422	7.02259	0.0	18.10	0	0.7180	6.006	95.3	1.8746	24	666	20.2
##	423	423	NA	0.0	18.10	0	0.6140	5.648	87.6	1.9512	24	666	20.2
##	424	424	7.05042	0.0	18.10	0	0.6140	6.103	85.1	2.0218	24	666	20.2
##	425	425	8.79212	0.0	18.10	0	0.5840	NA	70.6	2.0635	24	666	20.2
##	426	426	15.86030	0.0	18.10	0	0.6790	5.896	95.4	1.9096	24	666	20.2
##	427	427	12.24720	0.0	18.10	0	0.5840	5.837	59.7	1.9976	24	666	20.2
##	428	428	37.66190	0.0	18.10	0	0.6790	6.202	78.7	1.8629	24	666	20.2
##	429	429	7.36711	0.0	18.10	0	0.6790	6.193	78.1	1.9356	24	666	20.2
##	430	430	9.33889	0.0	18.10	0	0.6790	6.380	95.6	1.9682	24	666	20.2
##	431	431	8.49213	0.0	18.10	0	0.5840	6.348	86.1	2.0527	24	666	20.2
##	432	432	10.06230	0.0	18.10	0	0.5840	6.833	94.3	2.0882	24	666	20.2
##	433	433	6.44405	0.0	18.10	0	0.5840	6.425	74.8	2.2004	24	666	20.2
##	434	434	5.58107	0.0	18.10	0	0.7130	6.436	87.9	2.3158	24	666	20.2
##	435	435	NA	0.0	NA	0	0.7130	6.208	95.0	2.2222	24	666	20.2
##	436	436	11.16040	0.0	18.10	0	0.7400	6.629	94.6	2.1247	24	666	20.2
##	437	437	NA	0.0	18.10	0	0.7400	6.461	93.3	2.0026	24	666	20.2
##	438	438	NA	0.0	18.10	0	0.7400	6.152	100.0	1.9142	24	666	20.2
##	439	439	13.67810	0.0	18.10	0	0.7400	5.935	87.9	1.8206	24	666	20.2
##	440	440	9.39063	0.0	18.10	0	0.7400	5.627	93.9	1.8172	24	666	20.2
##	441	441	22.05110	0.0	18.10	0	0.7400	5.818	92.4	1.8662	24	666	20.2
##	442	442	9.72418	0.0	18.10	0	0.7400	6.406	97.2	2.0651	24	666	20.2
##	443	443	5.66637	0.0	18.10	0	0.7400	6.219	100.0	2.0048	24	666	20.2
##	444	444	9.96654	0.0	18.10	0	0.7400	6.485	100.0	1.9784	24	666	20.2
##	445	445	NA	0.0	18.10	0	0.7400	5.854	96.6	1.8956	24	666	20.2
##	446	446	10.67180	0.0	18.10	0	0.7400	6.459	94.8	1.9879	24	666	20.2
##	447	447	6.28807	0.0	18.10	0	0.7400	6.341	96.4	2.0720	24	666	20.2
##	448	448	9.92485	0.0	18.10	0	0.7400	6.251	96.6	2.1980	24	666	20.2
##	449	449	9.32909	0.0	18.10	0	0.7130	6.185	98.7	2.2616	24	666	20.2
##	450	450	7.52601	0.0	18.10	0	0.7130	6.417	98.3	2.1850	24	666	20.2
##	451	451	6.71772	0.0	18.10	0	0.7130	6.749	92.6	2.3236	24	666	20.2
##	452	452	5.44114	0.0	18.10	0	0.7130	6.655	98.2	2.3552	24	666	20.2
##	453	453	NA	0.0	18.10	0	0.7130	6.297	91.8	2.3682	24	666	20.2
##	454	454	8.24809	0.0	18.10	0	0.7130	7.393	99.3	2.4527	24	666	20.2
##	455	455	9.51363	0.0	18.10	0	0.7130	6.728	94.1	2.4961	24	666	20.2
##	456	456	4.75237	0.0	18.10	0	0.7130	6.525	86.5	2.4358	24	666	20.2
##	457	457	4.66883	0.0	18.10	0	0.7130	5.976	87.9	2.5806	24	666	20.2
##	458	458	8.20058	0.0	18.10	0	0.7130	5.936	80.3	2.7792	24	666	20.2
##	459	459	7.75223	0.0	18.10	0	0.7130	6.301	83.7	2.7831	24	666	20.2
##	460	460	6.80117	0.0	18.10	0	0.7130	6.081	84.4	2.7175	24	666	20.2
##	461	461	4.81213	0.0	18.10	0	0.7130	6.701	90.0	2.5975	24	666	20.2

##	462	462	3.69311	0.0	18.10	0	0.7130	6.376	88.4	2.5671	24	666	20.2
##	463	463	6.65492	0.0	18.10	0	0.7130	6.317	83.0	2.7344	24	666	20.2
##	464	464	5.82115	0.0	18.10	0	0.7130	6.513	89.9	2.8016	24	666	20.2
##	465	465	7.83932	0.0	18.10	0	0.6550	6.209	65.4	2.9634	24	666	20.2
##	466	466	3.16360	0.0	18.10	0	0.6550	5.759	48.2	3.0665	24	666	20.2
##	467	467	3.77498	0.0	18.10	0	0.6550	5.952	84.7	2.8715	24	666	20.2
##	468	468	4.42228	0.0	18.10	0	0.5840	6.003	94.5	2.5403	24	666	20.2
##	469	469	15.57570	0.0	18.10	0	0.5800	5.926	71.0	2.9084	24	666	20.2
##	470	470	13.07510	0.0	18.10	0	0.5800	5.713	56.7	2.8237	24	666	20.2
##	471	471	4.34879	0.0	18.10	0	0.5800	6.167	84.0	3.0334	24	666	20.2
##	472	472	4.03841	0.0	18.10	0	0.5320	6.229	90.7	3.0993	24	666	20.2
##	473	473	3.56868	0.0	18.10	0	0.5800	6.437	75.0	2.8965	24	666	20.2
##	474	474	4.64689	0.0	18.10	0	0.6140	6.980	67.6	2.5329	24	666	20.2
##	475	475	8.05579	0.0	18.10	0	0.5840	5.427	95.4	2.4298	24	666	20.2
##	476	476	6.39312	0.0	18.10	0	0.5840	6.162	97.4	2.2060	24	666	20.2
##	477	477	4.87141	0.0	18.10	0	0.6140	6.484	93.6	2.3053	24	666	20.2
##	478	478	15.02340	0.0	18.10	0	0.6140	5.304	97.3	2.1007	24	666	20.2
##	479	479	10.23300	0.0	18.10	0	0.6140	6.185	96.7	2.1705	24	666	20.2
##	480	480	14.33370	0.0	18.10	0	0.6140	6.229	88.0	1.9512	24	666	20.2
##	481	481	5.82401	0.0	18.10	0	0.5320	6.242	64.7	3.4242	24	666	20.2
##	482	482	5.70818	0.0	18.10	0	0.5320	6.750	74.9	3.3317	24	666	20.2
##	483	483	5.73116	0.0	18.10	0	0.5320	7.061	77.0	3.4106	24	666	20.2
##	484	484	2.81838	0.0	18.10	0	0.5320	5.762	40.3	4.0983	24	666	20.2
##	485	485	2.37857	0.0	18.10	0	0.5830	5.871	41.9	3.7240	24	666	20.2
##	486	486	3.67367	0.0	18.10	0	0.5830	6.312	51.9	3.9917	24	666	20.2
##	487	487	5.69175	0.0	18.10	0	0.5830	6.114	79.8	3.5459	24	666	20.2
##	488	488	4.83567	0.0	18.10	0	0.5830	5.905	53.2	3.1523	24	666	20.2
##	489	489	0.15086	0.0	27.74	0	0.6090	5.454	92.7	1.8209	4	711	20.1
##	490	490	0.18337	0.0	27.74	0	0.6090	5.414	98.3	1.7554	4	711	20.1
##	491	491	0.20746	0.0	27.74	0	0.6090	5.093	98.0	1.8226	4	711	20.1
##	492	492	NA	0.0	27.74	0	0.6090	5.983	98.8	1.8681	4	711	20.1
##	493	493	0.11132	0.0	27.74	0	0.6090	5.983	83.5	2.1099	4	711	20.1
##	494	494	0.17331	0.0	9.69	0	0.5850	5.707	54.0	2.3817	6	391	19.2
##	495	495	0.27957	0.0	9.69	0	0.5850	5.926	42.6	2.3817	6	391	19.2
##	496	496	0.17899	0.0	9.69	0	0.5850	5.670	28.8	2.7986	6	391	19.2
##	497	497	NA	0.0	9.69	0	0.5850	5.390	72.9	2.7986	6	391	19.2
##	498	498	0.26838	0.0	9.69	0	0.5850	5.794	70.6	2.8927	6	391	19.2
##	499	499	0.23912	0.0	9.69	0	0.5850	6.019	65.3	2.4091	6	391	19.2
##	500	500	0.17783	0.0	9.69	0	0.5850	5.569	73.5	2.3999	6	391	19.2
##	501	501	0.22438	0.0	9.69	0	0.5850	6.027	79.7	2.4982	6	391	19.2
##	502	502	0.06263	0.0	11.93	0	0.5730	6.593	69.1	2.4786	1	273	21.0
##	503	503	0.04527	0.0	11.93	0	0.5730	6.120	76.7	2.2875	1	273	21.0
##	504	504	0.06076	0.0	11.93	0	0.5730	6.976	91.0	2.1675	1	273	21.0
##	505	505	0.10959	0.0	11.93	0	0.5730	6.794	89.3	2.3889	1	273	21.0
##	506	506	0.04741	0.0	11.93	0	0.5730	6.030	80.8	2.5050	1	273	21.0
##			b lstat medv										
##	1		396.90	4.98	24.0								
##	2		396.90	9.14	21.6								
##	3		392.83	4.03	34.7								
##	4		394.63	2.94	33.4								
##	5		396.90	5.33	36.2								
##	6		394.12	5.21	28.7								
##	7		395.60	12.43	22.9								
##	8		396.90	19.15	NA								

## 9	386.63	29.93	16.5
## 10	386.71	17.10	NA
## 11	392.52	20.45	15.0
## 12	396.90	13.27	18.9
## 13	390.50	15.71	21.7
## 14	396.90	8.26	20.4
## 15	380.02	10.26	18.2
## 16	395.62	8.47	19.9
## 17	386.85	6.58	23.1
## 18	386.75	14.67	17.5
## 19	288.99	11.69	20.2
## 20	390.95	11.28	18.2
## 21	376.57	21.02	13.6
## 22	392.53	13.83	19.6
## 23	396.90	18.72	15.2
## 24	394.54	19.88	NA
## 25	394.33	16.30	15.6
## 26	303.42	16.51	13.9
## 27	376.88	14.81	16.6
## 28	306.38	17.28	14.8
## 29	387.94	12.80	18.4
## 30	380.23	11.98	21.0
## 31	360.17	22.60	12.7
## 32	376.73	13.04	14.5
## 33	232.60	27.71	13.2
## 34	358.77	18.35	13.1
## 35	248.31	20.34	13.5
## 36	396.90	9.68	18.9
## 37	377.56	11.41	20.0
## 38	396.90	8.77	21.0
## 39	393.43	10.13	24.7
## 40	395.63	4.32	30.8
## 41	395.62	1.98	NA
## 42	385.41	4.84	26.6
## 43	383.37	5.81	25.3
## 44	394.46	7.44	24.7
## 45	389.39	9.55	21.2
## 46	396.90	10.21	19.3
## 47	396.90	14.15	NA
## 48	392.74	18.80	16.6
## 49	396.90	30.81	14.4
## 50	396.90	16.20	19.4
## 51	395.56	13.45	19.7
## 52	393.97	9.43	20.5
## 53	396.90	5.28	25.0
## 54	396.90	8.43	23.4
## 55	396.90	14.80	18.9
## 56	395.93	4.81	NA
## 57	396.90	5.77	24.7
## 58	392.90	3.95	31.6
## 59	390.68	6.86	NA
## 60	396.90	9.22	19.6
## 61	395.11	13.15	18.7
## 62	378.08	14.44	16.0



## 63	396.90	6.73	22.2
## 64	395.58	9.50	25.0
## 65	393.24	8.05	33.0
## 66	396.90	4.67	23.5
## 67	396.90	10.24	19.4
## 68	396.21	8.10	22.0
## 69	396.90	13.09	17.4
## 70	396.90	8.79	20.9
## 71	383.73	6.72	24.2
## 72	376.94	9.88	21.7
## 73	390.91	5.52	22.8
## 74	377.17	7.54	23.4
## 75	394.92	6.78	24.1
## 76	383.23	8.94	21.4
## 77	373.66	11.97	20.0
## 78	386.96	10.27	20.8
## 79	386.40	12.34	21.2
## 80	396.06	9.10	20.3
## 81	396.90	5.29	28.0
## 82	395.63	7.22	23.9
## 83	396.90	6.72	24.8
## 84	390.64	7.51	22.9
## 85	396.90	9.62	23.9
## 86	392.30	6.53	26.6
## 87	395.99	12.86	NA
## 88	395.15	8.44	NA
## 89	396.90	5.50	23.6
## 90	396.06	5.70	28.7
## 91	392.18	8.81	22.6
## 92	393.55	8.20	22.0
## 93	395.01	8.16	22.9
## 94	396.33	6.21	25.0
## 95	396.90	10.59	20.6
## 96	357.98	6.65	28.4
## 97	391.83	11.34	21.4
## 98	396.90	4.21	38.7
## 99	393.53	3.57	43.8
## 100	396.90	6.19	33.2
## 101	394.76	9.42	27.5
## 102	395.58	7.67	NA
## 103	70.80	10.63	18.6
## 104	394.47	13.44	19.3
## 105	392.69	12.33	20.1
## 106	394.05	16.47	19.5
## 107	395.67	18.66	19.5
## 108	387.69	14.09	20.4
## 109	395.24	12.27	19.8
## 110	391.23	15.55	19.4
## 111	393.49	13.00	21.7
## 112	395.59	10.16	22.8
## 113	394.95	16.21	18.8
## 114	396.90	17.09	18.7
## 115	388.74	10.45	18.5
## 116	344.91	15.76	18.3

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## 117 393.30 12.04 21.2
## 118 394.51 10.30 19.2
## 119 338.63 15.37 20.4
## 120 391.50 13.61  NA
## 121 389.15 14.37 22.0
## 122 377.67 14.27 20.3
## 123 378.09 17.93 20.5
## 124 370.31 25.41 17.3
## 125 379.38 17.58 18.8
## 126 385.02 14.81 21.4
## 127 359.29 27.26 15.7
## 128 392.11 17.19 16.2
## 129 396.90 15.39 18.0
## 130 396.90 18.34 14.3
## 131 395.04 12.60 19.2
## 132 396.90 12.26 19.6
## 133 385.76 11.12 23.0
## 134 388.69 15.03 18.4
## 135 262.76 17.31 15.6
## 136 394.67 16.96 18.1
## 137 378.25 16.90 17.4
## 138 394.08 14.59 17.1
## 139 392.04 21.32 13.3
## 140 396.90 18.46 17.8
## 141 388.08 24.16 14.0
## 142 396.90 34.41 14.4
## 143 396.90 26.82 13.4
## 144 396.90 26.42 15.6
## 145 396.90 29.29 11.8
## 146 172.91 27.80 13.8
## 147 169.27 16.65 15.6
## 148 391.71 29.53 14.6
## 149 356.99 28.32 17.8
## 150 351.85 21.45 15.4
## 151 372.80 14.10 21.5
## 152 341.60 13.28 19.6
## 153 343.28 12.12 15.3
## 154 261.95 15.79 19.4
## 155 321.02 15.12 17.0
## 156  88.01 15.02 15.6
## 157  88.63 16.14 13.1
## 158 363.43  4.59 41.3
## 159 353.89  6.43 24.3
## 160 364.31  7.39 23.3
## 161 338.92  5.50  NA
## 162 374.43  1.73 50.0
## 163 389.61  1.92 50.0
## 164 388.45  3.32  NA
## 165 395.11 11.64 22.7
## 166 240.16  9.81 25.0
## 167 369.30  3.70 50.0
## 168 227.61 12.14 23.8
## 169 297.09 11.10 23.8
## 170 330.04 11.32 22.3

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## 171 292.29 14.43 17.4
## 172 348.13 12.03 19.1
## 173 396.90 14.69 23.1
## 174 395.50 9.04 23.6
## 175 393.23 9.64 22.6
## 176 390.96 5.33 29.4
## 177 393.23 10.11 23.2
## 178 395.60 6.29 24.6
## 179 391.27 6.92 29.9
## 180 396.90 5.04 37.2
## 181 395.56 7.56 39.8
## 182 396.90 9.45 NA
## 183 394.12 4.82 37.9
## 184 396.90 5.68 32.5
## 185 391.00 13.98 26.4
## 186 387.11 13.15 29.6
## 187 392.63 4.45 50.0
## 188 393.87 6.68 32.0
## 189 382.84 4.56 29.8
## 190 396.90 5.39 34.9
## 191 377.68 5.10 37.0
## 192 389.71 4.69 30.5
## 193 390.49 2.87 36.4
## 194 393.37 5.03 31.1
## 195 376.70 4.38 29.1
## 196 394.23 2.97 NA
## 197 396.90 4.08 33.3
## 198 354.31 8.61 30.3
## 199 392.20 6.62 34.6
## 200 396.90 4.56 34.9
## 201 384.30 4.45 32.9
## 202 393.77 7.43 24.1
## 203 395.38 3.11 42.3
## 204 392.78 3.81 48.5
## 205 390.55 2.88 50.0
## 206 396.90 10.87 22.6
## 207 394.87 10.97 24.4
## 208 389.43 18.06 22.5
## 209 381.32 14.66 24.4
## 210 396.90 23.09 20.0
## 211 393.25 17.27 21.7
## 212 395.24 23.98 19.3
## 213 390.94 16.03 22.4
## 214 385.81 9.38 28.1
## 215 348.93 29.55 23.7
## 216 393.63 9.47 25.0
## 217 392.80 13.51 23.3
## 218 392.78 9.69 28.7
## 219 396.90 17.92 21.5
## 220 393.74 10.50 23.0
## 221 391.70 9.71 26.7
## 222 395.24 21.46 21.7
## 223 390.39 9.93 27.5
## 224 396.90 7.60 30.1

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## 225 385.05 4.14 44.8
## 226 382.00 4.63 50.0
## 227 387.38 3.13 37.6
## 228 372.08 6.36 31.6
## 229 377.51 3.92 46.7
## 230 380.34 3.76 31.5
## 231 378.35 11.65 24.3
## 232 376.14 5.25 31.7
## 233 385.91 2.47 41.7
## 234 378.95 3.95 48.3
## 235 360.20 8.05 29.0
## 236 376.75 10.88 24.0
## 237 388.45 9.54 25.1
## 238 390.07 4.73 31.5
## 239 379.41 6.36 23.7
## 240 383.78 7.37 23.3
## 241 391.25 11.38 22.0
## 242 394.62 12.40 20.1
## 243 372.75 11.22 22.2
## 244 374.71 5.19 23.7
## 245 372.49 12.50 17.6
## 246 389.13 18.46 18.5
## 247 390.18 9.16 24.3
## 248 376.14 10.15 20.5
## 249 374.71 9.52 24.5
## 250 393.74 6.56 NA
## 251 396.28 5.90 24.4
## 252 377.07 3.59 24.8
## 253 386.09 3.53 29.6
## 254 396.90 3.54 42.8
## 255 392.89 6.57 21.9
## 256 395.18 9.25 20.9
## 257 386.34 3.11 44.0
## 258 389.70 5.12 50.0
## 259 383.29 7.79 36.0
## 260 391.93 6.90 30.1
## 261 392.80 9.59 33.8
## 262 388.37 7.26 43.1
## 263 386.86 5.91 48.8
## 264 393.42 11.25 31.0
## 265 387.89 8.10 36.5
## 266 392.40 10.45 NA
## 267 384.07 14.79 30.7
## 268 384.54 7.44 50.0
## 269 390.30 3.16 43.5
## 270 391.34 13.65 20.7
## 271 388.65 13.00 21.1
## 272 396.90 6.59 25.2
## 273 394.96 7.73 24.4
## 274 390.77 6.58 35.2
## 275 396.90 3.53 32.4
## 276 396.90 2.98 32.0
## 277 389.25 6.05 33.2
## 278 393.45 4.16 33.1

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## 279 396.90 7.19 29.1
## 280 396.90 4.85 35.1
## 281 387.31 3.76 45.4
## 282 392.23 4.59 35.4
## 283 377.07 3.01 46.0
## 284 395.52 3.16 NA
## 285 394.72 7.85 32.2
## 286 394.72 8.23 22.0
## 287 341.60 12.93 20.1
## 288 396.90 7.14 23.2
## 289 396.90 7.60 22.3
## 290 371.72 9.51 24.8
## 291 396.90 3.33 28.5
## 292 396.90 3.56 NA
## 293 396.90 4.70 27.9
## 294 396.90 8.58 23.9
## 295 396.90 10.40 21.7
## 296 396.90 6.27 28.6
## 297 392.85 7.39 27.1
## 298 396.90 15.84 20.3
## 299 368.24 4.97 22.5
## 300 371.58 4.74 29.0
## 301 390.86 6.07 24.8
## 302 395.75 9.50 22.0
## 303 383.61 8.67 26.4
## 304 390.43 4.86 33.1
## 305 393.68 6.93 NA
## 306 393.36 8.93 28.4
## 307 396.90 6.47 33.4
## 308 396.90 7.53 28.2
## 309 396.90 4.54 22.8
## 310 396.24 9.97 20.3
## 311 350.45 12.64 16.1
## 312 396.90 5.98 22.1
## 313 396.30 11.72 19.4
## 314 393.39 7.90 21.6
## 315 395.69 9.28 23.8
## 316 396.42 11.50 16.2
## 317 390.70 18.33 17.8
## 318 396.90 15.94 19.8
## 319 395.21 10.36 NA
## 320 396.23 12.73 21.0
## 321 396.90 7.20 23.8
## 322 396.90 6.87 23.1
## 323 396.90 7.70 20.4
## 324 391.13 11.74 18.5
## 325 396.90 6.12 25.0
## 326 393.68 5.08 24.6
## 327 396.90 6.15 23.0
## 328 396.90 12.79 22.2
## 329 382.44 9.97 19.3
## 330 375.21 7.34 22.6
## 331 368.57 9.09 NA
## 332 394.02 12.43 17.1

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## 333 362.25 7.83 19.4
## 334 389.71 5.68 22.2
## 335 389.40 6.75 20.7
## 336 396.90 8.01 NA
## 337 396.90 9.80 19.5
## 338 394.81 10.56 18.5
## 339 396.14 8.51 20.6
## 340 396.90 9.74 19.0
## 341 396.90 9.29 18.7
## 342 394.74 5.49 32.7
## 343 389.96 8.65 16.5
## 344 396.90 7.18 23.9
## 345 387.97 4.61 31.2
## 346 385.64 10.53 17.5
## 347 364.61 12.67 17.2
## 348 392.43 6.36 23.1
## 349 390.94 5.99 24.5
## 350 389.85 5.89 26.6
## 351 396.90 5.98 22.9
## 352 370.78 5.49 24.1
## 353 392.33 7.79 18.6
## 354 384.46 4.50 NA
## 355 382.80 8.05 18.2
## 356 376.04 5.57 20.6
## 357 377.73 17.60 17.8
## 358 391.34 13.27 21.7
## 359 395.43 11.48 22.7
## 360 390.74 12.67 22.6
## 361 374.56 7.79 25.0
## 362 350.65 14.19 19.9
## 363 380.79 10.19 20.8
## 364 353.04 14.64 16.8
## 365 354.55 5.29 21.9
## 366 354.70 7.12 27.5
## 367 316.03 14.00 21.9
## 368 131.42 13.33 NA
## 369 375.52 3.26 50.0
## 370 375.33 3.73 50.0
## 371 392.05 2.96 50.0
## 372 366.15 9.53 50.0
## 373 347.88 8.88 50.0
## 374 396.90 34.77 13.8
## 375 396.90 37.97 13.8
## 376 396.90 13.44 15.0
## 377 363.02 23.24 13.9
## 378 396.90 21.24 13.3
## 379 396.90 23.69 13.1
## 380 393.74 21.78 10.2
## 381 396.90 17.21 10.4
## 382 396.90 21.08 10.9
## 383 396.90 23.60 11.3
## 384 396.90 24.56 12.3
## 385 285.83 30.63 8.8
## 386 396.90 30.81 7.2

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## 387 396.90 28.28 10.5
## 388 396.90 31.99 7.4
## 389 372.92 30.62 10.2
## 390 396.90 20.85 11.5
## 391 394.43 17.11 15.1
## 392 378.38 18.76 23.2
## 393 396.90 25.68 9.7
## 394 396.90 15.17 13.8
## 395 396.90 16.35 12.7
## 396 391.98 17.12 13.1
## 397 396.90 19.37 12.5
## 398 393.10 19.92 8.5
## 399 396.90 30.59 5.0
## 400 338.16 29.97 6.3
## 401 396.90 26.77 5.6
## 402 396.90 20.32 7.2
## 403 376.11 20.31 12.1
## 404 396.90 19.77 8.3
## 405 329.46 27.38 8.5
## 406 384.97 22.98 5.0
## 407 370.22 23.34 11.9
## 408 332.09 12.13 27.9
## 409 314.64 26.40 17.2
## 410 179.36 19.78 27.5
## 411 2.60 10.11 15.0
## 412 35.05 21.22 17.2
## 413 28.79 34.37 17.9
## 414 210.97 20.08 16.3
## 415 88.27 36.98 7.0
## 416 27.25 29.05 7.2
## 417 21.57 25.79 7.5
## 418 127.36 26.64 NA
## 419 16.45 20.62 8.8
## 420 48.45 22.74 8.4
## 421 318.75 15.02 16.7
## 422 319.98 15.70 14.2
## 423 291.55 14.10 20.8
## 424 2.52 23.29 13.4
## 425 3.65 17.16 11.7
## 426 7.68 24.39 8.3
## 427 24.65 15.69 10.2
## 428 18.82 14.52 10.9
## 429 96.73 21.52 11.0
## 430 60.72 24.08 9.5
## 431 83.45 17.64 14.5
## 432 81.33 19.69 14.1
## 433 97.95 12.03 16.1
## 434 100.19 16.22 14.3
## 435 100.63 15.17 11.7
## 436 109.85 23.27 13.4
## 437 27.49 18.05 9.6
## 438 9.32 26.45 8.7
## 439 68.95 34.02 8.4
## 440 396.90 22.88 12.8

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## 441 391.45 22.11 10.5
## 442 385.96 19.52 17.1
## 443 395.69 16.59 18.4
## 444 386.73 18.85 15.4
## 445 240.52 23.79 10.8
## 446 43.06 23.98 11.8
## 447 318.01 17.79 14.9
## 448 388.52 16.44 12.6
## 449 396.90 18.13 14.1
## 450 304.21 19.31 13.0
## 451 0.32 17.44 13.4
## 452 355.29 17.73 15.2
## 453 385.09 17.27 16.1
## 454 375.87 16.74 17.8
## 455 6.68 18.71 14.9
## 456 50.92 18.13 14.1
## 457 10.48 19.01 12.7
## 458 3.50 16.94 13.5
## 459 272.21 16.23 14.9
## 460 396.90 14.70 20.0
## 461 255.23 16.42 16.4
## 462 391.43 14.65 17.7
## 463 396.90 13.99 19.5
## 464 393.82 10.29 20.2
## 465 396.90 13.22 21.4
## 466 334.40 14.13 19.9
## 467 22.01 17.15 19.0
## 468 331.29 21.32 19.1
## 469 368.74 18.13 19.1
## 470 396.90 14.76 20.1
## 471 396.90 16.29 19.9
## 472 395.33 12.87 19.6
## 473 393.37 14.36 23.2
## 474 374.68 11.66 29.8
## 475 352.58 18.14 13.8
## 476 302.76 24.10 NA
## 477 396.21 18.68 16.7
## 478 349.48 24.91 12.0
## 479 379.70 18.03 14.6
## 480 383.32 13.11 21.4
## 481 396.90 10.74 23.0
## 482 393.07 7.74 23.7
## 483 395.28 7.01 25.0
## 484 392.92 10.42 21.8
## 485 370.73 13.34 20.6
## 486 388.62 10.58 21.2
## 487 392.68 14.98 19.1
## 488 388.22 11.45 20.6
## 489 395.09 18.06 15.2
## 490 344.05 23.97 7.0
## 491 318.43 29.68 8.1
## 492 390.11 18.07 13.6
## 493 396.90 13.35 20.1
## 494 396.90 12.01 21.8

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```
## 495 396.90 13.59 24.5
## 496 393.29 17.60 NA
## 497 396.90 21.14 19.7
## 498 396.90 14.10 18.3
## 499 396.90 12.92 NA
## 500 395.77 15.10 17.5
## 501 396.90 14.33 16.8
## 502 391.99 9.67 22.4
## 503 396.90 9.08 NA
## 504 396.90 5.64 23.9
## 505 393.45 6.48 22.0
## 506 396.90 7.88 11.9
```

Impute data using Central measure (median)

```
median(mdata$crim, na.rm=T)
```

```
## [1] 0.25199
```

```
mdata$crim = ifelse(is.na(mdata$crim), median(mdata$crim, na.rm=T), mdata$crim)
mdata
```

##	X	crim	zn	indus	chas	nox	rm	age	dis	rad	tax	ptratio
## 1	1	0.25199	18.0	2.31	0	0.5380	6.575	65.2	4.0900	1	296	15.3
## 2	2	0.02731	0.0	7.07	0	0.4690	6.421	78.9	4.9671	2	242	17.8
## 3	3	0.02729	0.0	7.07	0	0.4690	7.185	61.1	4.9671	2	242	17.8
## 4	4	0.03237	0.0	NA	0	0.4580	6.998	45.8	6.0622	3	222	18.7
## 5	5	0.06905	0.0	2.18	0	0.4580	7.147	54.2	6.0622	3	222	18.7
## 6	6	0.25199	0.0	2.18	0	0.4580	6.430	58.7	6.0622	3	222	18.7
## 7	7	0.08829	12.5	7.87	0	0.5240	6.012	66.6	5.5605	5	311	15.2
## 8	8	0.14455	12.5	7.87	0	0.5240	6.172	96.1	5.9505	5	311	15.2
## 9	9	0.25199	12.5	7.87	0	0.5240	5.631	100.0	6.0821	5	311	15.2
## 10	10	0.17004	12.5	7.87	0	0.5240	6.004	85.9	6.5921	5	311	15.2
## 11	11	0.22489	12.5	7.87	0	0.5240	6.377	94.3	6.3467	5	311	15.2
## 12	12	0.11747	12.5	7.87	0	0.5240	6.009	82.9	6.2267	5	311	15.2
## 13	13	0.09378	12.5	7.87	0	0.5240	5.889	39.0	5.4509	5	311	15.2
## 14	14	0.25199	0.0	8.14	0	0.5380	5.949	61.8	4.7075	4	307	21.0
## 15	15	0.63796	0.0	8.14	0	0.5380	6.096	84.5	4.4619	4	307	21.0
## 16	16	0.62739	0.0	8.14	0	0.5380	5.834	56.5	4.4986	4	307	21.0
## 17	17	1.05393	0.0	8.14	0	0.5380	5.935	29.3	4.4986	4	307	21.0
## 18	18	0.78420	0.0	8.14	0	0.5380	5.990	81.7	4.2579	4	307	21.0
## 19	19	0.80271	0.0	8.14	0	0.5380	5.456	36.6	3.7965	4	307	21.0
## 20	20	0.72580	0.0	8.14	0	0.5380	5.727	69.5	3.7965	4	307	21.0
## 21	21	1.25179	0.0	8.14	0	0.5380	5.570	98.1	3.7979	4	307	21.0
## 22	22	0.25199	0.0	8.14	0	0.5380	5.965	89.2	4.0123	4	307	21.0
## 23	23	1.23247	0.0	8.14	0	0.5380	6.142	91.7	3.9769	4	307	21.0
## 24	24	0.98843	0.0	8.14	0	0.5380	5.813	100.0	4.0952	4	307	21.0
## 25	25	0.75026	0.0	8.14	0	0.5380	5.924	94.1	4.3996	4	307	21.0
## 26	26	0.84054	0.0	8.14	0	0.5380	5.599	85.7	4.4546	4	307	21.0
## 27	27	0.67191	0.0	8.14	0	0.5380	5.813	90.3	4.6820	4	307	21.0
## 28	28	0.95577	0.0	8.14	0	0.5380	6.047	88.8	4.4534	4	307	21.0
## 29	29	0.77299	0.0	8.14	0	0.5380	6.495	94.4	4.4547	4	307	21.0
## 30	30	1.00245	0.0	8.14	0	0.5380	6.674	87.3	4.2390	4	307	21.0

## 31	31	1.13081	0.0	8.14	0	0.5380	5.713	94.1	4.2330	4	307	21.0
## 32	32	1.35472	0.0	8.14	0	0.5380	6.072	100.0	4.1750	4	307	21.0
## 33	33	1.38799	0.0	8.14	0	0.5380	5.950	82.0	3.9900	4	307	21.0
## 34	34	1.15172	0.0	8.14	0	0.5380	5.701	95.0	3.7872	4	307	21.0
## 35	35	1.61282	0.0	8.14	0	0.5380	6.096	96.9	3.7598	4	307	21.0
## 36	36	0.25199	0.0	5.96	0	0.4990	5.933	68.2	3.3603	5	279	19.2
## 37	37	0.09744	0.0	5.96	0	0.4990	5.841	61.4	3.3779	5	279	19.2
## 38	38	0.08014	0.0	5.96	0	0.4990	5.850	41.5	3.9342	5	279	19.2
## 39	39	0.17505	0.0	5.96	0	0.4990	5.966	30.2	3.8473	5	279	19.2
## 40	40	0.02763	75.0	2.95	0	0.4280	6.595	21.8	5.4011	3	252	18.3
## 41	41	0.03359	75.0	2.95	0	0.4280	7.024	15.8	5.4011	3	252	18.3
## 42	42	0.12744	0.0	6.91	0	0.4480	6.770	2.9	5.7209	3	233	17.9
## 43	43	0.14150	0.0	6.91	0	0.4480	6.169	6.6	5.7209	3	233	17.9
## 44	44	0.15936	0.0	6.91	0	0.4480	6.211	6.5	5.7209	3	233	17.9
## 45	45	0.12269	0.0	6.91	0	0.4480	6.069	40.0	5.7209	3	233	17.9
## 46	46	0.17142	0.0	6.91	0	0.4480	5.682	33.8	5.1004	3	233	17.9
## 47	47	0.18836	0.0	6.91	0	0.4480	5.786	33.3	5.1004	3	233	17.9
## 48	48	0.22927	0.0	6.91	0	0.4480	NA	85.5	5.6894	3	233	17.9
## 49	49	0.25387	0.0	6.91	0	0.4480	5.399	95.3	5.8700	3	233	17.9
## 50	50	0.21977	0.0	6.91	0	0.4480	5.602	62.0	6.0877	3	233	17.9
## 51	51	0.08873	21.0	5.64	0	0.4390	5.963	45.7	6.8147	4	243	16.8
## 52	52	0.04337	21.0	5.64	0	0.4390	6.115	63.0	6.8147	4	243	16.8
## 53	53	0.05360	21.0	5.64	0	0.4390	6.511	21.1	6.8147	4	243	16.8
## 54	54	0.04981	21.0	5.64	0	0.4390	5.998	21.4	6.8147	4	243	16.8
## 55	55	0.25199	75.0	4.00	0	0.4100	5.888	47.6	7.3197	3	469	21.1
## 56	56	0.01311	90.0	1.22	0	0.4030	7.249	21.9	8.6966	5	226	17.9
## 57	57	0.02055	85.0	0.74	0	0.4100	6.383	35.7	9.1876	2	313	17.3
## 58	58	0.01432	100.0	1.32	0	0.4110	6.816	40.5	8.3248	5	256	15.1
## 59	59	0.15445	25.0	5.13	0	0.4530	6.145	29.2	7.8148	8	284	19.7
## 60	60	0.10328	25.0	5.13	0	0.4530	5.927	47.2	6.9320	8	284	19.7
## 61	61	0.25199	25.0	5.13	0	0.4530	5.741	66.2	7.2254	8	284	19.7
## 62	62	0.17171	25.0	5.13	0	0.4530	5.966	93.4	6.8185	8	284	19.7
## 63	63	0.11027	25.0	5.13	0	0.4530	6.456	67.8	7.2255	8	284	19.7
## 64	64	0.12650	25.0	5.13	0	0.4530	6.762	43.4	7.9809	8	284	19.7
## 65	65	0.01951	17.5	1.38	0	0.4161	7.104	59.5	9.2229	3	216	18.6
## 66	66	0.03584	80.0	NA	0	0.3980	6.290	17.8	6.6115	4	337	16.1
## 67	67	0.04379	80.0	3.37	0	0.3980	5.787	31.1	6.6115	4	337	16.1
## 68	68	0.05789	12.5	6.07	0	0.4090	5.878	21.4	6.4980	4	345	18.9
## 69	69	0.13554	12.5	6.07	0	0.4090	5.594	36.8	6.4980	4	345	18.9
## 70	70	0.25199	12.5	6.07	0	0.4090	5.885	33.0	6.4980	4	345	18.9
## 71	71	0.08826	0.0	10.81	0	0.4130	6.417	6.6	5.2873	4	305	19.2
## 72	72	0.15876	0.0	10.81	0	0.4130	5.961	17.5	5.2873	4	305	19.2
## 73	73	0.09164	0.0	10.81	0	0.4130	6.065	7.8	5.2873	4	305	19.2
## 74	74	0.19539	0.0	10.81	0	0.4130	6.245	6.2	5.2873	4	305	19.2
## 75	75	0.07896	0.0	12.83	0	0.4370	6.273	6.0	4.2515	5	398	18.7
## 76	76	0.09512	0.0	12.83	0	0.4370	6.286	45.0	4.5026	5	398	18.7
## 77	77	0.10153	0.0	12.83	0	0.4370	6.279	74.5	4.0522	5	398	18.7
## 78	78	0.08707	0.0	12.83	0	0.4370	6.140	45.8	4.0905	5	398	18.7
## 79	79	0.05646	0.0	12.83	0	0.4370	6.232	53.7	5.0141	5	398	18.7
## 80	80	0.08387	0.0	12.83	0	0.4370	5.874	36.6	4.5026	5	398	18.7
## 81	81	0.04113	25.0	4.86	0	0.4260	6.727	33.5	5.4007	4	281	19.0
## 82	82	0.25199	25.0	4.86	0	0.4260	6.619	70.4	5.4007	4	281	19.0
## 83	83	0.03659	25.0	4.86	0	0.4260	6.302	32.2	5.4007	4	281	19.0
## 84	84	0.25199	25.0	4.86	0	0.4260	6.167	46.7	5.4007	4	281	19.0

## 85	85	0.05059	0.0	4.49	0	0.4490	6.389	48.0	4.7794	3	247	18.5
## 86	86	0.05735	0.0	4.49	0	0.4490	6.630	56.1	4.4377	3	247	18.5
## 87	87	0.05188	0.0	4.49	0	0.4490	6.015	45.1	4.4272	3	247	18.5
## 88	88	0.07151	0.0	4.49	0	0.4490	6.121	56.8	3.7476	3	247	18.5
## 89	89	0.05660	0.0	3.41	0	0.4890	7.007	86.3	3.4217	2	270	17.8
## 90	90	0.05302	0.0	3.41	0	0.4890	7.079	63.1	3.4145	2	270	17.8
## 91	91	0.04684	0.0	3.41	0	0.4890	6.417	66.1	3.0923	2	270	17.8
## 92	92	0.03932	0.0	3.41	0	0.4890	6.405	73.9	3.0921	2	270	17.8
## 93	93	0.04203	28.0	15.04	0	0.4640	6.442	53.6	3.6659	4	270	18.2
## 94	94	0.25199	28.0	15.04	0	0.4640	6.211	28.9	3.6659	4	270	18.2
## 95	95	0.04294	28.0	15.04	0	0.4640	6.249	77.3	3.6150	4	270	18.2
## 96	96	0.25199	0.0	2.89	0	0.4450	6.625	57.8	3.4952	2	276	18.0
## 97	97	0.11504	0.0	2.89	0	0.4450	6.163	69.6	3.4952	2	276	18.0
## 98	98	0.12083	0.0	2.89	0	0.4450	8.069	76.0	3.4952	2	276	18.0
## 99	99	0.08187	0.0	2.89	0	0.4450	7.820	36.9	3.4952	2	276	18.0
## 100	100	0.06860	0.0	2.89	0	0.4450	7.416	62.5	3.4952	2	276	18.0
## 101	101	0.14866	0.0	8.56	0	0.5200	6.727	79.9	2.7778	5	384	20.9
## 102	102	0.11432	0.0	8.56	0	0.5200	6.781	71.3	2.8561	5	384	20.9
## 103	103	0.25199	0.0	8.56	0	0.5200	6.405	85.4	2.7147	5	384	20.9
## 104	104	0.25199	0.0	8.56	0	0.5200	6.137	87.4	2.7147	5	384	20.9
## 105	105	0.13960	0.0	8.56	0	0.5200	6.167	90.0	2.4210	5	384	20.9
## 106	106	0.25199	0.0	8.56	0	0.5200	5.851	96.7	2.1069	5	384	20.9
## 107	107	0.17120	0.0	NA	0	0.5200	5.836	91.9	2.2110	5	384	20.9
## 108	108	0.13117	0.0	8.56	0	0.5200	6.127	85.2	2.1224	5	384	20.9
## 109	109	0.12802	0.0	8.56	0	0.5200	6.474	97.1	2.4329	5	384	20.9
## 110	110	0.26363	0.0	8.56	0	0.5200	6.229	91.2	2.5451	5	384	20.9
## 111	111	0.10793	0.0	8.56	0	0.5200	6.195	54.4	2.7778	5	384	20.9
## 112	112	0.10084	0.0	10.01	0	0.5470	6.715	81.6	2.6775	6	432	17.8
## 113	113	0.12329	0.0	10.01	0	0.5470	5.913	92.9	2.3534	6	432	17.8
## 114	114	0.22212	0.0	10.01	0	0.5470	6.092	95.4	2.5480	6	432	17.8
## 115	115	0.14231	0.0	10.01	0	0.5470	6.254	84.2	2.2565	6	432	17.8
## 116	116	0.17134	0.0	10.01	0	0.5470	5.928	88.2	2.4631	6	432	17.8
## 117	117	0.13158	0.0	10.01	0	0.5470	6.176	72.5	2.7301	6	432	17.8
## 118	118	0.15098	0.0	10.01	0	0.5470	6.021	82.6	2.7474	6	432	17.8
## 119	119	0.13058	0.0	10.01	0	0.5470	5.872	73.1	2.4775	6	432	17.8
## 120	120	0.14476	0.0	10.01	0	0.5470	5.731	65.2	2.7592	6	432	17.8
## 121	121	0.06899	0.0	25.65	0	0.5810	5.870	69.7	2.2577	2	188	19.1
## 122	122	0.07165	0.0	25.65	0	0.5810	6.004	84.1	2.1974	2	188	19.1
## 123	123	0.09299	0.0	25.65	0	0.5810	5.961	92.9	2.0869	2	188	19.1
## 124	124	0.25199	0.0	25.65	0	0.5810	5.856	97.0	1.9444	2	188	19.1
## 125	125	0.09849	0.0	25.65	0	0.5810	5.879	95.8	2.0063	2	188	19.1
## 126	126	0.16902	0.0	25.65	0	0.5810	5.986	88.4	1.9929	2	188	19.1
## 127	127	0.38735	0.0	25.65	0	0.5810	5.613	95.6	1.7572	2	188	19.1
## 128	128	0.25915	0.0	21.89	0	0.6240	5.693	96.0	1.7883	4	437	21.2
## 129	129	0.25199	0.0	21.89	0	0.6240	6.431	98.8	1.8125	4	437	21.2
## 130	130	0.25199	0.0	21.89	0	0.6240	5.637	94.7	1.9799	4	437	21.2
## 131	131	0.34006	0.0	21.89	0	0.6240	6.458	98.9	2.1185	4	437	21.2
## 132	132	1.19294	0.0	21.89	0	0.6240	6.326	97.7	2.2710	4	437	21.2
## 133	133	0.25199	0.0	21.89	0	0.6240	6.372	97.9	2.3274	4	437	21.2
## 134	134	0.32982	0.0	21.89	0	0.6240	5.822	95.4	2.4699	4	437	21.2
## 135	135	0.25199	0.0	21.89	0	0.6240	5.757	98.4	2.3460	4	437	21.2
## 136	136	0.55778	0.0	21.89	0	0.6240	6.335	98.2	2.1107	4	437	21.2
## 137	137	0.32264	0.0	21.89	0	0.6240	5.942	93.5	1.9669	4	437	21.2
## 138	138	0.35233	0.0	21.89	0	0.6240	6.454	98.4	1.8498	4	437	21.2

##	139	139	0.24980	0.0	21.89	0	0.6240	5.857	98.2	1.6686	4	437	21.2
##	140	140	0.54452	0.0	21.89	0	0.6240	6.151	97.9	1.6687	4	437	21.2
##	141	141	0.29090	0.0	21.89	0	0.6240	6.174	93.6	1.6119	4	437	21.2
##	142	142	1.62864	0.0	21.89	0	0.6240	5.019	100.0	1.4394	4	437	21.2
##	143	143	3.32105	0.0	19.58	1	0.8710	5.403	100.0	1.3216	5	403	14.7
##	144	144	4.09740	0.0	19.58	0	0.8710	5.468	100.0	1.4118	5	403	14.7
##	145	145	2.77974	0.0	19.58	0	0.8710	4.903	97.8	1.3459	5	403	14.7
##	146	146	2.37934	0.0	19.58	0	0.8710	6.130	100.0	1.4191	5	403	14.7
##	147	147	2.15505	0.0	19.58	0	0.8710	5.628	100.0	1.5166	5	403	14.7
##	148	148	2.36862	0.0	19.58	0	0.8710	4.926	95.7	1.4608	5	403	14.7
##	149	149	2.33099	0.0	19.58	0	0.8710	5.186	93.8	1.5296	5	403	14.7
##	150	150	0.25199	0.0	19.58	0	0.8710	5.597	94.9	1.5257	5	403	14.7
##	151	151	1.65660	0.0	19.58	0	0.8710	6.122	97.3	1.6180	5	403	14.7
##	152	152	0.25199	0.0	19.58	0	0.8710	5.404	100.0	1.5916	5	403	14.7
##	153	153	1.12658	0.0	19.58	1	0.8710	5.012	88.0	1.6102	5	403	14.7
##	154	154	2.14918	0.0	19.58	0	0.8710	5.709	98.5	1.6232	5	403	14.7
##	155	155	1.41385	0.0	19.58	1	0.8710	6.129	96.0	1.7494	5	403	14.7
##	156	156	3.53501	0.0	19.58	1	0.8710	6.152	82.6	1.7455	5	403	14.7
##	157	157	0.25199	0.0	19.58	0	0.8710	5.272	94.0	1.7364	5	403	14.7
##	158	158	1.22358	0.0	19.58	0	0.6050	6.943	97.4	1.8773	5	403	14.7
##	159	159	1.34284	0.0	19.58	0	0.6050	NA	100.0	1.7573	5	403	14.7
##	160	160	0.25199	0.0	19.58	0	0.8710	6.510	100.0	1.7659	5	403	14.7
##	161	161	1.27346	0.0	19.58	1	0.6050	6.250	92.6	1.7984	5	403	14.7
##	162	162	1.46336	0.0	19.58	0	0.6050	7.489	90.8	1.9709	5	403	14.7
##	163	163	0.25199	0.0	19.58	1	0.6050	7.802	98.2	2.0407	5	403	14.7
##	164	164	1.51902	0.0	19.58	1	0.6050	8.375	93.9	2.1620	5	403	14.7
##	165	165	2.24236	0.0	19.58	0	0.6050	5.854	91.8	2.4220	5	403	14.7
##	166	166	2.92400	0.0	19.58	0	0.6050	6.101	93.0	2.2834	5	403	14.7
##	167	167	2.01019	0.0	19.58	0	0.6050	7.929	96.2	2.0459	5	403	14.7
##	168	168	1.80028	0.0	19.58	0	0.6050	5.877	79.2	2.4259	5	403	14.7
##	169	169	2.30040	0.0	19.58	0	0.6050	6.319	96.1	2.1000	5	403	14.7
##	170	170	2.44953	0.0	19.58	0	0.6050	6.402	95.2	2.2625	5	403	14.7
##	171	171	0.25199	0.0	19.58	0	0.6050	5.875	94.6	2.4259	5	403	14.7
##	172	172	2.31390	0.0	19.58	0	0.6050	5.880	97.3	2.3887	5	403	14.7
##	173	173	0.13914	0.0	4.05	0	0.5100	5.572	88.5	2.5961	5	296	16.6
##	174	174	0.25199	0.0	4.05	0	0.5100	6.416	84.1	2.6463	5	296	16.6
##	175	175	0.08447	0.0	4.05	0	0.5100	5.859	68.7	2.7019	5	296	16.6
##	176	176	0.06664	0.0	4.05	0	0.5100	6.546	33.1	3.1323	5	296	16.6
##	177	177	0.07022	0.0	4.05	0	0.5100	6.020	47.2	3.5549	5	296	16.6
##	178	178	0.05425	0.0	4.05	0	0.5100	6.315	73.4	3.3175	5	296	16.6
##	179	179	0.06642	0.0	4.05	0	0.5100	6.860	74.4	2.9153	5	296	16.6
##	180	180	0.05780	0.0	2.46	0	0.4880	6.980	58.4	2.8290	3	193	17.8
##	181	181	0.25199	0.0	2.46	0	0.4880	7.765	83.3	2.7410	3	193	17.8
##	182	182	0.06888	0.0	2.46	0	0.4880	6.144	62.2	2.5979	3	193	17.8
##	183	183	0.09103	0.0	2.46	0	0.4880	7.155	92.2	2.7006	3	193	17.8
##	184	184	0.10008	0.0	2.46	0	0.4880	6.563	95.6	2.8470	3	193	17.8
##	185	185	0.08308	0.0	2.46	0	0.4880	5.604	89.8	2.9879	3	193	17.8
##	186	186	0.06047	0.0	2.46	0	0.4880	6.153	68.8	3.2797	3	193	17.8
##	187	187	0.05602	0.0	NA	0	0.4880	7.831	53.6	3.1992	3	193	17.8
##	188	188	0.07875	45.0	3.44	0	0.4370	6.782	41.1	3.7886	5	398	15.2
##	189	189	0.12579	45.0	3.44	0	0.4370	6.556	29.1	4.5667	5	398	15.2
##	190	190	0.08370	45.0	3.44	0	0.4370	7.185	38.9	4.5667	5	398	15.2
##	191	191	0.09068	45.0	3.44	0	0.4370	6.951	21.5	6.4798	5	398	15.2
##	192	192	0.06911	45.0	3.44	0	0.4370	6.739	30.8	6.4798	5	398	15.2

##	193	193	0.08664	45.0	3.44	0	0.4370	7.178	26.3	6.4798	5	398	15.2
##	194	194	0.02187	60.0	2.93	0	0.4010	6.800	9.9	6.2196	1	265	15.6
##	195	195	0.01439	60.0	2.93	0	0.4010	6.604	18.8	6.2196	1	265	15.6
##	196	196	0.01381	80.0	0.46	0	0.4220	7.875	32.0	5.6484	4	255	14.4
##	197	197	0.04011	80.0	1.52	0	0.4040	7.287	34.1	7.3090	2	329	12.6
##	198	198	0.04666	80.0	1.52	0	0.4040	7.107	36.6	7.3090	2	329	12.6
##	199	199	0.03768	80.0	1.52	0	0.4040	7.274	38.3	7.3090	2	329	12.6
##	200	200	0.03150	95.0	1.47	0	0.4030	6.975	15.3	7.6534	3	402	17.0
##	201	201	0.25199	95.0	1.47	0	0.4030	7.135	13.9	7.6534	3	402	17.0
##	202	202	0.03445	82.5	2.03	0	0.4150	6.162	38.4	6.2700	2	348	14.7
##	203	203	0.02177	82.5	2.03	0	0.4150	7.610	15.7	6.2700	2	348	14.7
##	204	204	0.03510	95.0	2.68	0	0.4161	7.853	33.2	5.1180	4	224	14.7
##	205	205	0.02009	95.0	2.68	0	0.4161	8.034	31.9	5.1180	4	224	14.7
##	206	206	0.13642	0.0	10.59	0	0.4890	5.891	22.3	3.9454	4	277	18.6
##	207	207	0.25199	0.0	10.59	0	0.4890	6.326	52.5	4.3549	4	277	18.6
##	208	208	0.25199	0.0	10.59	0	0.4890	5.783	72.7	4.3549	4	277	18.6
##	209	209	0.13587	0.0	10.59	1	0.4890	6.064	59.1	4.2392	4	277	18.6
##	210	210	0.43571	0.0	10.59	1	0.4890	5.344	100.0	3.8750	4	277	18.6
##	211	211	0.17446	0.0	10.59	1	0.4890	5.960	92.1	3.8771	4	277	18.6
##	212	212	0.37578	0.0	10.59	1	0.4890	5.404	88.6	3.6650	4	277	18.6
##	213	213	0.21719	0.0	10.59	1	0.4890	5.807	53.8	3.6526	4	277	18.6
##	214	214	0.14052	0.0	10.59	0	0.4890	6.375	32.3	3.9454	4	277	18.6
##	215	215	0.28955	0.0	10.59	0	0.4890	5.412	9.8	3.5875	4	277	18.6
##	216	216	0.19802	0.0	10.59	0	0.4890	6.182	42.4	3.9454	4	277	18.6
##	217	217	0.04560	0.0	13.89	1	0.5500	5.888	56.0	3.1121	5	276	16.4
##	218	218	0.07013	0.0	13.89	0	0.5500	6.642	85.1	3.4211	5	276	16.4
##	219	219	0.11069	0.0	13.89	1	0.5500	5.951	93.8	2.8893	5	276	16.4
##	220	220	0.11425	0.0	13.89	1	0.5500	6.373	92.4	3.3633	5	276	16.4
##	221	221	0.35809	0.0	6.20	1	0.5070	6.951	88.5	2.8617	8	307	17.4
##	222	222	0.40771	0.0	6.20	1	0.5070	6.164	91.3	3.0480	8	307	17.4
##	223	223	0.62356	0.0	6.20	1	0.5070	6.879	77.7	3.2721	8	307	17.4
##	224	224	0.61470	0.0	NA	0	0.5070	6.618	80.8	3.2721	8	307	17.4
##	225	225	0.25199	0.0	6.20	0	0.5040	8.266	78.3	2.8944	8	307	17.4
##	226	226	0.52693	0.0	6.20	0	0.5040	8.725	83.0	2.8944	8	307	17.4
##	227	227	0.38214	0.0	6.20	0	0.5040	8.040	86.5	3.2157	8	307	17.4
##	228	228	0.41238	0.0	6.20	0	0.5040	7.163	79.9	3.2157	8	307	17.4
##	229	229	0.29819	0.0	6.20	0	0.5040	7.686	17.0	3.3751	8	307	17.4
##	230	230	0.44178	0.0	6.20	0	0.5040	6.552	21.4	3.3751	8	307	17.4
##	231	231	0.53700	0.0	6.20	0	0.5040	5.981	68.1	3.6715	8	307	17.4
##	232	232	0.46296	0.0	6.20	0	0.5040	7.412	76.9	3.6715	8	307	17.4
##	233	233	0.57529	0.0	6.20	0	0.5070	8.337	73.3	3.8384	8	307	17.4
##	234	234	0.33147	0.0	6.20	0	0.5070	8.247	70.4	3.6519	8	307	17.4
##	235	235	0.44791	0.0	6.20	1	0.5070	6.726	66.5	3.6519	8	307	17.4
##	236	236	0.33045	0.0	6.20	0	0.5070	6.086	61.5	3.6519	8	307	17.4
##	237	237	0.52058	0.0	6.20	1	0.5070	6.631	76.5	4.1480	8	307	17.4
##	238	238	0.51183	0.0	6.20	0	0.5070	7.358	71.6	4.1480	8	307	17.4
##	239	239	0.08244	30.0	4.93	0	0.4280	6.481	18.5	6.1899	6	300	16.6
##	240	240	0.09252	30.0	4.93	0	0.4280	6.606	42.2	6.1899	6	300	16.6
##	241	241	0.11329	30.0	4.93	0	0.4280	6.897	54.3	6.3361	6	300	16.6
##	242	242	0.10612	30.0	4.93	0	0.4280	6.095	65.1	6.3361	6	300	16.6
##	243	243	0.10290	30.0	NA	0	0.4280	6.358	52.9	7.0355	6	300	16.6
##	244	244	0.12757	30.0	4.93	0	0.4280	6.393	7.8	7.0355	6	300	16.6
##	245	245	0.20608	22.0	5.86	0	0.4310	5.593	76.5	7.9549	7	330	19.1
##	246	246	0.19133	22.0	5.86	0	0.4310	5.605	70.2	7.9549	7	330	19.1

##	247	247	0.33983	22.0	5.86	0	0.4310	6.108	34.9	8.0555	7	330	19.1
##	248	248	0.19657	22.0	5.86	0	0.4310	6.226	79.2	8.0555	7	330	19.1
##	249	249	0.16439	22.0	5.86	0	0.4310	6.433	49.1	7.8265	7	330	19.1
##	250	250	0.19073	22.0	5.86	0	0.4310	6.718	17.5	7.8265	7	330	19.1
##	251	251	0.14030	22.0	5.86	0	0.4310	6.487	13.0	7.3967	7	330	19.1
##	252	252	0.21409	22.0	5.86	0	0.4310	6.438	8.9	7.3967	7	330	19.1
##	253	253	0.08221	22.0	5.86	0	0.4310	6.957	6.8	8.9067	7	330	19.1
##	254	254	0.36894	22.0	5.86	0	0.4310	8.259	8.4	8.9067	7	330	19.1
##	255	255	0.04819	80.0	3.64	0	0.3920	6.108	32.0	9.2203	1	315	16.4
##	256	256	0.03548	80.0	3.64	0	0.3920	5.876	19.1	9.2203	1	315	16.4
##	257	257	0.01538	90.0	3.75	0	0.3940	7.454	34.2	6.3361	3	244	15.9
##	258	258	0.25199	20.0	3.97	0	0.6470	8.704	86.9	1.8010	5	264	13.0
##	259	259	0.66351	20.0	3.97	0	0.6470	7.333	100.0	1.8946	5	264	13.0
##	260	260	0.65665	20.0	3.97	0	0.6470	6.842	100.0	2.0107	5	264	13.0
##	261	261	0.54011	20.0	3.97	0	0.6470	7.203	81.8	2.1121	5	264	13.0
##	262	262	0.53412	20.0	3.97	0	0.6470	7.520	89.4	2.1398	5	264	13.0
##	263	263	0.52014	20.0	3.97	0	0.6470	8.398	91.5	2.2885	5	264	13.0
##	264	264	0.82526	20.0	3.97	0	0.6470	7.327	94.5	2.0788	5	264	13.0
##	265	265	0.55007	20.0	3.97	0	0.6470	7.206	91.6	1.9301	5	264	13.0
##	266	266	0.76162	20.0	3.97	0	0.6470	5.560	62.8	1.9865	5	264	13.0
##	267	267	0.78570	20.0	3.97	0	0.6470	7.014	84.6	2.1329	5	264	13.0
##	268	268	0.57834	20.0	3.97	0	0.5750	8.297	67.0	2.4216	5	264	13.0
##	269	269	0.54050	20.0	3.97	0	0.5750	7.470	52.6	2.8720	5	264	13.0
##	270	270	0.09065	20.0	6.96	1	0.4640	5.920	61.5	3.9175	3	223	18.6
##	271	271	0.29916	20.0	6.96	0	0.4640	5.856	42.1	4.4290	3	223	18.6
##	272	272	0.16211	20.0	6.96	0	0.4640	6.240	16.3	4.4290	3	223	18.6
##	273	273	0.11460	20.0	6.96	0	0.4640	6.538	58.7	3.9175	3	223	18.6
##	274	274	0.22188	20.0	6.96	1	0.4640	7.691	51.8	4.3665	3	223	18.6
##	275	275	0.05644	40.0	6.41	1	0.4470	6.758	32.9	4.0776	4	254	17.6
##	276	276	0.09604	40.0	6.41	0	0.4470	6.854	42.8	4.2673	4	254	17.6
##	277	277	0.10469	40.0	6.41	1	0.4470	7.267	49.0	4.7872	4	254	17.6
##	278	278	0.06127	40.0	6.41	1	0.4470	6.826	27.6	4.8628	4	254	17.6
##	279	279	0.07978	40.0	6.41	0	0.4470	6.482	32.1	4.1403	4	254	17.6
##	280	280	0.21038	20.0	3.33	0	0.4429	6.812	32.2	4.1007	5	216	14.9
##	281	281	0.03578	20.0	3.33	0	0.4429	7.820	64.5	4.6947	5	216	14.9
##	282	282	0.03705	20.0	3.33	0	0.4429	6.968	37.2	5.2447	5	216	14.9
##	283	283	0.06129	20.0	3.33	1	0.4429	7.645	49.7	5.2119	5	216	14.9
##	284	284	0.01501	90.0	1.21	1	0.4010	7.923	24.8	5.8850	1	198	13.6
##	285	285	0.00906	90.0	2.97	0	0.4000	7.088	20.8	7.3073	1	285	15.3
##	286	286	0.01096	55.0	2.25	0	0.3890	6.453	31.9	7.3073	1	300	15.3
##	287	287	0.01965	80.0	1.76	0	0.3850	6.230	31.5	9.0892	1	241	18.2
##	288	288	0.03871	52.5	5.32	0	0.4050	6.209	31.3	7.3172	6	293	16.6
##	289	289	0.04590	52.5	NA	0	0.4050	6.315	45.6	7.3172	6	293	16.6
##	290	290	0.04297	52.5	5.32	0	0.4050	6.565	22.9	7.3172	6	293	16.6
##	291	291	0.03502	80.0	4.95	0	0.4110	6.861	27.9	5.1167	4	245	19.2
##	292	292	0.07886	80.0	4.95	0	0.4110	7.148	27.7	5.1167	4	245	19.2
##	293	293	0.03615	80.0	4.95	0	0.4110	6.630	23.4	5.1167	4	245	19.2
##	294	294	0.08265	0.0	13.92	0	0.4370	6.127	18.4	5.5027	4	289	16.0
##	295	295	0.25199	0.0	13.92	0	0.4370	6.009	42.3	5.5027	4	289	16.0
##	296	296	0.12932	0.0	13.92	0	0.4370	6.678	31.1	5.9604	4	289	16.0
##	297	297	0.05372	0.0	13.92	0	0.4370	6.549	51.0	5.9604	4	289	16.0
##	298	298	0.14103	0.0	13.92	0	0.4370	5.790	58.0	6.3200	4	289	16.0
##	299	299	0.06466	70.0	2.24	0	0.4000	6.345	20.1	7.8278	5	358	14.8
##	300	300	0.05561	70.0	2.24	0	0.4000	7.041	10.0	7.8278	5	358	14.8

##	301	301	0.04417	70.0	2.24	0	0.4000	6.871	47.4	7.8278	5	358	14.8
##	302	302	0.03537	34.0	6.09	0	0.4330	6.590	40.4	5.4917	7	329	16.1
##	303	303	0.09266	34.0	6.09	0	0.4330	6.495	18.4	5.4917	7	329	16.1
##	304	304	0.10000	34.0	6.09	0	0.4330	6.982	17.7	5.4917	7	329	16.1
##	305	305	0.05515	33.0	2.18	0	0.4720	7.236	41.1	4.0220	7	222	18.4
##	306	306	0.05479	33.0	2.18	0	0.4720	6.616	58.1	3.3700	7	222	18.4
##	307	307	0.07503	33.0	2.18	0	0.4720	7.420	71.9	3.0992	7	222	18.4
##	308	308	0.04932	33.0	2.18	0	0.4720	6.849	70.3	3.1827	7	222	18.4
##	309	309	0.49298	0.0	9.90	0	0.5440	6.635	82.5	3.3175	4	304	18.4
##	310	310	0.25199	0.0	9.90	0	0.5440	5.972	76.7	3.1025	4	304	18.4
##	311	311	0.25199	0.0	9.90	0	0.5440	4.973	37.8	2.5194	4	304	18.4
##	312	312	0.79041	0.0	9.90	0	0.5440	6.122	52.8	2.6403	4	304	18.4
##	313	313	0.26169	0.0	9.90	0	0.5440	6.023	90.4	2.8340	4	304	18.4
##	314	314	0.26938	0.0	9.90	0	0.5440	6.266	82.8	3.2628	4	304	18.4
##	315	315	0.36920	0.0	9.90	0	0.5440	6.567	87.3	3.6023	4	304	18.4
##	316	316	0.25356	0.0	9.90	0	0.5440	5.705	77.7	3.9450	4	304	18.4
##	317	317	0.31827	0.0	9.90	0	0.5440	5.914	83.2	3.9986	4	304	18.4
##	318	318	0.24522	0.0	9.90	0	0.5440	5.782	71.7	4.0317	4	304	18.4
##	319	319	0.40202	0.0	9.90	0	0.5440	6.382	67.2	3.5325	4	304	18.4
##	320	320	0.47547	0.0	9.90	0	0.5440	6.113	58.8	4.0019	4	304	18.4
##	321	321	0.16760	0.0	7.38	0	0.4930	6.426	52.3	4.5404	5	287	19.6
##	322	322	0.18159	0.0	7.38	0	0.4930	6.376	54.3	4.5404	5	287	19.6
##	323	323	0.35114	0.0	7.38	0	0.4930	6.041	49.9	4.7211	5	287	19.6
##	324	324	0.28392	0.0	7.38	0	0.4930	5.708	74.3	4.7211	5	287	19.6
##	325	325	0.34109	0.0	7.38	0	0.4930	6.415	40.1	4.7211	5	287	19.6
##	326	326	0.19186	0.0	7.38	0	0.4930	6.431	14.7	5.4159	5	287	19.6
##	327	327	0.30347	0.0	7.38	0	0.4930	6.312	28.9	5.4159	5	287	19.6
##	328	328	0.24103	0.0	7.38	0	0.4930	6.083	43.7	5.4159	5	287	19.6
##	329	329	0.06617	0.0	3.24	0	0.4600	5.868	25.8	5.2146	4	430	16.9
##	330	330	0.06724	0.0	3.24	0	0.4600	6.333	17.2	5.2146	4	430	16.9
##	331	331	0.04544	0.0	3.24	0	0.4600	6.144	32.2	5.8736	4	430	16.9
##	332	332	0.05023	35.0	6.06	0	0.4379	5.706	28.4	6.6407	1	304	16.9
##	333	333	0.25199	35.0	NA	0	0.4379	6.031	23.3	6.6407	1	304	16.9
##	334	334	0.25199	0.0	5.19	0	0.5150	6.316	38.1	6.4584	5	224	20.2
##	335	335	0.03738	0.0	5.19	0	0.5150	6.310	38.5	6.4584	5	224	20.2
##	336	336	0.03961	0.0	5.19	0	0.5150	6.037	34.5	5.9853	5	224	20.2
##	337	337	0.03427	0.0	5.19	0	0.5150	5.869	46.3	5.2311	5	224	20.2
##	338	338	0.03041	0.0	5.19	0	0.5150	5.895	59.6	5.6150	5	224	20.2
##	339	339	0.03306	0.0	5.19	0	0.5150	6.059	37.3	4.8122	5	224	20.2
##	340	340	0.05497	0.0	5.19	0	0.5150	5.985	45.4	4.8122	5	224	20.2
##	341	341	0.06151	0.0	5.19	0	0.5150	5.968	58.5	4.8122	5	224	20.2
##	342	342	0.01301	35.0	1.52	0	0.4420	7.241	49.3	7.0379	1	284	15.5
##	343	343	0.02498	0.0	1.89	0	0.5180	6.540	59.7	6.2669	1	422	15.9
##	344	344	0.02543	55.0	3.78	0	0.4840	6.696	56.4	5.7321	5	370	17.6
##	345	345	0.03049	55.0	3.78	0	0.4840	6.874	28.1	6.4654	5	370	17.6
##	346	346	0.03113	0.0	4.39	0	0.4420	6.014	48.5	8.0136	3	352	18.8
##	347	347	0.25199	0.0	4.39	0	0.4420	5.898	52.3	8.0136	3	352	18.8
##	348	348	0.01870	85.0	4.15	0	0.4290	6.516	27.7	8.5353	4	351	17.9
##	349	349	0.25199	80.0	2.01	0	0.4350	6.635	29.7	8.3440	4	280	17.0
##	350	350	0.02899	40.0	1.25	0	0.4290	6.939	34.5	8.7921	1	335	19.7
##	351	351	0.06211	40.0	1.25	0	0.4290	6.490	44.4	8.7921	1	335	19.7
##	352	352	0.07950	60.0	1.69	0	0.4110	6.579	35.9	10.7103	4	411	18.3
##	353	353	0.07244	60.0	1.69	0	0.4110	5.884	18.5	10.7103	4	411	18.3
##	354	354	0.01709	90.0	2.02	0	0.4100	6.728	36.1	12.1265	5	187	17.0

##	355	355	0.04301	80.0	1.91	0	0.4130	5.663	21.9	10.5857	4	334	22.0
##	356	356	0.10659	80.0	1.91	0	0.4130	5.936	19.5	10.5857	4	334	22.0
##	357	357	8.98296	0.0	18.10	1	0.7700	6.212	97.4	2.1222	24	666	20.2
##	358	358	3.84970	0.0	18.10	1	0.7700	6.395	91.0	2.5052	24	666	20.2
##	359	359	5.20177	0.0	18.10	1	0.7700	6.127	83.4	2.7227	24	666	20.2
##	360	360	4.26131	0.0	18.10	0	0.7700	6.112	81.3	2.5091	24	666	20.2
##	361	361	4.54192	0.0	18.10	0	0.7700	6.398	88.0	2.5182	24	666	20.2
##	362	362	3.83684	0.0	18.10	0	0.7700	6.251	91.1	2.2955	24	666	20.2
##	363	363	3.67822	0.0	18.10	0	0.7700	5.362	96.2	2.1036	24	666	20.2
##	364	364	0.25199	0.0	18.10	1	0.7700	5.803	89.0	1.9047	24	666	20.2
##	365	365	0.25199	0.0	18.10	1	0.7180	8.780	82.9	1.9047	24	666	20.2
##	366	366	0.25199	0.0	18.10	0	0.7180	3.561	87.9	1.6132	24	666	20.2
##	367	367	3.69695	0.0	18.10	0	0.7180	4.963	91.4	1.7523	24	666	20.2
##	368	368	13.52220	0.0	18.10	0	0.6310	3.863	100.0	1.5106	24	666	20.2
##	369	369	4.89822	0.0	18.10	0	0.6310	4.970	100.0	1.3325	24	666	20.2
##	370	370	5.66998	0.0	18.10	1	0.6310	6.683	96.8	1.3567	24	666	20.2
##	371	371	6.53876	0.0	18.10	1	0.6310	7.016	97.5	1.2024	24	666	20.2
##	372	372	9.23230	0.0	18.10	0	0.6310	NA	100.0	1.1691	24	666	20.2
##	373	373	8.26725	0.0	18.10	1	0.6680	5.875	89.6	1.1296	24	666	20.2
##	374	374	11.10810	0.0	18.10	0	0.6680	4.906	100.0	1.1742	24	666	20.2
##	375	375	18.49820	0.0	18.10	0	0.6680	4.138	100.0	1.1370	24	666	20.2
##	376	376	19.60910	0.0	18.10	0	0.6710	7.313	97.9	1.3163	24	666	20.2
##	377	377	15.28800	0.0	18.10	0	0.6710	6.649	93.3	1.3449	24	666	20.2
##	378	378	9.82349	0.0	18.10	0	0.6710	6.794	98.8	1.3580	24	666	20.2
##	379	379	23.64820	0.0	18.10	0	0.6710	6.380	96.2	1.3861	24	666	20.2
##	380	380	17.86670	0.0	18.10	0	0.6710	6.223	100.0	1.3861	24	666	20.2
##	381	381	88.97620	0.0	18.10	0	0.6710	6.968	91.9	1.4165	24	666	20.2
##	382	382	15.87440	0.0	18.10	0	0.6710	6.545	99.1	1.5192	24	666	20.2
##	383	383	0.25199	0.0	18.10	0	0.7000	5.536	100.0	1.5804	24	666	20.2
##	384	384	7.99248	0.0	18.10	0	0.7000	5.520	100.0	1.5331	24	666	20.2
##	385	385	20.08490	0.0	18.10	0	0.7000	4.368	91.2	1.4395	24	666	20.2
##	386	386	16.81180	0.0	18.10	0	0.7000	5.277	98.1	1.4261	24	666	20.2
##	387	387	24.39380	0.0	18.10	0	0.7000	4.652	100.0	1.4672	24	666	20.2
##	388	388	22.59710	0.0	18.10	0	0.7000	5.000	89.5	1.5184	24	666	20.2
##	389	389	14.33370	0.0	18.10	0	0.7000	4.880	100.0	1.5895	24	666	20.2
##	390	390	8.15174	0.0	18.10	0	0.7000	5.390	98.9	1.7281	24	666	20.2
##	391	391	6.96215	0.0	18.10	0	0.7000	5.713	97.0	1.9265	24	666	20.2
##	392	392	5.29305	0.0	18.10	0	0.7000	6.051	82.5	2.1678	24	666	20.2
##	393	393	11.57790	0.0	18.10	0	0.7000	5.036	97.0	1.7700	24	666	20.2
##	394	394	8.64476	0.0	18.10	0	0.6930	6.193	92.6	1.7912	24	666	20.2
##	395	395	13.35980	0.0	18.10	0	0.6930	5.887	94.7	1.7821	24	666	20.2
##	396	396	8.71675	0.0	18.10	0	0.6930	6.471	98.8	1.7257	24	666	20.2
##	397	397	5.87205	0.0	18.10	0	0.6930	6.405	96.0	1.6768	24	666	20.2
##	398	398	7.67202	0.0	18.10	0	0.6930	5.747	98.9	1.6334	24	666	20.2
##	399	399	38.35180	0.0	18.10	0	0.6930	5.453	100.0	1.4896	24	666	20.2
##	400	400	9.91655	0.0	18.10	0	0.6930	NA	77.8	1.5004	24	666	20.2
##	401	401	25.04610	0.0	18.10	0	0.6930	5.987	100.0	1.5888	24	666	20.2
##	402	402	0.25199	0.0	18.10	0	0.6930	6.343	100.0	1.5741	24	666	20.2
##	403	403	9.59571	0.0	18.10	0	0.6930	6.404	100.0	1.6390	24	666	20.2
##	404	404	24.80170	0.0	18.10	0	0.6930	5.349	96.0	1.7028	24	666	20.2
##	405	405	41.52920	0.0	18.10	0	0.6930	5.531	85.4	1.6074	24	666	20.2
##	406	406	67.92080	0.0	18.10	0	0.6930	5.683	100.0	1.4254	24	666	20.2
##	407	407	20.71620	0.0	18.10	0	0.6590	4.138	100.0	1.1781	24	666	20.2
##	408	408	11.95110	0.0	18.10	0	0.6590	5.608	100.0	1.2852	24	666	20.2



##	409	409	7.40389	0.0	18.10	0	0.5970	5.617	97.9	1.4547	24	666	20.2
##	410	410	14.43830	0.0	18.10	0	0.5970	6.852	100.0	1.4655	24	666	20.2
##	411	411	51.13580	0.0	18.10	0	0.5970	5.757	100.0	1.4130	24	666	20.2
##	412	412	14.05070	0.0	18.10	0	0.5970	6.657	100.0	1.5275	24	666	20.2
##	413	413	18.81100	0.0	NA	0	0.5970	4.628	100.0	1.5539	24	666	20.2
##	414	414	28.65580	0.0	18.10	0	0.5970	5.155	100.0	1.5894	24	666	20.2
##	415	415	0.25199	0.0	18.10	0	0.6930	4.519	100.0	1.6582	24	666	20.2
##	416	416	18.08460	0.0	18.10	0	0.6790	6.434	100.0	1.8347	24	666	20.2
##	417	417	10.83420	0.0	18.10	0	0.6790	6.782	90.8	1.8195	24	666	20.2
##	418	418	25.94060	0.0	18.10	0	0.6790	5.304	89.1	1.6475	24	666	20.2
##	419	419	73.53410	0.0	18.10	0	0.6790	5.957	100.0	1.8026	24	666	20.2
##	420	420	11.81230	0.0	18.10	0	0.7180	6.824	76.5	1.7940	24	666	20.2
##	421	421	0.25199	0.0	18.10	0	0.7180	6.411	100.0	1.8589	24	666	20.2
##	422	422	7.02259	0.0	18.10	0	0.7180	6.006	95.3	1.8746	24	666	20.2
##	423	423	0.25199	0.0	18.10	0	0.6140	5.648	87.6	1.9512	24	666	20.2
##	424	424	7.05042	0.0	18.10	0	0.6140	6.103	85.1	2.0218	24	666	20.2
##	425	425	8.79212	0.0	18.10	0	0.5840	NA	70.6	2.0635	24	666	20.2
##	426	426	15.86030	0.0	18.10	0	0.6790	5.896	95.4	1.9096	24	666	20.2
##	427	427	12.24720	0.0	18.10	0	0.5840	5.837	59.7	1.9976	24	666	20.2
##	428	428	37.66190	0.0	18.10	0	0.6790	6.202	78.7	1.8629	24	666	20.2
##	429	429	7.36711	0.0	18.10	0	0.6790	6.193	78.1	1.9356	24	666	20.2
##	430	430	9.33889	0.0	18.10	0	0.6790	6.380	95.6	1.9682	24	666	20.2
##	431	431	8.49213	0.0	18.10	0	0.5840	6.348	86.1	2.0527	24	666	20.2
##	432	432	10.06230	0.0	18.10	0	0.5840	6.833	94.3	2.0882	24	666	20.2
##	433	433	6.44405	0.0	18.10	0	0.5840	6.425	74.8	2.2004	24	666	20.2
##	434	434	5.58107	0.0	18.10	0	0.7130	6.436	87.9	2.3158	24	666	20.2
##	435	435	0.25199	0.0	NA	0	0.7130	6.208	95.0	2.2222	24	666	20.2
##	436	436	11.16040	0.0	18.10	0	0.7400	6.629	94.6	2.1247	24	666	20.2
##	437	437	0.25199	0.0	18.10	0	0.7400	6.461	93.3	2.0026	24	666	20.2
##	438	438	0.25199	0.0	18.10	0	0.7400	6.152	100.0	1.9142	24	666	20.2
##	439	439	13.67810	0.0	18.10	0	0.7400	5.935	87.9	1.8206	24	666	20.2
##	440	440	9.39063	0.0	18.10	0	0.7400	5.627	93.9	1.8172	24	666	20.2
##	441	441	22.05110	0.0	18.10	0	0.7400	5.818	92.4	1.8662	24	666	20.2
##	442	442	9.72418	0.0	18.10	0	0.7400	6.406	97.2	2.0651	24	666	20.2
##	443	443	5.66637	0.0	18.10	0	0.7400	6.219	100.0	2.0048	24	666	20.2
##	444	444	9.96654	0.0	18.10	0	0.7400	6.485	100.0	1.9784	24	666	20.2
##	445	445	0.25199	0.0	18.10	0	0.7400	5.854	96.6	1.8956	24	666	20.2
##	446	446	10.67180	0.0	18.10	0	0.7400	6.459	94.8	1.9879	24	666	20.2
##	447	447	6.28807	0.0	18.10	0	0.7400	6.341	96.4	2.0720	24	666	20.2
##	448	448	9.92485	0.0	18.10	0	0.7400	6.251	96.6	2.1980	24	666	20.2
##	449	449	9.32909	0.0	18.10	0	0.7130	6.185	98.7	2.2616	24	666	20.2
##	450	450	7.52601	0.0	18.10	0	0.7130	6.417	98.3	2.1850	24	666	20.2
##	451	451	6.71772	0.0	18.10	0	0.7130	6.749	92.6	2.3236	24	666	20.2
##	452	452	5.44114	0.0	18.10	0	0.7130	6.655	98.2	2.3552	24	666	20.2
##	453	453	0.25199	0.0	18.10	0	0.7130	6.297	91.8	2.3682	24	666	20.2
##	454	454	8.24809	0.0	18.10	0	0.7130	7.393	99.3	2.4527	24	666	20.2
##	455	455	9.51363	0.0	18.10	0	0.7130	6.728	94.1	2.4961	24	666	20.2
##	456	456	4.75237	0.0	18.10	0	0.7130	6.525	86.5	2.4358	24	666	20.2
##	457	457	4.66883	0.0	18.10	0	0.7130	5.976	87.9	2.5806	24	666	20.2
##	458	458	8.20058	0.0	18.10	0	0.7130	5.936	80.3	2.7792	24	666	20.2
##	459	459	7.75223	0.0	18.10	0	0.7130	6.301	83.7	2.7831	24	666	20.2
##	460	460	6.80117	0.0	18.10	0	0.7130	6.081	84.4	2.7175	24	666	20.2
##	461	461	4.81213	0.0	18.10	0	0.7130	6.701	90.0	2.5975	24	666	20.2
##	462	462	3.69311	0.0	18.10	0	0.7130	6.376	88.4	2.5671	24	666	20.2

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## 463 463 6.65492 0.0 18.10 0 0.7130 6.317 83.0 2.7344 24 666 20.2
## 464 464 5.82115 0.0 18.10 0 0.7130 6.513 89.9 2.8016 24 666 20.2
## 465 465 7.83932 0.0 18.10 0 0.6550 6.209 65.4 2.9634 24 666 20.2
## 466 466 3.16360 0.0 18.10 0 0.6550 5.759 48.2 3.0665 24 666 20.2
## 467 467 3.77498 0.0 18.10 0 0.6550 5.952 84.7 2.8715 24 666 20.2
## 468 468 4.42228 0.0 18.10 0 0.5840 6.003 94.5 2.5403 24 666 20.2
## 469 469 15.57570 0.0 18.10 0 0.5800 5.926 71.0 2.9084 24 666 20.2
## 470 470 13.07510 0.0 18.10 0 0.5800 5.713 56.7 2.8237 24 666 20.2
## 471 471 4.34879 0.0 18.10 0 0.5800 6.167 84.0 3.0334 24 666 20.2
## 472 472 4.03841 0.0 18.10 0 0.5320 6.229 90.7 3.0993 24 666 20.2
## 473 473 3.56868 0.0 18.10 0 0.5800 6.437 75.0 2.8965 24 666 20.2
## 474 474 4.64689 0.0 18.10 0 0.6140 6.980 67.6 2.5329 24 666 20.2
## 475 475 8.05579 0.0 18.10 0 0.5840 5.427 95.4 2.4298 24 666 20.2
## 476 476 6.39312 0.0 18.10 0 0.5840 6.162 97.4 2.2060 24 666 20.2
## 477 477 4.87141 0.0 18.10 0 0.6140 6.484 93.6 2.3053 24 666 20.2
## 478 478 15.02340 0.0 18.10 0 0.6140 5.304 97.3 2.1007 24 666 20.2
## 479 479 10.23300 0.0 18.10 0 0.6140 6.185 96.7 2.1705 24 666 20.2
## 480 480 14.33370 0.0 18.10 0 0.6140 6.229 88.0 1.9512 24 666 20.2
## 481 481 5.82401 0.0 18.10 0 0.5320 6.242 64.7 3.4242 24 666 20.2
## 482 482 5.70818 0.0 18.10 0 0.5320 6.750 74.9 3.3317 24 666 20.2
## 483 483 5.73116 0.0 18.10 0 0.5320 7.061 77.0 3.4106 24 666 20.2
## 484 484 2.81838 0.0 18.10 0 0.5320 5.762 40.3 4.0983 24 666 20.2
## 485 485 2.37857 0.0 18.10 0 0.5830 5.871 41.9 3.7240 24 666 20.2
## 486 486 3.67367 0.0 18.10 0 0.5830 6.312 51.9 3.9917 24 666 20.2
## 487 487 5.69175 0.0 18.10 0 0.5830 6.114 79.8 3.5459 24 666 20.2
## 488 488 4.83567 0.0 18.10 0 0.5830 5.905 53.2 3.1523 24 666 20.2
## 489 489 0.15086 0.0 27.74 0 0.6090 5.454 92.7 1.8209 4 711 20.1
## 490 490 0.18337 0.0 27.74 0 0.6090 5.414 98.3 1.7554 4 711 20.1
## 491 491 0.20746 0.0 27.74 0 0.6090 5.093 98.0 1.8226 4 711 20.1
## 492 492 0.25199 0.0 27.74 0 0.6090 5.983 98.8 1.8681 4 711 20.1
## 493 493 0.11132 0.0 27.74 0 0.6090 5.983 83.5 2.1099 4 711 20.1
## 494 494 0.17331 0.0 9.69 0 0.5850 5.707 54.0 2.3817 6 391 19.2
## 495 495 0.27957 0.0 9.69 0 0.5850 5.926 42.6 2.3817 6 391 19.2
## 496 496 0.17899 0.0 9.69 0 0.5850 5.670 28.8 2.7986 6 391 19.2
## 497 497 0.25199 0.0 9.69 0 0.5850 5.390 72.9 2.7986 6 391 19.2
## 498 498 0.26838 0.0 9.69 0 0.5850 5.794 70.6 2.8927 6 391 19.2
## 499 499 0.23912 0.0 9.69 0 0.5850 6.019 65.3 2.4091 6 391 19.2
## 500 500 0.17783 0.0 9.69 0 0.5850 5.569 73.5 2.3999 6 391 19.2
## 501 501 0.22438 0.0 9.69 0 0.5850 6.027 79.7 2.4982 6 391 19.2
## 502 502 0.06263 0.0 11.93 0 0.5730 6.593 69.1 2.4786 1 273 21.0
## 503 503 0.04527 0.0 11.93 0 0.5730 6.120 76.7 2.2875 1 273 21.0
## 504 504 0.06076 0.0 11.93 0 0.5730 6.976 91.0 2.1675 1 273 21.0
## 505 505 0.10959 0.0 11.93 0 0.5730 6.794 89.3 2.3889 1 273 21.0
## 506 506 0.04741 0.0 11.93 0 0.5730 6.030 80.8 2.5050 1 273 21.0
##
##      b lstat medv
## 1 396.90 4.98 24.0
## 2 396.90 9.14 21.6
## 3 392.83 4.03 34.7
## 4 394.63 2.94 33.4
## 5 396.90 5.33 36.2
## 6 394.12 5.21 28.7
## 7 395.60 12.43 22.9
## 8 396.90 19.15 NA
## 9 386.63 29.93 16.5

```

## 10	386.71	17.10	NA
## 11	392.52	20.45	15.0
## 12	396.90	13.27	18.9
## 13	390.50	15.71	21.7
## 14	396.90	8.26	20.4
## 15	380.02	10.26	18.2
## 16	395.62	8.47	19.9
## 17	386.85	6.58	23.1
## 18	386.75	14.67	17.5
## 19	288.99	11.69	20.2
## 20	390.95	11.28	18.2
## 21	376.57	21.02	13.6
## 22	392.53	13.83	19.6
## 23	396.90	18.72	15.2
## 24	394.54	19.88	NA
## 25	394.33	16.30	15.6
## 26	303.42	16.51	13.9
## 27	376.88	14.81	16.6
## 28	306.38	17.28	14.8
## 29	387.94	12.80	18.4
## 30	380.23	11.98	21.0
## 31	360.17	22.60	12.7
## 32	376.73	13.04	14.5
## 33	232.60	27.71	13.2
## 34	358.77	18.35	13.1
## 35	248.31	20.34	13.5
## 36	396.90	9.68	18.9
## 37	377.56	11.41	20.0
## 38	396.90	8.77	21.0
## 39	393.43	10.13	24.7
## 40	395.63	4.32	30.8
## 41	395.62	1.98	NA
## 42	385.41	4.84	26.6
## 43	383.37	5.81	25.3
## 44	394.46	7.44	24.7
## 45	389.39	9.55	21.2
## 46	396.90	10.21	19.3
## 47	396.90	14.15	NA
## 48	392.74	18.80	16.6
## 49	396.90	30.81	14.4
## 50	396.90	16.20	19.4
## 51	395.56	13.45	19.7
## 52	393.97	9.43	20.5
## 53	396.90	5.28	25.0
## 54	396.90	8.43	23.4
## 55	396.90	14.80	18.9
## 56	395.93	4.81	NA
## 57	396.90	5.77	24.7
## 58	392.90	3.95	31.6
## 59	390.68	6.86	NA
## 60	396.90	9.22	19.6
## 61	395.11	13.15	18.7
## 62	378.08	14.44	16.0
## 63	396.90	6.73	22.2

## 64	395.58	9.50	25.0
## 65	393.24	8.05	33.0
## 66	396.90	4.67	23.5
## 67	396.90	10.24	19.4
## 68	396.21	8.10	22.0
## 69	396.90	13.09	17.4
## 70	396.90	8.79	20.9
## 71	383.73	6.72	24.2
## 72	376.94	9.88	21.7
## 73	390.91	5.52	22.8
## 74	377.17	7.54	23.4
## 75	394.92	6.78	24.1
## 76	383.23	8.94	21.4
## 77	373.66	11.97	20.0
## 78	386.96	10.27	20.8
## 79	386.40	12.34	21.2
## 80	396.06	9.10	20.3
## 81	396.90	5.29	28.0
## 82	395.63	7.22	23.9
## 83	396.90	6.72	24.8
## 84	390.64	7.51	22.9
## 85	396.90	9.62	23.9
## 86	392.30	6.53	26.6
## 87	395.99	12.86	NA
## 88	395.15	8.44	NA
## 89	396.90	5.50	23.6
## 90	396.06	5.70	28.7
## 91	392.18	8.81	22.6
## 92	393.55	8.20	22.0
## 93	395.01	8.16	22.9
## 94	396.33	6.21	25.0
## 95	396.90	10.59	20.6
## 96	357.98	6.65	28.4
## 97	391.83	11.34	21.4
## 98	396.90	4.21	38.7
## 99	393.53	3.57	43.8
## 100	396.90	6.19	33.2
## 101	394.76	9.42	27.5
## 102	395.58	7.67	NA
## 103	70.80	10.63	18.6
## 104	394.47	13.44	19.3
## 105	392.69	12.33	20.1
## 106	394.05	16.47	19.5
## 107	395.67	18.66	19.5
## 108	387.69	14.09	20.4
## 109	395.24	12.27	19.8
## 110	391.23	15.55	19.4
## 111	393.49	13.00	21.7
## 112	395.59	10.16	22.8
## 113	394.95	16.21	18.8
## 114	396.90	17.09	18.7
## 115	388.74	10.45	18.5
## 116	344.91	15.76	18.3
## 117	393.30	12.04	21.2

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## 118 394.51 10.30 19.2
## 119 338.63 15.37 20.4
## 120 391.50 13.61 NA
## 121 389.15 14.37 22.0
## 122 377.67 14.27 20.3
## 123 378.09 17.93 20.5
## 124 370.31 25.41 17.3
## 125 379.38 17.58 18.8
## 126 385.02 14.81 21.4
## 127 359.29 27.26 15.7
## 128 392.11 17.19 16.2
## 129 396.90 15.39 18.0
## 130 396.90 18.34 14.3
## 131 395.04 12.60 19.2
## 132 396.90 12.26 19.6
## 133 385.76 11.12 23.0
## 134 388.69 15.03 18.4
## 135 262.76 17.31 15.6
## 136 394.67 16.96 18.1
## 137 378.25 16.90 17.4
## 138 394.08 14.59 17.1
## 139 392.04 21.32 13.3
## 140 396.90 18.46 17.8
## 141 388.08 24.16 14.0
## 142 396.90 34.41 14.4
## 143 396.90 26.82 13.4
## 144 396.90 26.42 15.6
## 145 396.90 29.29 11.8
## 146 172.91 27.80 13.8
## 147 169.27 16.65 15.6
## 148 391.71 29.53 14.6
## 149 356.99 28.32 17.8
## 150 351.85 21.45 15.4
## 151 372.80 14.10 21.5
## 152 341.60 13.28 19.6
## 153 343.28 12.12 15.3
## 154 261.95 15.79 19.4
## 155 321.02 15.12 17.0
## 156 88.01 15.02 15.6
## 157 88.63 16.14 13.1
## 158 363.43 4.59 41.3
## 159 353.89 6.43 24.3
## 160 364.31 7.39 23.3
## 161 338.92 5.50 NA
## 162 374.43 1.73 50.0
## 163 389.61 1.92 50.0
## 164 388.45 3.32 NA
## 165 395.11 11.64 22.7
## 166 240.16 9.81 25.0
## 167 369.30 3.70 50.0
## 168 227.61 12.14 23.8
## 169 297.09 11.10 23.8
## 170 330.04 11.32 22.3
## 171 292.29 14.43 17.4

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## 172 348.13 12.03 19.1
## 173 396.90 14.69 23.1
## 174 395.50 9.04 23.6
## 175 393.23 9.64 22.6
## 176 390.96 5.33 29.4
## 177 393.23 10.11 23.2
## 178 395.60 6.29 24.6
## 179 391.27 6.92 29.9
## 180 396.90 5.04 37.2
## 181 395.56 7.56 39.8
## 182 396.90 9.45 NA
## 183 394.12 4.82 37.9
## 184 396.90 5.68 32.5
## 185 391.00 13.98 26.4
## 186 387.11 13.15 29.6
## 187 392.63 4.45 50.0
## 188 393.87 6.68 32.0
## 189 382.84 4.56 29.8
## 190 396.90 5.39 34.9
## 191 377.68 5.10 37.0
## 192 389.71 4.69 30.5
## 193 390.49 2.87 36.4
## 194 393.37 5.03 31.1
## 195 376.70 4.38 29.1
## 196 394.23 2.97 NA
## 197 396.90 4.08 33.3
## 198 354.31 8.61 30.3
## 199 392.20 6.62 34.6
## 200 396.90 4.56 34.9
## 201 384.30 4.45 32.9
## 202 393.77 7.43 24.1
## 203 395.38 3.11 42.3
## 204 392.78 3.81 48.5
## 205 390.55 2.88 50.0
## 206 396.90 10.87 22.6
## 207 394.87 10.97 24.4
## 208 389.43 18.06 22.5
## 209 381.32 14.66 24.4
## 210 396.90 23.09 20.0
## 211 393.25 17.27 21.7
## 212 395.24 23.98 19.3
## 213 390.94 16.03 22.4
## 214 385.81 9.38 28.1
## 215 348.93 29.55 23.7
## 216 393.63 9.47 25.0
## 217 392.80 13.51 23.3
## 218 392.78 9.69 28.7
## 219 396.90 17.92 21.5
## 220 393.74 10.50 23.0
## 221 391.70 9.71 26.7
## 222 395.24 21.46 21.7
## 223 390.39 9.93 27.5
## 224 396.90 7.60 30.1
## 225 385.05 4.14 44.8

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## 226 382.00 4.63 50.0
## 227 387.38 3.13 37.6
## 228 372.08 6.36 31.6
## 229 377.51 3.92 46.7
## 230 380.34 3.76 31.5
## 231 378.35 11.65 24.3
## 232 376.14 5.25 31.7
## 233 385.91 2.47 41.7
## 234 378.95 3.95 48.3
## 235 360.20 8.05 29.0
## 236 376.75 10.88 24.0
## 237 388.45 9.54 25.1
## 238 390.07 4.73 31.5
## 239 379.41 6.36 23.7
## 240 383.78 7.37 23.3
## 241 391.25 11.38 22.0
## 242 394.62 12.40 20.1
## 243 372.75 11.22 22.2
## 244 374.71 5.19 23.7
## 245 372.49 12.50 17.6
## 246 389.13 18.46 18.5
## 247 390.18 9.16 24.3
## 248 376.14 10.15 20.5
## 249 374.71 9.52 24.5
## 250 393.74 6.56 NA
## 251 396.28 5.90 24.4
## 252 377.07 3.59 24.8
## 253 386.09 3.53 29.6
## 254 396.90 3.54 42.8
## 255 392.89 6.57 21.9
## 256 395.18 9.25 20.9
## 257 386.34 3.11 44.0
## 258 389.70 5.12 50.0
## 259 383.29 7.79 36.0
## 260 391.93 6.90 30.1
## 261 392.80 9.59 33.8
## 262 388.37 7.26 43.1
## 263 386.86 5.91 48.8
## 264 393.42 11.25 31.0
## 265 387.89 8.10 36.5
## 266 392.40 10.45 NA
## 267 384.07 14.79 30.7
## 268 384.54 7.44 50.0
## 269 390.30 3.16 43.5
## 270 391.34 13.65 20.7
## 271 388.65 13.00 21.1
## 272 396.90 6.59 25.2
## 273 394.96 7.73 24.4
## 274 390.77 6.58 35.2
## 275 396.90 3.53 32.4
## 276 396.90 2.98 32.0
## 277 389.25 6.05 33.2
## 278 393.45 4.16 33.1
## 279 396.90 7.19 29.1

```

```

## 280 396.90 4.85 35.1
## 281 387.31 3.76 45.4
## 282 392.23 4.59 35.4
## 283 377.07 3.01 46.0
## 284 395.52 3.16 NA
## 285 394.72 7.85 32.2
## 286 394.72 8.23 22.0
## 287 341.60 12.93 20.1
## 288 396.90 7.14 23.2
## 289 396.90 7.60 22.3
## 290 371.72 9.51 24.8
## 291 396.90 3.33 28.5
## 292 396.90 3.56 NA
## 293 396.90 4.70 27.9
## 294 396.90 8.58 23.9
## 295 396.90 10.40 21.7
## 296 396.90 6.27 28.6
## 297 392.85 7.39 27.1
## 298 396.90 15.84 20.3
## 299 368.24 4.97 22.5
## 300 371.58 4.74 29.0
## 301 390.86 6.07 24.8
## 302 395.75 9.50 22.0
## 303 383.61 8.67 26.4
## 304 390.43 4.86 33.1
## 305 393.68 6.93 NA
## 306 393.36 8.93 28.4
## 307 396.90 6.47 33.4
## 308 396.90 7.53 28.2
## 309 396.90 4.54 22.8
## 310 396.24 9.97 20.3
## 311 350.45 12.64 16.1
## 312 396.90 5.98 22.1
## 313 396.30 11.72 19.4
## 314 393.39 7.90 21.6
## 315 395.69 9.28 23.8
## 316 396.42 11.50 16.2
## 317 390.70 18.33 17.8
## 318 396.90 15.94 19.8
## 319 395.21 10.36 NA
## 320 396.23 12.73 21.0
## 321 396.90 7.20 23.8
## 322 396.90 6.87 23.1
## 323 396.90 7.70 20.4
## 324 391.13 11.74 18.5
## 325 396.90 6.12 25.0
## 326 393.68 5.08 24.6
## 327 396.90 6.15 23.0
## 328 396.90 12.79 22.2
## 329 382.44 9.97 19.3
## 330 375.21 7.34 22.6
## 331 368.57 9.09 NA
## 332 394.02 12.43 17.1
## 333 362.25 7.83 19.4

```



```

## 334 389.71 5.68 22.2
## 335 389.40 6.75 20.7
## 336 396.90 8.01 NA
## 337 396.90 9.80 19.5
## 338 394.81 10.56 18.5
## 339 396.14 8.51 20.6
## 340 396.90 9.74 19.0
## 341 396.90 9.29 18.7
## 342 394.74 5.49 32.7
## 343 389.96 8.65 16.5
## 344 396.90 7.18 23.9
## 345 387.97 4.61 31.2
## 346 385.64 10.53 17.5
## 347 364.61 12.67 17.2
## 348 392.43 6.36 23.1
## 349 390.94 5.99 24.5
## 350 389.85 5.89 26.6
## 351 396.90 5.98 22.9
## 352 370.78 5.49 24.1
## 353 392.33 7.79 18.6
## 354 384.46 4.50 NA
## 355 382.80 8.05 18.2
## 356 376.04 5.57 20.6
## 357 377.73 17.60 17.8
## 358 391.34 13.27 21.7
## 359 395.43 11.48 22.7
## 360 390.74 12.67 22.6
## 361 374.56 7.79 25.0
## 362 350.65 14.19 19.9
## 363 380.79 10.19 20.8
## 364 353.04 14.64 16.8
## 365 354.55 5.29 21.9
## 366 354.70 7.12 27.5
## 367 316.03 14.00 21.9
## 368 131.42 13.33 NA
## 369 375.52 3.26 50.0
## 370 375.33 3.73 50.0
## 371 392.05 2.96 50.0
## 372 366.15 9.53 50.0
## 373 347.88 8.88 50.0
## 374 396.90 34.77 13.8
## 375 396.90 37.97 13.8
## 376 396.90 13.44 15.0
## 377 363.02 23.24 13.9
## 378 396.90 21.24 13.3
## 379 396.90 23.69 13.1
## 380 393.74 21.78 10.2
## 381 396.90 17.21 10.4
## 382 396.90 21.08 10.9
## 383 396.90 23.60 11.3
## 384 396.90 24.56 12.3
## 385 285.83 30.63 8.8
## 386 396.90 30.81 7.2
## 387 396.90 28.28 10.5

```

```

## 388 396.90 31.99 7.4
## 389 372.92 30.62 10.2
## 390 396.90 20.85 11.5
## 391 394.43 17.11 15.1
## 392 378.38 18.76 23.2
## 393 396.90 25.68 9.7
## 394 396.90 15.17 13.8
## 395 396.90 16.35 12.7
## 396 391.98 17.12 13.1
## 397 396.90 19.37 12.5
## 398 393.10 19.92 8.5
## 399 396.90 30.59 5.0
## 400 338.16 29.97 6.3
## 401 396.90 26.77 5.6
## 402 396.90 20.32 7.2
## 403 376.11 20.31 12.1
## 404 396.90 19.77 8.3
## 405 329.46 27.38 8.5
## 406 384.97 22.98 5.0
## 407 370.22 23.34 11.9
## 408 332.09 12.13 27.9
## 409 314.64 26.40 17.2
## 410 179.36 19.78 27.5
## 411 2.60 10.11 15.0
## 412 35.05 21.22 17.2
## 413 28.79 34.37 17.9
## 414 210.97 20.08 16.3
## 415 88.27 36.98 7.0
## 416 27.25 29.05 7.2
## 417 21.57 25.79 7.5
## 418 127.36 26.64 NA
## 419 16.45 20.62 8.8
## 420 48.45 22.74 8.4
## 421 318.75 15.02 16.7
## 422 319.98 15.70 14.2
## 423 291.55 14.10 20.8
## 424 2.52 23.29 13.4
## 425 3.65 17.16 11.7
## 426 7.68 24.39 8.3
## 427 24.65 15.69 10.2
## 428 18.82 14.52 10.9
## 429 96.73 21.52 11.0
## 430 60.72 24.08 9.5
## 431 83.45 17.64 14.5
## 432 81.33 19.69 14.1
## 433 97.95 12.03 16.1
## 434 100.19 16.22 14.3
## 435 100.63 15.17 11.7
## 436 109.85 23.27 13.4
## 437 27.49 18.05 9.6
## 438 9.32 26.45 8.7
## 439 68.95 34.02 8.4
## 440 396.90 22.88 12.8
## 441 391.45 22.11 10.5

```

```

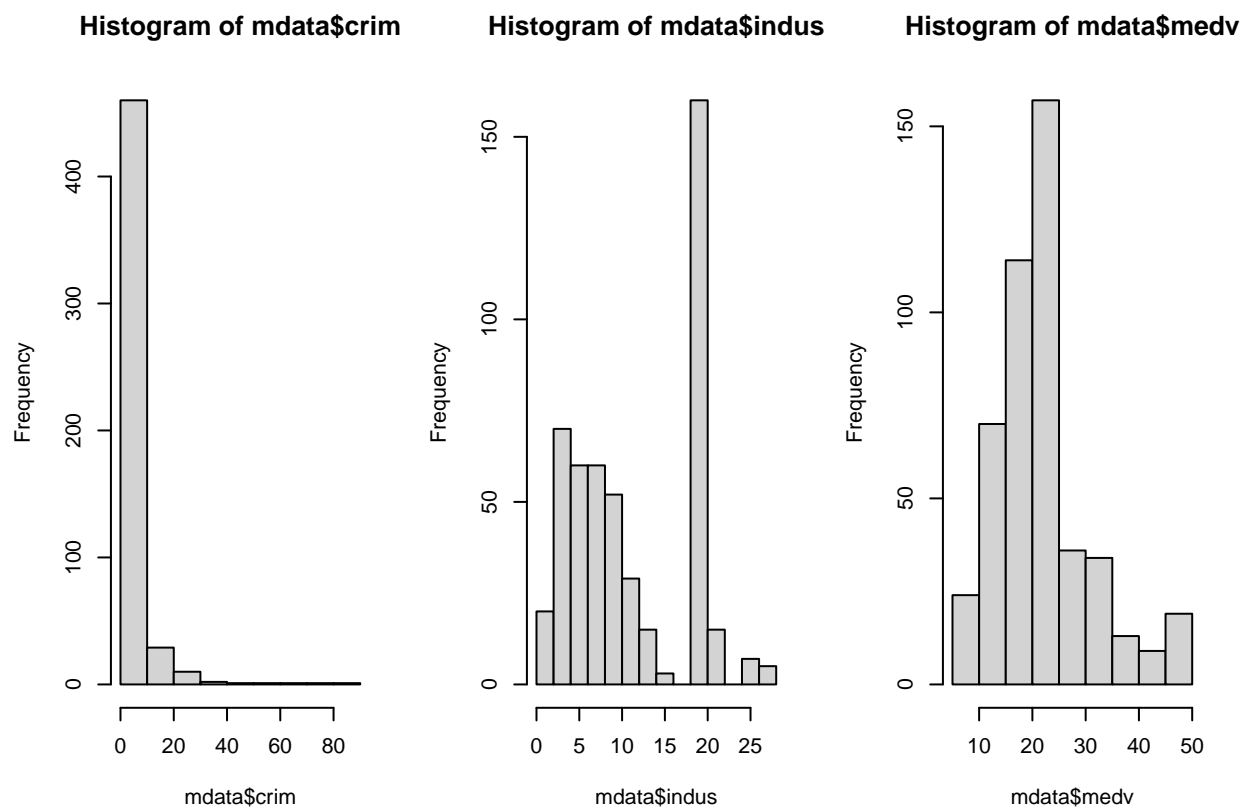
## 442 385.96 19.52 17.1
## 443 395.69 16.59 18.4
## 444 386.73 18.85 15.4
## 445 240.52 23.79 10.8
## 446 43.06 23.98 11.8
## 447 318.01 17.79 14.9
## 448 388.52 16.44 12.6
## 449 396.90 18.13 14.1
## 450 304.21 19.31 13.0
## 451 0.32 17.44 13.4
## 452 355.29 17.73 15.2
## 453 385.09 17.27 16.1
## 454 375.87 16.74 17.8
## 455 6.68 18.71 14.9
## 456 50.92 18.13 14.1
## 457 10.48 19.01 12.7
## 458 3.50 16.94 13.5
## 459 272.21 16.23 14.9
## 460 396.90 14.70 20.0
## 461 255.23 16.42 16.4
## 462 391.43 14.65 17.7
## 463 396.90 13.99 19.5
## 464 393.82 10.29 20.2
## 465 396.90 13.22 21.4
## 466 334.40 14.13 19.9
## 467 22.01 17.15 19.0
## 468 331.29 21.32 19.1
## 469 368.74 18.13 19.1
## 470 396.90 14.76 20.1
## 471 396.90 16.29 19.9
## 472 395.33 12.87 19.6
## 473 393.37 14.36 23.2
## 474 374.68 11.66 29.8
## 475 352.58 18.14 13.8
## 476 302.76 24.10 NA
## 477 396.21 18.68 16.7
## 478 349.48 24.91 12.0
## 479 379.70 18.03 14.6
## 480 383.32 13.11 21.4
## 481 396.90 10.74 23.0
## 482 393.07 7.74 23.7
## 483 395.28 7.01 25.0
## 484 392.92 10.42 21.8
## 485 370.73 13.34 20.6
## 486 388.62 10.58 21.2
## 487 392.68 14.98 19.1
## 488 388.22 11.45 20.6
## 489 395.09 18.06 15.2
## 490 344.05 23.97 7.0
## 491 318.43 29.68 8.1
## 492 390.11 18.07 13.6
## 493 396.90 13.35 20.1
## 494 396.90 12.01 21.8
## 495 396.90 13.59 24.5

```

```
## 496 393.29 17.60 NA
## 497 396.90 21.14 19.7
## 498 396.90 14.10 18.3
## 499 396.90 12.92 NA
## 500 395.77 15.10 17.5
## 501 396.90 14.33 16.8
## 502 391.99 9.67 22.4
## 503 396.90 9.08 NA
## 504 396.90 5.64 23.9
## 505 393.45 6.48 22.0
## 506 396.90 7.88 11.9
```

`na.rm` argument ask the user whether the missing value should be remove before computing the median

```
par(mfrow=c(1,3))
hist(mdata$crim)
hist(mdata$indus)
hist(mdata$medv)
```



We can see that all three histogram is not symmetry.

## K-Nearest Neighbor

```
iris_mis1 = read.csv('./Data/iris.mis1.csv')
iris_mis1
```

##	X	Sepal.Length	Sepal.Width	Petal.Length	Petal.Width
## 1	1	NA	3.5	1.4	0.2
## 2	2	4.9	3.0	1.4	0.2
## 3	3	4.7	NA	1.3	0.2
## 4	4	4.6	3.1	1.5	NA
## 5	5	5.0	3.6	1.4	0.2
## 6	6	5.4	3.9	1.7	0.4
## 7	7	4.6	3.4	1.4	0.3
## 8	8	5.0	3.4	1.5	0.2
## 9	9	4.4	NA	1.4	0.2
## 10	10	4.9	3.1	NA	0.1
## 11	11	NA	3.7	1.5	0.2
## 12	12	4.8	3.4	NA	0.2
## 13	13	4.8	3.0	1.4	0.1
## 14	14	NA	3.0	1.1	0.1
## 15	15	5.8	4.0	1.2	0.2
## 16	16	5.7	4.4	1.5	NA
## 17	17	5.4	3.9	1.3	0.4
## 18	18	5.1	3.5	1.4	0.3
## 19	19	5.7	3.8	1.7	NA
## 20	20	5.1	3.8	1.5	0.3
## 21	21	5.4	3.4	1.7	0.2
## 22	22	5.1	3.7	1.5	0.4
## 23	23	NA	3.6	1.0	0.2
## 24	24	5.1	3.3	1.7	NA
## 25	25	4.8	3.4	1.9	0.2
## 26	26	5.0	3.0	1.6	0.2
## 27	27	5.0	3.4	1.6	0.4
## 28	28	5.2	3.5	1.5	0.2
## 29	29	5.2	3.4	1.4	0.2
## 30	30	4.7	3.2	1.6	0.2
## 31	31	4.8	3.1	1.6	0.2
## 32	32	5.4	3.4	1.5	0.4
## 33	33	5.2	NA	1.5	0.1
## 34	34	5.5	4.2	1.4	0.2
## 35	35	NA	3.1	1.5	0.2
## 36	36	5.0	3.2	1.2	0.2
## 37	37	5.5	3.5	1.3	0.2
## 38	38	4.9	3.6	1.4	0.1
## 39	39	4.4	3.0	1.3	0.2
## 40	40	5.1	3.4	1.5	NA
## 41	41	5.0	3.5	1.3	0.3
## 42	42	4.5	2.3	1.3	0.3
## 43	43	4.4	3.2	1.3	0.2
## 44	44	5.0	3.5	1.6	0.6
## 45	45	5.1	3.8	1.9	0.4
## 46	46	4.8	3.0	1.4	0.3
## 47	47	5.1	3.8	NA	0.2
## 48	48	4.6	NA	1.4	0.2
## 49	49	5.3	3.7	1.5	0.2

## 50	50	5.0	3.3	1.4	0.2
## 51	51	7.0	3.2	4.7	NA
## 52	52	NA	3.2	4.5	1.5
## 53	53	6.9	NA	4.9	NA
## 54	54	5.5	2.3	NA	1.3
## 55	55	6.5	2.8	NA	1.5
## 56	56	5.7	2.8	4.5	1.3
## 57	57	6.3	3.3	4.7	1.6
## 58	58	4.9	2.4	3.3	1.0
## 59	59	6.6	2.9	NA	1.3
## 60	60	5.2	2.7	3.9	1.4
## 61	61	5.0	2.0	3.5	1.0
## 62	62	NA	3.0	4.2	1.5
## 63	63	6.0	2.2	4.0	NA
## 64	64	6.1	2.9	4.7	1.4
## 65	65	5.6	2.9	3.6	1.3
## 66	66	6.7	3.1	4.4	1.4
## 67	67	5.6	3.0	4.5	1.5
## 68	68	5.8	2.7	4.1	1.0
## 69	69	6.2	2.2	NA	1.5
## 70	70	5.6	2.5	NA	1.1
## 71	71	5.9	3.2	4.8	1.8
## 72	72	6.1	2.8	4.0	1.3
## 73	73	6.3	2.5	4.9	1.5
## 74	74	6.1	2.8	4.7	NA
## 75	75	6.4	2.9	4.3	1.3
## 76	76	NA	3.0	4.4	1.4
## 77	77	6.8	2.8	4.8	1.4
## 78	78	NA	3.0	5.0	1.7
## 79	79	NA	NA	NA	1.5
## 80	80	5.7	2.6	3.5	1.0
## 81	81	5.5	2.4	3.8	1.1
## 82	82	5.5	2.4	3.7	1.0
## 83	83	5.8	2.7	3.9	1.2
## 84	84	6.0	2.7	5.1	1.6
## 85	85	5.4	3.0	4.5	1.5
## 86	86	6.0	3.4	4.5	1.6
## 87	87	6.7	3.1	4.7	1.5
## 88	88	6.3	2.3	4.4	1.3
## 89	89	5.6	3.0	4.1	1.3
## 90	90	5.5	2.5	4.0	NA
## 91	91	5.5	2.6	4.4	1.2
## 92	92	6.1	3.0	4.6	1.4
## 93	93	5.8	2.6	4.0	1.2
## 94	94	5.0	2.3	3.3	1.0
## 95	95	5.6	2.7	4.2	1.3
## 96	96	5.7	3.0	NA	1.2
## 97	97	5.7	2.9	4.2	1.3
## 98	98	6.2	2.9	4.3	1.3
## 99	99	NA	2.5	3.0	1.1
## 100	100	5.7	2.8	4.1	1.3
## 101	101	NA	3.3	6.0	NA
## 102	102	5.8	2.7	5.1	1.9
## 103	103	NA	3.0	5.9	2.1

## 104 104	6.3	2.9	5.6	1.8
## 105 105	6.5	3.0	5.8	2.2
## 106 106	7.6	3.0	6.6	2.1
## 107 107	NA	2.5	NA	1.7
## 108 108	7.3	2.9	6.3	1.8
## 109 109	NA	NA	NA	1.8
## 110 110	NA	3.6	6.1	2.5
## 111 111	6.5	3.2	5.1	2.0
## 112 112	6.4	2.7	5.3	1.9
## 113 113	6.8	3.0	5.5	2.1
## 114 114	NA	2.5	5.0	2.0
## 115 115	5.8	2.8	5.1	2.4
## 116 116	NA	3.2	5.3	2.3
## 117 117	6.5	3.0	NA	1.8
## 118 118	7.7	3.8	6.7	2.2
## 119 119	7.7	2.6	6.9	NA
## 120 120	6.0	2.2	5.0	1.5
## 121 121	6.9	3.2	5.7	2.3
## 122 122	5.6	2.8	4.9	2.0
## 123 123	7.7	NA	6.7	2.0
## 124 124	6.3	2.7	4.9	1.8
## 125 125	6.7	3.3	5.7	2.1
## 126 126	NA	3.2	6.0	NA
## 127 127	6.2	2.8	4.8	1.8
## 128 128	6.1	3.0	4.9	1.8
## 129 129	6.4	2.8	5.6	2.1
## 130 130	7.2	3.0	5.8	1.6
## 131 131	7.4	NA	6.1	1.9
## 132 132	7.9	3.8	6.4	2.0
## 133 133	6.4	2.8	5.6	2.2
## 134 134	6.3	2.8	5.1	1.5
## 135 135	6.1	2.6	5.6	1.4
## 136 136	7.7	3.0	6.1	2.3
## 137 137	NA	3.4	5.6	2.4
## 138 138	6.4	3.1	5.5	1.8
## 139 139	6.0	3.0	4.8	1.8
## 140 140	6.9	3.1	NA	2.1
## 141 141	6.7	3.1	5.6	2.4
## 142 142	6.9	3.1	5.1	2.3
## 143 143	5.8	NA	5.1	1.9
## 144 144	NA	3.2	5.9	2.3
## 145 145	6.7	3.3	5.7	2.5
## 146 146	6.7	3.0	5.2	2.3
## 147 147	6.3	2.5	5.0	1.9
## 148 148	NA	3.0	5.2	2.0
## 149 149	6.2	NA	5.4	2.3
## 150 150	5.9	3.0	5.1	1.8

```
library(multiUS)
iris_knn = KNNimp(data=iris_mis1, k=10)
iris_knn
```

##	X	Sepal.Length	Sepal.Width	Petal.Length	Petal.Width
## 1	1	5.025663	3.500000	1.400000	0.2000000

## 2	2	4.900000	3.000000	1.400000	0.2000000
## 3	3	4.700000	3.318172	1.300000	0.2000000
## 4	4	4.600000	3.100000	1.500000	0.1965569
## 5	5	5.000000	3.600000	1.400000	0.2000000
## 6	6	5.400000	3.900000	1.700000	0.4000000
## 7	7	4.600000	3.400000	1.400000	0.3000000
## 8	8	5.000000	3.400000	1.500000	0.2000000
## 9	9	4.400000	3.153891	1.400000	0.2000000
## 10	10	4.900000	3.100000	1.509647	0.1000000
## 11	11	5.087472	3.700000	1.500000	0.2000000
## 12	12	4.800000	3.400000	1.503575	0.2000000
## 13	13	4.800000	3.000000	1.400000	0.1000000
## 14	14	4.788126	3.000000	1.100000	0.1000000
## 15	15	5.800000	4.000000	1.200000	0.2000000
## 16	16	5.700000	4.400000	1.500000	0.2850789
## 17	17	5.400000	3.900000	1.300000	0.4000000
## 18	18	5.100000	3.500000	1.400000	0.3000000
## 19	19	5.700000	3.800000	1.700000	0.2974964
## 20	20	5.100000	3.800000	1.500000	0.3000000
## 21	21	5.400000	3.400000	1.700000	0.2000000
## 22	22	5.100000	3.700000	1.500000	0.4000000
## 23	23	5.148035	3.600000	1.000000	0.2000000
## 24	24	5.100000	3.300000	1.700000	0.2523010
## 25	25	4.800000	3.400000	1.900000	0.2000000
## 26	26	5.000000	3.000000	1.600000	0.2000000
## 27	27	5.000000	3.400000	1.600000	0.4000000
## 28	28	5.200000	3.500000	1.500000	0.2000000
## 29	29	5.200000	3.400000	1.400000	0.2000000
## 30	30	4.700000	3.200000	1.600000	0.2000000
## 31	31	4.800000	3.100000	1.600000	0.2000000
## 32	32	5.400000	3.400000	1.500000	0.4000000
## 33	33	5.200000	3.520084	1.500000	0.1000000
## 34	34	5.500000	4.200000	1.400000	0.2000000
## 35	35	4.790390	3.100000	1.500000	0.2000000
## 36	36	5.000000	3.200000	1.200000	0.2000000
## 37	37	5.500000	3.500000	1.300000	0.2000000
## 38	38	4.900000	3.600000	1.400000	0.1000000
## 39	39	4.400000	3.000000	1.300000	0.2000000
## 40	40	5.100000	3.400000	1.500000	0.2874765
## 41	41	5.000000	3.500000	1.300000	0.3000000
## 42	42	4.500000	2.300000	1.300000	0.3000000
## 43	43	4.400000	3.200000	1.300000	0.2000000
## 44	44	5.000000	3.500000	1.600000	0.6000000
## 45	45	5.100000	3.800000	1.900000	0.4000000
## 46	46	4.800000	3.000000	1.400000	0.3000000
## 47	47	5.100000	3.800000	1.504947	0.2000000
## 48	48	4.600000	3.113484	1.400000	0.2000000
## 49	49	5.300000	3.700000	1.500000	0.2000000
## 50	50	5.000000	3.300000	1.400000	0.2000000
## 51	51	7.000000	3.200000	4.700000	1.5139891
## 52	52	6.100938	3.200000	4.500000	1.5000000
## 53	53	6.900000	2.907860	4.900000	1.4439768
## 54	54	5.500000	2.300000	3.779966	1.3000000
## 55	55	6.500000	2.800000	4.582692	1.5000000



## 56	56	5.700000	2.800000	4.500000	1.3000000
## 57	57	6.300000	3.300000	4.700000	1.6000000
## 58	58	4.900000	2.400000	3.300000	1.0000000
## 59	59	6.600000	2.900000	4.522296	1.3000000
## 60	60	5.200000	2.700000	3.900000	1.4000000
## 61	61	5.000000	2.000000	3.500000	1.0000000
## 62	62	6.001809	3.000000	4.200000	1.5000000
## 63	63	6.000000	2.200000	4.000000	1.1589358
## 64	64	6.100000	2.900000	4.700000	1.4000000
## 65	65	5.600000	2.900000	3.600000	1.3000000
## 66	66	6.700000	3.100000	4.400000	1.4000000
## 67	67	5.600000	3.000000	4.500000	1.5000000
## 68	68	5.800000	2.700000	4.100000	1.0000000
## 69	69	6.200000	2.200000	4.293208	1.5000000
## 70	70	5.600000	2.500000	3.967292	1.1000000
## 71	71	5.900000	3.200000	4.800000	1.8000000
## 72	72	6.100000	2.800000	4.000000	1.3000000
## 73	73	6.300000	2.500000	4.900000	1.5000000
## 74	74	6.100000	2.800000	4.700000	1.3339249
## 75	75	6.400000	2.900000	4.300000	1.3000000
## 76	76	6.129578	3.000000	4.400000	1.4000000
## 77	77	6.800000	2.800000	4.800000	1.4000000
## 78	78	6.150422	3.000000	5.000000	1.7000000
## 79	79	6.197689	2.925143	4.585341	1.5000000
## 80	80	5.700000	2.600000	3.500000	1.0000000
## 81	81	5.500000	2.400000	3.800000	1.1000000
## 82	82	5.500000	2.400000	3.700000	1.0000000
## 83	83	5.800000	2.700000	3.900000	1.2000000
## 84	84	6.000000	2.700000	5.100000	1.6000000
## 85	85	5.400000	3.000000	4.500000	1.5000000
## 86	86	6.000000	3.400000	4.500000	1.6000000
## 87	87	6.700000	3.100000	4.700000	1.5000000
## 88	88	6.300000	2.300000	4.400000	1.3000000
## 89	89	5.600000	3.000000	4.100000	1.3000000
## 90	90	5.500000	2.500000	4.000000	1.1313078
## 91	91	5.500000	2.600000	4.400000	1.2000000
## 92	92	6.100000	3.000000	4.600000	1.4000000
## 93	93	5.800000	2.600000	4.000000	1.2000000
## 94	94	5.000000	2.300000	3.300000	1.0000000
## 95	95	5.600000	2.700000	4.200000	1.3000000
## 96	96	5.700000	3.000000	4.204144	1.2000000
## 97	97	5.700000	2.900000	4.200000	1.3000000
## 98	98	6.200000	2.900000	4.300000	1.3000000
## 99	99	5.610210	2.500000	3.000000	1.1000000
## 100	100	5.700000	2.800000	4.100000	1.3000000
## 101	101	6.736502	3.300000	6.000000	1.9803417
## 102	102	5.800000	2.700000	5.100000	1.9000000
## 103	103	6.788565	3.000000	5.900000	2.1000000
## 104	104	6.300000	2.900000	5.600000	1.8000000
## 105	105	6.500000	3.000000	5.800000	2.2000000
## 106	106	7.600000	3.000000	6.600000	2.1000000
## 107	107	5.989036	2.500000	4.821780	1.7000000
## 108	108	7.300000	2.900000	6.300000	1.8000000
## 109	109	6.492510	2.867999	5.436849	1.8000000

## 110 110	7.065768	3.600000	6.100000	2.5000000
## 111 111	6.500000	3.200000	5.100000	2.0000000
## 112 112	6.400000	2.700000	5.300000	1.9000000
## 113 113	6.800000	3.000000	5.500000	2.1000000
## 114 114	6.120194	2.500000	5.000000	2.0000000
## 115 115	5.800000	2.800000	5.100000	2.4000000
## 116 116	6.795669	3.200000	5.300000	2.3000000
## 117 117	6.500000	3.000000	5.308921	1.8000000
## 118 118	7.700000	3.800000	6.700000	2.2000000
## 119 119	7.700000	2.600000	6.900000	2.0343210
## 120 120	6.000000	2.200000	5.000000	1.5000000
## 121 121	6.900000	3.200000	5.700000	2.3000000
## 122 122	5.600000	2.800000	4.900000	2.0000000
## 123 123	7.700000	3.276215	6.700000	2.0000000
## 124 124	6.300000	2.700000	4.900000	1.8000000
## 125 125	6.700000	3.300000	5.700000	2.1000000
## 126 126	6.848736	3.200000	6.000000	2.1410787
## 127 127	6.200000	2.800000	4.800000	1.8000000
## 128 128	6.100000	3.000000	4.900000	1.8000000
## 129 129	6.400000	2.800000	5.600000	2.1000000
## 130 130	7.200000	3.000000	5.800000	1.6000000
## 131 131	7.400000	3.209440	6.100000	1.9000000
## 132 132	7.900000	3.800000	6.400000	2.0000000
## 133 133	6.400000	2.800000	5.600000	2.2000000
## 134 134	6.300000	2.800000	5.100000	1.5000000
## 135 135	6.100000	2.600000	5.600000	1.4000000
## 136 136	7.700000	3.000000	6.100000	2.3000000
## 137 137	6.793561	3.400000	5.600000	2.4000000
## 138 138	6.400000	3.100000	5.500000	1.8000000
## 139 139	6.000000	3.000000	4.800000	1.8000000
## 140 140	6.900000	3.100000	5.471773	2.1000000
## 141 141	6.700000	3.100000	5.600000	2.4000000
## 142 142	6.900000	3.100000	5.100000	2.3000000
## 143 143	5.800000	2.797346	5.100000	1.9000000
## 144 144	6.775173	3.200000	5.900000	2.3000000
## 145 145	6.700000	3.300000	5.700000	2.5000000
## 146 146	6.700000	3.000000	5.200000	2.3000000
## 147 147	6.300000	2.500000	5.000000	1.9000000
## 148 148	6.483484	3.000000	5.200000	2.0000000
## 149 149	6.200000	2.948077	5.400000	2.3000000
## 150 150	5.900000	3.000000	5.100000	1.8000000

## Statistical Method

### Same data type

For data with all variable in a numeric data type, we can impute using Predictive Mean Matching (PMM)

```
airquality = read.table('./Data/airquality.txt')
airquality
```

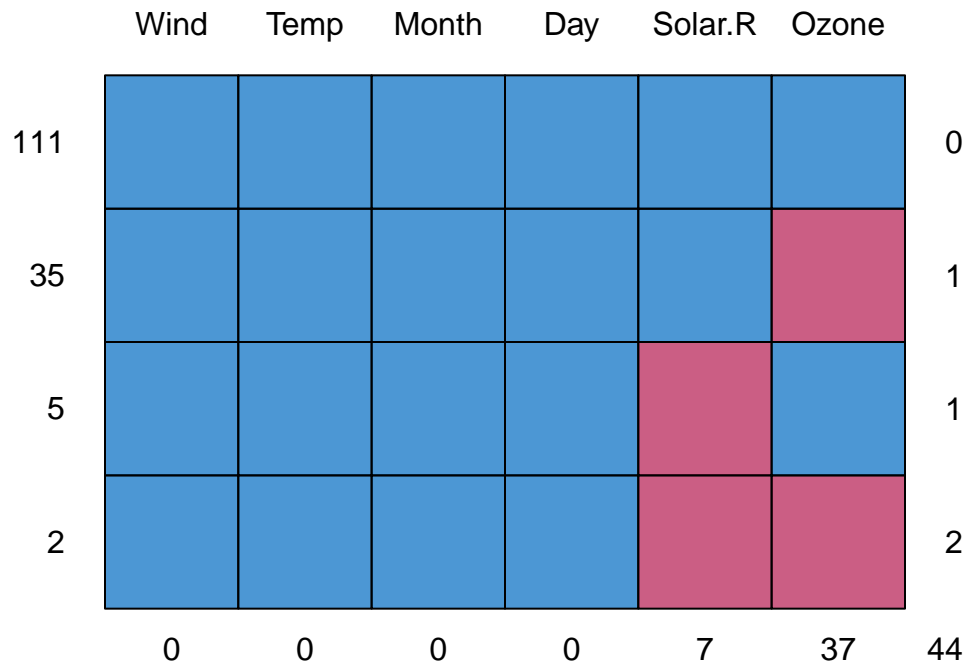
```
##      Ozone Solar.R Wind Temp Month Day
```

## 1	41	190	7.4	67	5	1
## 2	36	118	8.0	72	5	2
## 3	12	149	12.6	74	5	3
## 4	18	313	11.5	62	5	4
## 5	NA	NA	14.3	56	5	5
## 6	28	NA	14.9	66	5	6
## 7	23	299	8.6	65	5	7
## 8	19	99	13.8	59	5	8
## 9	8	19	20.1	61	5	9
## 10	NA	194	8.6	69	5	10
## 11	7	NA	6.9	74	5	11
## 12	16	256	9.7	69	5	12
## 13	11	290	9.2	66	5	13
## 14	14	274	10.9	68	5	14
## 15	18	65	13.2	58	5	15
## 16	14	334	11.5	64	5	16
## 17	34	307	12.0	66	5	17
## 18	6	78	18.4	57	5	18
## 19	30	322	11.5	68	5	19
## 20	11	44	9.7	62	5	20
## 21	1	8	9.7	59	5	21
## 22	11	320	16.6	73	5	22
## 23	4	25	9.7	61	5	23
## 24	32	92	12.0	61	5	24
## 25	NA	66	16.6	57	5	25
## 26	NA	266	14.9	58	5	26
## 27	NA	NA	8.0	57	5	27
## 28	23	13	12.0	67	5	28
## 29	45	252	14.9	81	5	29
## 30	115	223	5.7	79	5	30
## 31	37	279	7.4	76	5	31
## 32	NA	286	8.6	78	6	1
## 33	NA	287	9.7	74	6	2
## 34	NA	242	16.1	67	6	3
## 35	NA	186	9.2	84	6	4
## 36	NA	220	8.6	85	6	5
## 37	NA	264	14.3	79	6	6
## 38	29	127	9.7	82	6	7
## 39	NA	273	6.9	87	6	8
## 40	71	291	13.8	90	6	9
## 41	39	323	11.5	87	6	10
## 42	NA	259	10.9	93	6	11
## 43	NA	250	9.2	92	6	12
## 44	23	148	8.0	82	6	13
## 45	NA	332	13.8	80	6	14
## 46	NA	322	11.5	79	6	15
## 47	21	191	14.9	77	6	16
## 48	37	284	20.7	72	6	17
## 49	20	37	9.2	65	6	18
## 50	12	120	11.5	73	6	19
## 51	13	137	10.3	76	6	20
## 52	NA	150	6.3	77	6	21
## 53	NA	59	1.7	76	6	22
## 54	NA	91	4.6	76	6	23

## 55	NA	250	6.3	76	6	24
## 56	NA	135	8.0	75	6	25
## 57	NA	127	8.0	78	6	26
## 58	NA	47	10.3	73	6	27
## 59	NA	98	11.5	80	6	28
## 60	NA	31	14.9	77	6	29
## 61	NA	138	8.0	83	6	30
## 62	135	269	4.1	84	7	1
## 63	49	248	9.2	85	7	2
## 64	32	236	9.2	81	7	3
## 65	NA	101	10.9	84	7	4
## 66	64	175	4.6	83	7	5
## 67	40	314	10.9	83	7	6
## 68	77	276	5.1	88	7	7
## 69	97	267	6.3	92	7	8
## 70	97	272	5.7	92	7	9
## 71	85	175	7.4	89	7	10
## 72	NA	139	8.6	82	7	11
## 73	10	264	14.3	73	7	12
## 74	27	175	14.9	81	7	13
## 75	NA	291	14.9	91	7	14
## 76	7	48	14.3	80	7	15
## 77	48	260	6.9	81	7	16
## 78	35	274	10.3	82	7	17
## 79	61	285	6.3	84	7	18
## 80	79	187	5.1	87	7	19
## 81	63	220	11.5	85	7	20
## 82	16	7	6.9	74	7	21
## 83	NA	258	9.7	81	7	22
## 84	NA	295	11.5	82	7	23
## 85	80	294	8.6	86	7	24
## 86	108	223	8.0	85	7	25
## 87	20	81	8.6	82	7	26
## 88	52	82	12.0	86	7	27
## 89	82	213	7.4	88	7	28
## 90	50	275	7.4	86	7	29
## 91	64	253	7.4	83	7	30
## 92	59	254	9.2	81	7	31
## 93	39	83	6.9	81	8	1
## 94	9	24	13.8	81	8	2
## 95	16	77	7.4	82	8	3
## 96	78	NA	6.9	86	8	4
## 97	35	NA	7.4	85	8	5
## 98	66	NA	4.6	87	8	6
## 99	122	255	4.0	89	8	7
## 100	89	229	10.3	90	8	8
## 101	110	207	8.0	90	8	9
## 102	NA	222	8.6	92	8	10
## 103	NA	137	11.5	86	8	11
## 104	44	192	11.5	86	8	12
## 105	28	273	11.5	82	8	13
## 106	65	157	9.7	80	8	14
## 107	NA	64	11.5	79	8	15
## 108	22	71	10.3	77	8	16

## 109	59	51	6.3	79	8	17
## 110	23	115	7.4	76	8	18
## 111	31	244	10.9	78	8	19
## 112	44	190	10.3	78	8	20
## 113	21	259	15.5	77	8	21
## 114	9	36	14.3	72	8	22
## 115	NA	255	12.6	75	8	23
## 116	45	212	9.7	79	8	24
## 117	168	238	3.4	81	8	25
## 118	73	215	8.0	86	8	26
## 119	NA	153	5.7	88	8	27
## 120	76	203	9.7	97	8	28
## 121	118	225	2.3	94	8	29
## 122	84	237	6.3	96	8	30
## 123	85	188	6.3	94	8	31
## 124	96	167	6.9	91	9	1
## 125	78	197	5.1	92	9	2
## 126	73	183	2.8	93	9	3
## 127	91	189	4.6	93	9	4
## 128	47	95	7.4	87	9	5
## 129	32	92	15.5	84	9	6
## 130	20	252	10.9	80	9	7
## 131	23	220	10.3	78	9	8
## 132	21	230	10.9	75	9	9
## 133	24	259	9.7	73	9	10
## 134	44	236	14.9	81	9	11
## 135	21	259	15.5	76	9	12
## 136	28	238	6.3	77	9	13
## 137	9	24	10.9	71	9	14
## 138	13	112	11.5	71	9	15
## 139	46	237	6.9	78	9	16
## 140	18	224	13.8	67	9	17
## 141	13	27	10.3	76	9	18
## 142	24	238	10.3	68	9	19
## 143	16	201	8.0	82	9	20
## 144	13	238	12.6	64	9	21
## 145	23	14	9.2	71	9	22
## 146	36	139	10.3	81	9	23
## 147	7	49	10.3	69	9	24
## 148	14	20	16.6	63	9	25
## 149	30	193	6.9	70	9	26
## 150	NA	145	13.2	77	9	27
## 151	14	191	14.3	75	9	28
## 152	18	131	8.0	76	9	29
## 153	20	223	11.5	68	9	30

```
library(mice)
md.pattern(airquality)
```



```
##      Wind Temp Month Day Solar.R Ozone
## 111    1    1    1    1      1    1  0
## 35     1    1    1    1      1    0  1
## 5      1    1    1    1      0    1  1
## 2      1    1    1    1      0    0  2
##       0    0    0    0      7   37 44
```

```
impdata = mice(airquality, m=5, meth='pmm')
```

```
##
## iter imp variable
## 1 1 Ozone Solar.R
## 1 2 Ozone Solar.R
## 1 3 Ozone Solar.R
## 1 4 Ozone Solar.R
## 1 5 Ozone Solar.R
## 2 1 Ozone Solar.R
## 2 2 Ozone Solar.R
## 2 3 Ozone Solar.R
## 2 4 Ozone Solar.R
## 2 5 Ozone Solar.R
## 3 1 Ozone Solar.R
## 3 2 Ozone Solar.R
## 3 3 Ozone Solar.R
## 3 4 Ozone Solar.R
```

```
## 3 5 Ozone Solar.R
## 4 1 Ozone Solar.R
## 4 2 Ozone Solar.R
## 4 3 Ozone Solar.R
## 4 4 Ozone Solar.R
## 4 5 Ozone Solar.R
## 5 1 Ozone Solar.R
## 5 2 Ozone Solar.R
## 5 3 Ozone Solar.R
## 5 4 Ozone Solar.R
## 5 5 Ozone Solar.R
```

```
completedata = complete(impdata)
completedata
```

```
##      Ozone Solar.R Wind Temp Month Day
## 1      41      190  7.4   67     5   1
## 2      36      118  8.0   72     5   2
## 3      12      149 12.6   74     5   3
## 4      18      313 11.5   62     5   4
## 5       1      274 14.3   56     5   5
## 6      28      190 14.9   66     5   6
## 7      23      299  8.6   65     5   7
## 8      19       99 13.8   59     5   8
## 9       8       19 20.1   61     5   9
## 10     20      194  8.6   69     5  10
## 11      7      148  6.9   74     5  11
## 12     16      256  9.7   69     5  12
## 13     11      290  9.2   66     5  13
## 14     14      274 10.9   68     5  14
## 15     18       65 13.2   58     5  15
## 16     14      334 11.5   64     5  16
## 17     34      307 12.0   66     5  17
## 18      6       78 18.4   57     5  18
## 19     30      322 11.5   68     5  19
## 20     11       44  9.7   62     5  20
## 21      1        8  9.7   59     5  21
## 22     11      320 16.6   73     5  22
## 23      4       25  9.7   61     5  23
## 24     32       92 12.0   61     5  24
## 25     13       66 16.6   57     5  25
## 26     32      266 14.9   58     5  26
## 27     34       47  8.0   57     5  27
## 28     23       13 12.0   67     5  28
## 29     45      252 14.9   81     5  29
## 30    115      223  5.7   79     5  30
## 31     37      279  7.4   76     5  31
## 32     29      286  8.6   78     6   1
## 33     16      287  9.7   74     6   2
## 34     37      242 16.1   67     6   3
## 35     35      186  9.2   84     6   4
## 36     39      220  8.6   85     6   5
## 37     16      264 14.3   79     6   6
## 38     29      127  9.7   82     6   7
```

## 39	50	273	6.9	87	6	8
## 40	71	291	13.8	90	6	9
## 41	39	323	11.5	87	6	10
## 42	82	259	10.9	93	6	11
## 43	91	250	9.2	92	6	12
## 44	23	148	8.0	82	6	13
## 45	28	332	13.8	80	6	14
## 46	52	322	11.5	79	6	15
## 47	21	191	14.9	77	6	16
## 48	37	284	20.7	72	6	17
## 49	20	37	9.2	65	6	18
## 50	12	120	11.5	73	6	19
## 51	13	137	10.3	76	6	20
## 52	37	150	6.3	77	6	21
## 53	61	59	1.7	76	6	22
## 54	108	91	4.6	76	6	23
## 55	89	250	6.3	76	6	24
## 56	35	135	8.0	75	6	25
## 57	48	127	8.0	78	6	26
## 58	23	47	10.3	73	6	27
## 59	40	98	11.5	80	6	28
## 60	16	31	14.9	77	6	29
## 61	61	138	8.0	83	6	30
## 62	135	269	4.1	84	7	1
## 63	49	248	9.2	85	7	2
## 64	32	236	9.2	81	7	3
## 65	16	101	10.9	84	7	4
## 66	64	175	4.6	83	7	5
## 67	40	314	10.9	83	7	6
## 68	77	276	5.1	88	7	7
## 69	97	267	6.3	92	7	8
## 70	97	272	5.7	92	7	9
## 71	85	175	7.4	89	7	10
## 72	40	139	8.6	82	7	11
## 73	10	264	14.3	73	7	12
## 74	27	175	14.9	81	7	13
## 75	23	291	14.9	91	7	14
## 76	7	48	14.3	80	7	15
## 77	48	260	6.9	81	7	16
## 78	35	274	10.3	82	7	17
## 79	61	285	6.3	84	7	18
## 80	79	187	5.1	87	7	19
## 81	63	220	11.5	85	7	20
## 82	16	7	6.9	74	7	21
## 83	78	258	9.7	81	7	22
## 84	63	295	11.5	82	7	23
## 85	80	294	8.6	86	7	24
## 86	108	223	8.0	85	7	25
## 87	20	81	8.6	82	7	26
## 88	52	82	12.0	86	7	27
## 89	82	213	7.4	88	7	28
## 90	50	275	7.4	86	7	29
## 91	64	253	7.4	83	7	30
## 92	59	254	9.2	81	7	31

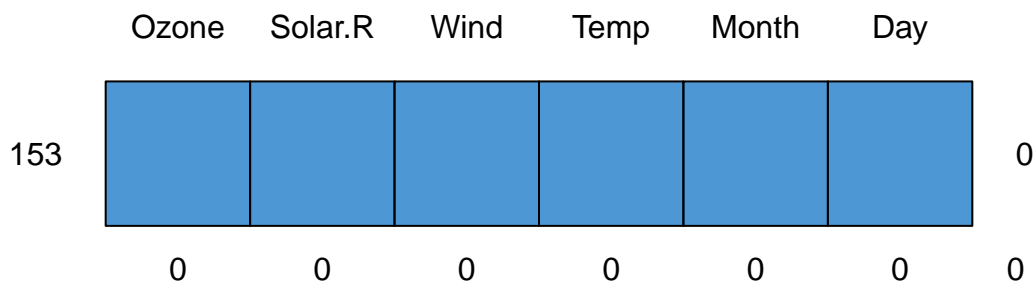


## 93	39	83	6.9	81	8	1
## 94	9	24	13.8	81	8	2
## 95	16	77	7.4	82	8	3
## 96	78	19	6.9	86	8	4
## 97	35	98	7.4	85	8	5
## 98	66	286	4.6	87	8	6
## 99	122	255	4.0	89	8	7
## 100	89	229	10.3	90	8	8
## 101	110	207	8.0	90	8	9
## 102	115	222	8.6	92	8	10
## 103	29	137	11.5	86	8	11
## 104	44	192	11.5	86	8	12
## 105	28	273	11.5	82	8	13
## 106	65	157	9.7	80	8	14
## 107	16	64	11.5	79	8	15
## 108	22	71	10.3	77	8	16
## 109	59	51	6.3	79	8	17
## 110	23	115	7.4	76	8	18
## 111	31	244	10.9	78	8	19
## 112	44	190	10.3	78	8	20
## 113	21	259	15.5	77	8	21
## 114	9	36	14.3	72	8	22
## 115	16	255	12.6	75	8	23
## 116	45	212	9.7	79	8	24
## 117	168	238	3.4	81	8	25
## 118	73	215	8.0	86	8	26
## 119	77	153	5.7	88	8	27
## 120	76	203	9.7	97	8	28
## 121	118	225	2.3	94	8	29
## 122	84	237	6.3	96	8	30
## 123	85	188	6.3	94	8	31
## 124	96	167	6.9	91	9	1
## 125	78	197	5.1	92	9	2
## 126	73	183	2.8	93	9	3
## 127	91	189	4.6	93	9	4
## 128	47	95	7.4	87	9	5
## 129	32	92	15.5	84	9	6
## 130	20	252	10.9	80	9	7
## 131	23	220	10.3	78	9	8
## 132	21	230	10.9	75	9	9
## 133	24	259	9.7	73	9	10
## 134	44	236	14.9	81	9	11
## 135	21	259	15.5	76	9	12
## 136	28	238	6.3	77	9	13
## 137	9	24	10.9	71	9	14
## 138	13	112	11.5	71	9	15
## 139	46	237	6.9	78	9	16
## 140	18	224	13.8	67	9	17
## 141	13	27	10.3	76	9	18
## 142	24	238	10.3	68	9	19
## 143	16	201	8.0	82	9	20
## 144	13	238	12.6	64	9	21
## 145	23	14	9.2	71	9	22
## 146	36	139	10.3	81	9	23

```
## 147      7      49 10.3  69      9  24
## 148     14      20 16.6  63      9  25
## 149     30     193  6.9  70      9  26
## 150     22     145 13.2  77      9  27
## 151     14     191 14.3  75      9  28
## 152     18     131  8.0  76      9  29
## 153     20     223 11.5  68      9  30
```

```
md.pattern(completedata)
```

```
##  /\      /\
## {  '---'  }
## {  0    0  }
## ==> V <== No need for mice. This data set is completely observed.
##  \  \|/  /
##   '-----'
```



```
##      Ozone Solar.R Wind Temp Month Day
## 153      1      1    1    1    1    1 0
##      0      0    0    0    0    0 0
```

## Different data type

For data with different data type, we can use **use different method depends on the variable type**

```
dat2 = read.csv('./Data/dat2.csv')
dat2
```

##	X	Age	Gender	Cholesterol	SystolicBP	BMI	Smoking	Education
## 1	1	67.9	Female	236.4	129.8	26.4	Yes	High
## 2	2	54.8	Female	256.3	133.4	28.4	No	Medium
## 3	3	68.4	Male	198.7	158.5	24.1	Yes	High
## 4	4	67.9	Male	205.0	136.0	19.9	No	Low
## 5	5	60.9	Male	207.7	145.4	26.7	No	Medium
## 6	6	44.9	Female	222.5	130.6	30.6	No	Low
## 7	7	49.9	Male	201.9	152.2	27.3	<NA>	Medium
## 8	8	55.1	Female	206.2	151.3	27.5	No	Low
## 9	9	57.5	Male	202.5	142.4	28.3	No	High
## 10	10	77.2	Male	239.9	161.1	29.1	No	High
## 11	11	63.8	Female	238.6	140.0	26.3	Yes	<NA>
## 12	12	50.9	Male	247.3	142.2	26.1	Yes	High
## 13	13	48.1	Female	NA	156.4	24.3	No	<NA>
## 14	14	55.1	Female	221.3	149.9	21.6	No	Low
## 15	15	55.0	Male	NA	153.9	21.3	No	Low
## 16	16	54.1	Male	303.0	160.2	24.1	No	Medium
## 17	17	59.6	Female	238.9	147.7	24.3	No	High
## 18	18	50.2	Male	224.0	151.8	25.8	No	Medium
## 19	19	61.1	Female	202.6	138.7	22.3	Yes	Low
## 20	20	47.4	Female	212.6	149.9	23.7	No	High
## 21	21	55.7	Male	185.6	142.0	33.7	Yes	Low
## 22	22	60.6	Male	188.3	158.2	29.0	Yes	High
## 23	23	58.6	Male	216.0	144.7	28.5	No	Medium
## 24	24	64.1	Female	NA	145.5	27.3	No	High
## 25	25	57.0	Female	226.6	145.2	23.5	No	High
## 26	26	61.6	Female	216.4	124.4	NA	No	High
## 27	27	66.4	Male	182.5	135.1	25.8	Yes	Medium
## 28	28	51.8	Male	241.2	165.2	27.8	Yes	High
## 29	29	47.0	Male	236.5	152.4	27.3	<NA>	Low
## 30	30	57.9	Male	263.9	145.6	35.0	No	High
## 31	31	55.6	Male	181.6	143.6	26.0	Yes	Low
## 32	32	53.0	Male	218.8	143.5	24.3	Yes	<NA>
## 33	33	53.9	Female	267.1	149.7	20.5	<NA>	Medium
## 34	34	52.2	Female	228.4	153.2	23.2	No	Low
## 35	35	63.5	Female	258.4	135.2	38.3	No	High
## 36	36	66.9	Female	239.2	143.8	28.7	No	High
## 37	37	65.6	Female	228.8	132.4	31.2	Yes	Low
## 38	38	54.0	Female	247.3	140.8	28.3	Yes	High
## 39	39	67.7	Female	182.9	150.4	28.1	No	Low
## 40	40	55.2	Female	217.5	130.4	26.7	Yes	Low
## 41	41	71.9	Male	240.0	155.6	29.7	No	High
## 42	42	62.1	Female	257.4	157.2	33.5	No	<NA>
## 43	43	53.8	Male	243.8	145.1	31.2	No	High
## 44	44	50.7	Male	230.2	147.9	26.5	No	Low
## 45	45	47.9	Female	252.6	158.9	27.8	No	Medium
## 46	46	48.8	Female	225.9	139.2	21.3	No	Low
## 47	47	44.7	Female	199.4	135.6	32.2	No	Medium
## 48	48	67.0	Male	225.0	133.4	NA	Yes	High
## 49	49	64.3	Female	221.7	135.3	21.1	No	Medium

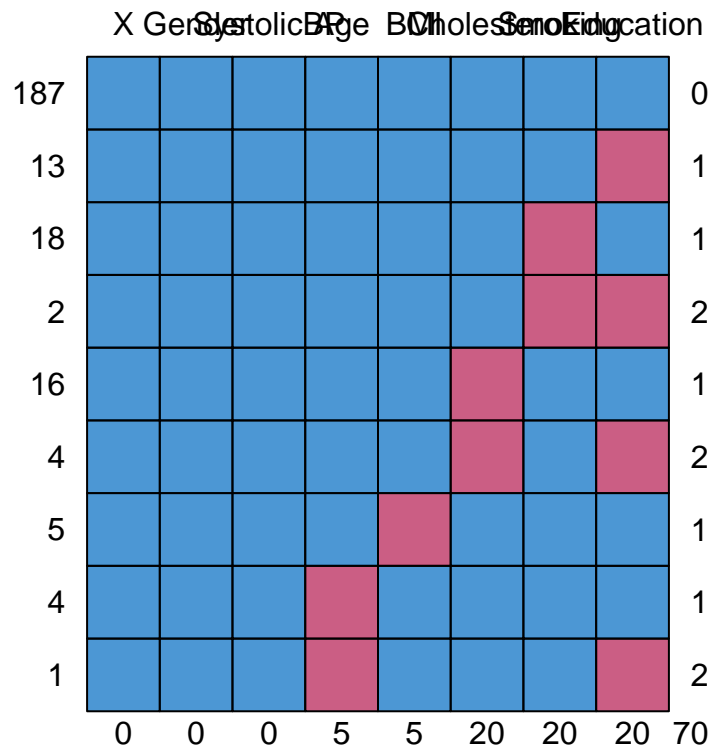
## 50	50	55.6	Female	234.4	137.9	27.3	<NA>	Low
## 51	51	59.7	Male	216.6	149.0	23.7	Yes	<NA>
## 52	52	54.4	Male	241.1	135.6	22.4	No	Low
## 53	53	77.5	Female	274.5	142.4	31.9	Yes	High
## 54	54	51.0	Female	183.0	146.8	32.3	No	Medium
## 55	55	57.1	Male	239.4	132.1	35.9	No	Low
## 56	56	59.6	Male	208.5	159.7	29.5	Yes	Low
## 57	57	62.6	Female	210.7	158.5	19.7	No	Low
## 58	58	56.1	Female	182.6	126.8	29.5	No	Medium
## 59	59	39.3	Female	219.5	140.3	24.5	Yes	Medium
## 60	60	47.1	Male	233.5	141.4	26.6	No	Medium
## 61	61	60.4	Male	191.8	146.9	28.4	Yes	High
## 62	62	57.4	Male	271.5	133.2	27.7	No	High
## 63	63	49.8	Female	207.6	141.4	30.7	No	Medium
## 64	64	56.6	Female	171.6	153.2	24.6	No	Low
## 65	65	50.8	Male	222.9	155.3	24.6	No	High
## 66	66	59.5	Male	281.3	147.5	28.2	No	Low
## 67	67	45.8	Male	263.4	148.6	31.1	No	Low
## 68	68	60.5	Female	255.9	138.6	25.8	No	<NA>
## 69	69	59.5	Male	244.3	140.7	24.6	No	High
## 70	70	58.0	Female	236.5	157.0	23.2	No	Medium
## 71	71	57.7	Male	215.2	145.9	24.2	No	Medium
## 72	72	59.6	Female	NA	138.2	26.2	No	Medium
## 73	73	52.2	Female	172.9	161.9	22.5	Yes	Medium
## 74	74	56.5	Female	NA	139.2	30.3	Yes	Medium
## 75	75	62.9	Female	183.3	156.7	18.8	No	High
## 76	76	66.5	Male	202.2	151.1	26.8	No	Low
## 77	77	58.7	Female	242.9	149.1	21.3	No	Low
## 78	78	56.5	Male	204.6	142.0	32.5	No	<NA>
## 79	79	50.0	Female	189.1	154.2	25.3	No	<NA>
## 80	80	45.7	Male	202.6	128.5	32.1	No	Medium
## 81	81	51.0	Male	184.9	135.1	25.6	Yes	High
## 82	82	67.8	Female	244.6	142.7	26.5	<NA>	Low
## 83	83	63.8	Male	190.0	146.8	23.1	No	Medium
## 84	84	55.7	Male	222.2	146.2	14.5	Yes	Medium
## 85	85	54.0	Female	239.3	142.3	34.3	No	Medium
## 86	86	54.1	Female	254.1	142.2	21.5	<NA>	Medium
## 87	87	65.7	Female	270.5	150.0	38.2	Yes	Medium
## 88	88	55.2	Female	NA	138.4	28.8	No	<NA>
## 89	89	67.8	Female	247.5	122.9	NA	No	Medium
## 90	90	62.8	Male	212.4	145.2	30.3	No	Low
## 91	91	68.2	Male	221.3	154.0	31.1	No	<NA>
## 92	92	50.3	Female	259.9	155.2	26.4	<NA>	<NA>
## 93	93	57.6	Female	211.2	142.2	28.0	No	<NA>
## 94	94	50.3	Male	241.7	144.6	35.1	No	High
## 95	95	62.4	Male	NA	160.6	21.5	Yes	High
## 96	96	58.5	Male	214.0	138.6	27.2	No	Medium
## 97	97	55.2	Male	259.0	143.9	30.7	Yes	Low
## 98	98	69.4	Female	220.3	150.1	21.5	Yes	High
## 99	99	59.4	Female	220.6	138.6	19.9	No	High
## 100	100	65.7	Female	242.1	140.5	33.1	Yes	Low
## 101	101	63.9	Female	247.3	151.0	24.3	<NA>	Medium
## 102	102	51.1	Male	203.7	137.8	23.0	Yes	Medium
## 103	103	52.4	Male	252.8	149.9	27.2	Yes	High

## 104	104	57.9	Female	210.5	133.0	25.1	No	Low
## 105	105	NA	Male	204.6	124.6	25.1	Yes	Medium
## 106	106	62.2	Male	170.3	151.5	21.4	Yes	High
## 107	107	47.0	Male	222.2	143.8	23.6	No	Medium
## 108	108	70.8	Female	233.1	140.8	31.0	No	High
## 109	109	53.4	Female	208.8	139.9	29.5	<NA>	Medium
## 110	110	71.3	Male	255.0	155.3	24.7	<NA>	Low
## 111	111	54.1	Female	240.3	134.1	37.5	No	High
## 112	112	49.5	Male	NA	155.0	33.6	Yes	Medium
## 113	113	57.7	Female	268.4	134.6	24.3	No	Low
## 114	114	57.7	Female	190.0	143.8	27.0	No	<NA>
## 115	115	43.7	Female	232.4	143.0	13.8	No	Medium
## 116	116	66.1	Male	245.6	151.1	31.4	No	High
## 117	117	48.3	Female	202.0	127.1	NA	No	High
## 118	118	60.3	Female	219.5	142.6	25.3	No	High
## 119	119	61.6	Female	224.3	143.8	26.6	No	High
## 120	120	58.6	Male	215.1	150.9	27.8	Yes	Low
## 121	121	56.5	Female	227.3	156.6	31.7	<NA>	Medium
## 122	122	59.1	Male	221.9	135.2	23.3	<NA>	High
## 123	123	48.7	Female	205.9	148.5	31.9	No	High
## 124	124	50.9	Male	243.6	149.8	30.6	No	Low
## 125	125	48.4	Female	211.9	157.3	24.4	No	High
## 126	126	70.5	Female	210.8	144.3	26.2	No	Medium
## 127	127	69.8	Male	237.0	156.9	35.1	No	High
## 128	128	59.7	Female	265.8	146.1	26.7	Yes	Medium
## 129	129	47.4	Male	183.9	142.2	21.6	Yes	Medium
## 130	130	57.5	Female	230.3	150.4	21.2	No	Medium
## 131	131	69.9	Male	235.0	148.1	27.1	No	Medium
## 132	132	53.6	Male	226.3	149.1	28.4	No	High
## 133	133	64.0	Female	286.3	155.4	28.5	No	Low
## 134	134	49.5	Female	255.4	142.3	26.3	No	Medium
## 135	135	63.2	Male	212.9	142.8	19.1	<NA>	High
## 136	136	49.7	Female	210.8	143.1	25.5	<NA>	Low
## 137	137	47.4	Female	NA	156.1	31.3	Yes	High
## 138	138	49.7	Female	249.5	165.1	17.7	Yes	High
## 139	139	50.4	Female	242.6	155.0	30.0	No	High
## 140	140	50.0	Male	211.3	155.8	21.2	No	Low
## 141	141	63.6	Male	238.4	163.2	26.5	No	Low
## 142	142	58.1	Male	223.8	139.4	21.5	No	High
## 143	143	54.8	Female	NA	130.2	30.8	No	High
## 144	144	NA	Male	205.3	133.9	24.9	No	Low
## 145	145	49.2	Female	226.4	147.8	29.2	No	Medium
## 146	146	51.2	Male	201.3	145.4	24.0	No	Medium
## 147	147	48.3	Female	202.3	117.5	22.4	No	Low
## 148	148	53.8	Female	225.7	157.3	21.1	No	High
## 149	149	61.4	Male	220.1	143.0	22.5	No	High
## 150	150	47.8	Male	213.8	144.6	25.9	No	Medium
## 151	151	69.6	Male	262.3	149.3	33.2	No	High
## 152	152	46.7	Male	227.7	131.8	29.8	No	High
## 153	153	56.7	Male	256.9	138.0	24.7	No	High
## 154	154	76.9	Female	202.3	155.7	28.4	<NA>	<NA>
## 155	155	64.8	Female	219.8	165.3	23.2	<NA>	High
## 156	156	55.4	Female	192.3	152.2	24.8	No	High
## 157	157	50.4	Female	259.7	152.7	28.1	No	Medium

## 158	158	62.3	Female	202.3	127.8	38.7	No	<NA>
## 159	159	57.4	Female	260.5	155.9	28.4	Yes	High
## 160	160	54.4	Male	202.1	156.7	27.8	Yes	High
## 161	161	NA	Male	223.4	141.6	17.7	No	<NA>
## 162	162	53.5	Female	NA	147.1	32.3	Yes	High
## 163	163	79.3	Male	219.7	154.6	32.6	Yes	High
## 164	164	71.3	Female	225.9	167.2	20.6	No	High
## 165	165	63.9	Male	180.1	133.9	27.4	No	High
## 166	166	63.3	Female	218.8	155.7	23.9	No	Medium
## 167	167	53.0	Female	NA	159.2	27.9	No	Low
## 168	168	64.8	Male	182.0	154.5	25.3	Yes	High
## 169	169	54.6	Female	246.9	148.2	31.7	No	Low
## 170	170	49.2	Female	NA	143.7	28.3	Yes	<NA>
## 171	171	72.9	Male	220.4	146.9	27.8	No	Low
## 172	172	49.9	Male	239.0	154.1	29.0	No	Medium
## 173	173	55.1	Female	213.1	134.2	19.8	No	Low
## 174	174	52.5	Male	243.2	132.7	22.5	Yes	High
## 175	175	49.7	Female	228.7	137.9	33.1	No	Medium
## 176	176	62.4	Female	260.9	130.7	28.2	No	Low
## 177	177	45.0	Female	209.9	128.2	29.1	No	High
## 178	178	55.8	Female	198.1	159.3	21.5	No	<NA>
## 179	179	52.8	Female	234.1	135.8	36.5	No	Medium
## 180	180	46.1	Female	221.0	140.1	25.1	Yes	Medium
## 181	181	56.9	Female	218.6	133.6	29.4	No	Medium
## 182	182	54.0	Male	NA	150.4	26.3	Yes	<NA>
## 183	183	52.6	Male	NA	150.6	31.3	No	High
## 184	184	65.5	Female	226.0	157.3	23.6	Yes	High
## 185	185	61.9	Female	240.6	140.5	31.5	No	High
## 186	186	56.8	Female	243.5	157.9	31.6	No	High
## 187	187	58.8	Female	245.4	146.6	24.1	Yes	<NA>
## 188	188	51.5	Female	248.5	131.9	20.4	Yes	Low
## 189	189	55.8	Female	256.3	156.9	29.1	No	High
## 190	190	66.5	Female	222.4	160.6	17.5	Yes	Low
## 191	191	57.4	Male	215.2	153.4	30.5	Yes	High
## 192	192	58.8	Female	196.5	140.8	30.6	No	Low
## 193	193	74.1	Female	220.0	131.5	30.7	No	Medium
## 194	194	51.7	Male	203.6	145.6	26.0	Yes	High
## 195	195	65.4	Female	235.3	131.5	35.1	No	High
## 196	196	72.2	Female	220.9	126.7	26.8	No	High
## 197	197	48.8	Female	212.4	152.4	23.3	Yes	Low
## 198	198	57.6	Male	202.4	142.1	25.8	No	Medium
## 199	199	54.3	Female	NA	141.1	22.1	Yes	High
## 200	200	NA	Male	211.4	138.6	22.0	No	High
## 201	201	48.9	Female	195.8	158.6	28.3	No	Low
## 202	202	50.2	Male	192.2	129.0	27.6	No	High
## 203	203	67.9	Male	251.7	140.7	25.1	Yes	Medium
## 204	204	62.4	Male	NA	151.0	26.5	No	Low
## 205	205	63.9	Male	207.5	148.2	26.7	Yes	Medium
## 206	206	70.3	Male	218.7	138.9	26.1	No	Medium
## 207	207	54.5	Female	212.0	144.6	34.8	No	Medium
## 208	208	64.2	Female	215.1	143.2	24.9	Yes	Low
## 209	209	57.0	Female	218.2	162.4	NA	Yes	Low
## 210	210	53.4	Male	211.3	146.2	26.0	No	High
## 211	211	65.1	Male	NA	138.5	22.9	No	High

##	212	212	57.8	Male	242.5	157.3	23.5	No	High
##	213	213	48.8	Female	223.0	132.2	28.1	<NA>	High
##	214	214	55.5	Female	191.4	150.7	25.0	Yes	High
##	215	215	69.8	Male	244.7	157.8	28.1	No	Medium
##	216	216	67.1	Female	184.4	133.3	28.8	No	High
##	217	217	NA	Female	216.1	148.5	30.5	No	Medium
##	218	218	58.3	Female	218.8	154.9	23.1	No	Medium
##	219	219	64.5	Female	203.4	156.6	33.1	Yes	Low
##	220	220	44.2	Female	232.4	160.7	19.4	No	High
##	221	221	69.1	Male	189.9	164.8	19.3	No	Medium
##	222	222	53.1	Female	261.6	147.2	32.2	Yes	High
##	223	223	59.8	Male	234.3	136.6	32.6	No	Low
##	224	224	55.9	Male	265.9	137.5	22.5	No	High
##	225	225	70.4	Male	240.9	152.3	29.5	No	Medium
##	226	226	45.4	Female	185.6	129.2	21.8	No	High
##	227	227	56.3	Male	240.9	150.3	34.1	No	Low
##	228	228	48.7	Female	236.2	133.4	27.7	No	High
##	229	229	60.8	Female	249.9	135.8	26.8	No	Low
##	230	230	75.8	Female	251.1	148.7	26.0	<NA>	Low
##	231	231	45.1	Female	236.5	139.2	22.2	<NA>	Low
##	232	232	57.0	Male	240.6	136.7	30.9	No	High
##	233	233	56.3	Female	211.8	138.4	27.4	No	Medium
##	234	234	70.1	Male	263.1	159.6	29.5	Yes	High
##	235	235	49.4	Female	NA	131.2	24.0	No	High
##	236	236	61.6	Male	181.0	146.3	25.6	No	High
##	237	237	71.4	Female	195.0	140.4	28.4	No	High
##	238	238	55.4	Female	247.2	175.4	20.0	No	Medium
##	239	239	51.7	Male	199.3	143.6	23.4	No	Low
##	240	240	56.2	Female	216.5	163.8	24.8	No	High
##	241	241	61.6	Female	227.6	154.0	29.8	No	High
##	242	242	49.2	Female	214.1	129.2	23.4	<NA>	Medium
##	243	243	70.7	Female	176.2	150.5	22.8	No	Low
##	244	244	57.5	Male	253.3	152.3	29.1	No	High
##	245	245	33.7	Female	223.8	145.5	24.2	No	High
##	246	246	48.4	Female	238.2	125.3	31.6	No	Low
##	247	247	70.2	Female	225.7	168.1	20.3	Yes	High
##	248	248	49.5	Female	NA	143.3	25.8	No	Low
##	249	249	56.7	Male	228.0	130.9	24.0	Yes	High
##	250	250	57.8	Female	244.9	157.9	25.2	No	Low

```
md.pattern(dat2)
```



```
##      X Gender SystolicBP Age BMI Cholesterol Smoking Education
## 187 1      1           1  1  1           1      1           1  0
## 13 1      1           1  1  1           1      1           0  1
## 18 1      1           1  1  1           1      0           1  1
## 2  1      1           1  1  1           1      0           0  2
## 16 1      1           1  1  1           0      1           1  1
## 4  1      1           1  1  1           0      1           0  2
## 5  1      1           1  1  0           1      1           1  1
## 4  1      1           1  0  1           1      1           1  1
## 1  1      1           1  0  1           1      1           0  2
##    0      0           0  5  5           20     20           20 70
```

```
str(dat2)
```

```
## 'data.frame': 250 obs. of 8 variables:
## $ X : int 1 2 3 4 5 6 7 8 9 10 ...
## $ Age : num 67.9 54.8 68.4 67.9 60.9 44.9 49.9 55.1 57.5 77.2 ...
## $ Gender : chr "Female" "Female" "Male" "Male" ...
## $ Cholesterol: num 236 256 199 205 208 ...
## $ SystolicBP : num 130 133 158 136 145 ...
## $ BMI : num 26.4 28.4 24.1 19.9 26.7 30.6 27.3 27.5 28.3 29.1 ...
## $ Smoking : chr "Yes" "No" "Yes" "No" ...
## $ Education : chr "High" "Medium" "High" "Low" ...
```



```
library(dplyr)
```

```
##
```

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

```
## The following objects are masked from 'package:stats':
```

```
##
```

```
## filter, lag
```

```
## The following objects are masked from 'package:base':
```

```
##
```

```
## intersect, setdiff, setequal, union
```

```
dat2 = dat2 %>%
```

```
  mutate(Gender=as.factor(Gender)) %>%
```

```
  mutate(Smoking=as.factor(Smoking)) %>%
```

```
  mutate(Education=as.factor(Education))
```

```
str(dat2)
```

```
## 'data.frame': 250 obs. of 8 variables:
```

```
## $ X : int 1 2 3 4 5 6 7 8 9 10 ...
```

```
## $ Age : num 67.9 54.8 68.4 67.9 60.9 44.9 49.9 55.1 57.5 77.2 ...
```

```
## $ Gender : Factor w/ 2 levels "Female","Male": 1 1 2 2 2 1 2 1 2 2 ...
```

```
## $ Cholesterol: num 236 256 199 205 208 ...
```

```
## $ SystolicBP : num 130 133 158 136 145 ...
```

```
## $ BMI : num 26.4 28.4 24.1 19.9 26.7 30.6 27.3 27.5 28.3 29.1 ...
```

```
## $ Smoking : Factor w/ 2 levels "No","Yes": 2 1 2 1 1 1 NA 1 1 1 ...
```

```
## $ Education : Factor w/ 3 levels "High","Low","Medium": 1 3 1 2 3 2 3 2 1 1 ...
```