Assignment 1: Data Wrangling With Base R

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Part 1 - R Basics

1. Calculate the following sums.

```
x<-c(1:2019)
s1<-sum(x)
s1
```

```
## [1] 2039190
```

```
s2<-sum(x^3)
s2
```

```
## [1] 4.158296e+12
```

```
s3<-sum(x^x)
s3
```

```
## [1] Inf
```

```
y<-x*c(1,-1)
```

```
## Warning in x * c(1, -1): longer object length is not a multiple of shorter
## object length
```

```
s4<-sum(y^x)
s4
```

```
## [1] Inf
```

```
s5<-sum((1/(x^2)))
s5
```

```
## [1] 1.644439
```

```
s6<-sum((1/x))
s6
```

```
## [1] 8.187821
```

```r
s7<-sum((1/(x^3)))
s7
```

```
## [1] 1.202057
```

```r
s8<-sum((1/y))
s8
```

```
## [1] 0.6933948
```

2. Rnorm 1000 samples of mean 10 and sd 1

```r
x<-rnorm(1000,mean=10,sd=1)
```

a. mean and standard deviation

```r
mean(x)
```

```
## [1] 10.03756
```

```r
sd(x)
```

```
## [1] 1.005269
```

b. How many do you think are greater than 10? Check estimation.

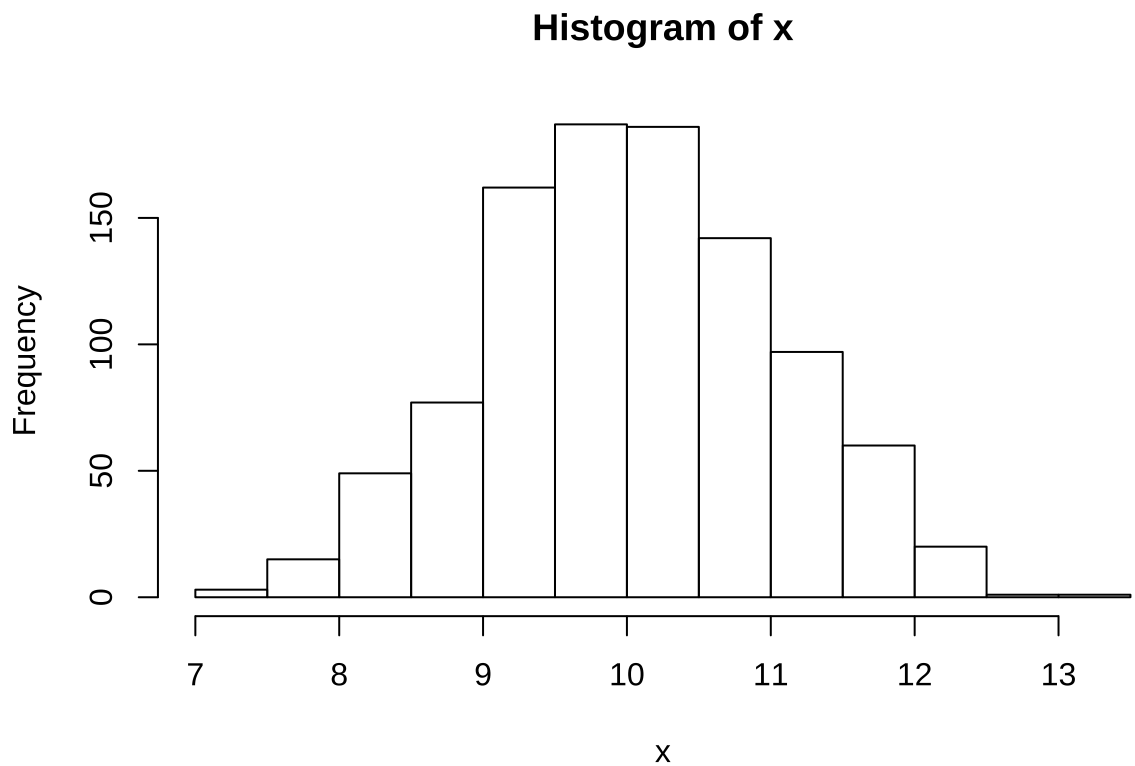
I believe there are 500 samples that are greater than 10.

```r
y<-x>10
sum(y)
```

```
## [1] 507
```

c. Histogram of sample

```r
hist(x)
```



.d Estimate P(x>1) for N(2,1)

```
z<-rnorm(1000, mean=2, sd=1)
w<-z>1
sum(w)/1000
```

```
## [1] 0.842
```

3. Tossing a fair dice

a. Generate sample of 1000 values with replacment

```
x<-sample(c(1:6),1000,replace=TRUE)
x
```

```
##    [1] 2 1 3 3 6 2 1 2 2 2 3 1 4 5 2 6 2 4 3 4 1 5 4 2 4 4 2 5 3 2 3 6 4 2
##   [35] 5 5 2 3 3 3 5 5 2 3 6 1 5 4 6 2 5 4 5 4 5 6 6 1 1 5 4 5 3 2 5 3 2 6
##   [69] 2 5 3 1 4 1 4 6 6 6 1 3 3 3 1 3 4 6 1 4 6 6 5 5 3 5 5 2 4 3 5 1 6 4
##  [103] 3 4 3 5 4 5 2 6 5 3 2 6 5 4 1 5 5 5 6 2 1 1 1 2 6 4 4 5 3 6 4 5 2 5
##  [137] 4 6 2 5 3 4 2 3 4 1 4 3 5 5 3 6 1 3 4 3 4 1 3 1 4 2 1 4 6 2 1 6 2 5
##  [171] 4 5 1 5 6 6 4 3 6 6 1 2 5 1 5 5 4 6 6 6 4 2 5 1 3 1 2 5 1 6 1 3 2 2
##  [205] 4 4 2 2 2 3 5 3 6 4 2 4 4 4 5 2 2 6 2 6 2 3 1 1 6 1 4 1 3 3 3 3 5 5
##  [239] 4 3 1 4 6 5 1 5 6 1 3 4 2 4 1 6 3 4 1 3 2 3 4 4 4 5 4 6 4 6 3 1 6 2
##  [273] 5 1 6 6 2 6 4 4 1 3 3 2 2 5 5 6 6 5 3 5 6 2 5 1 5 6 6 6 4 4 1 2 3 2
```

```
## [307] 1 5 3 6 1 1 1 3 3 5 4 5 3 1 2 5 3 4 6 1 6 1 1 4 6 4 3 5 4 5 4 5 5 3
## [341] 6 5 3 2 5 5 1 4 3 6 5 5 3 2 2 1 6 5 3 1 2 4 6 6 1 2 5 2 6 2 3 3 1 3
## [375] 1 6 1 5 2 1 1 5 2 5 2 6 6 5 1 2 4 2 4 5 6 2 6 6 3 4 5 1 5 3 6 3 5 6
## [409] 3 2 1 5 5 3 1 6 6 5 3 2 5 5 2 3 4 4 5 3 6 1 6 2 6 2 4 6 3 1 2 5 4 5
## [443] 6 5 3 2 1 2 1 5 3 5 2 5 3 2 4 5 5 5 5 3 1 6 3 5 2 4 4 3 4 3 3 5 1 3
## [477] 1 2 1 4 2 1 2 1 4 6 6 3 6 5 3 3 2 6 3 1 5 1 5 1 6 1 2 4 3 3 4 3 2 6
## [511] 5 5 5 6 3 2 3 1 2 6 2 1 2 1 3 3 5 3 4 5 4 1 2 4 6 6 5 2 4 1 3 6 3 4
## [545] 1 1 5 1 3 1 2 6 2 6 2 4 5 1 3 1 5 6 2 3 4 2 3 2 2 5 5 6 1 4 6 3 3 5
## [579] 6 2 2 3 5 4 3 3 2 4 4 3 1 4 1 5 1 1 1 3 5 3 2 5 2 3 3 6 4 5 2 4 3 6
## [613] 3 4 6 4 3 2 1 4 5 4 5 4 2 3 3 3 4 6 2 5 3 4 3 4 5 6 6 4 4 6 4 6 5 2
## [647] 4 1 2 6 2 6 5 2 4 4 5 4 5 6 2 6 4 3 3 4 3 1 1 3 4 5 1 1 5 6 5 3 4 4
## [681] 4 3 3 1 1 4 2 3 1 4 3 4 6 5 4 4 5 4 2 4 4 5 3 4 2 1 5 3 1 2 5 6 2 1
## [715] 6 6 5 5 3 3 2 2 5 4 6 3 2 2 1 1 6 6 4 2 5 2 2 1 2 4 5 6 3 6 6 2 1 4
## [749] 4 6 2 2 4 2 1 6 6 4 6 3 5 2 4 6 3 5 5 4 3 5 4 5 2 1 1 4 2 5 4 1 3 2
## [783] 5 1 4 1 3 2 6 1 4 2 1 6 5 3 2 1 4 5 1 5 6 5 6 5 6 2 5 5 4 2 4 4 3 1
## [817] 2 6 1 5 1 2 6 3 1 1 4 3 4 6 1 2 4 3 3 2 4 4 1 2 3 2 2 3 4 6 1 3 5 4
## [851] 3 3 5 2 4 1 5 6 2 4 6 3 2 1 5 4 6 1 1 3 4 2 6 4 5 1 5 1 6 2 2 5 2 3
## [885] 4 5 6 1 1 6 3 2 5 2 2 1 3 5 3 6 5 1 1 6 2 3 5 1 2 2 2 2 5 4 6 1 6 6
## [919] 2 2 2 3 6 6 6 5 5 2 2 6 4 6 5 5 6 6 6 4 5 1 5 5 4 4 5 4 4 1 3 1 5 5
## [953] 1 5 3 2 2 3 3 3 3 3 5 3 3 4 1 4 1 5 2 4 5 5 4 1 2 5 4 3 4 6 5 2 5 2
## [987] 6 3 6 2 5 4 3 5 6 1 3 3 4 1
```

b. mean and sd of sample

```r
mean(x)
```

```
## [1] 3.532
```

```r
sd(x)
```

```
## [1] 1.673253
```

c. how many times 6 occurs

```r
y<-x==6
sum(y)
```

```
## [1] 155
```

d. Table function to show frequency of values

```r
table(x)
```

```
## x
##   1   2   3   4   5   6
## 152 168 171 169 185 155
```

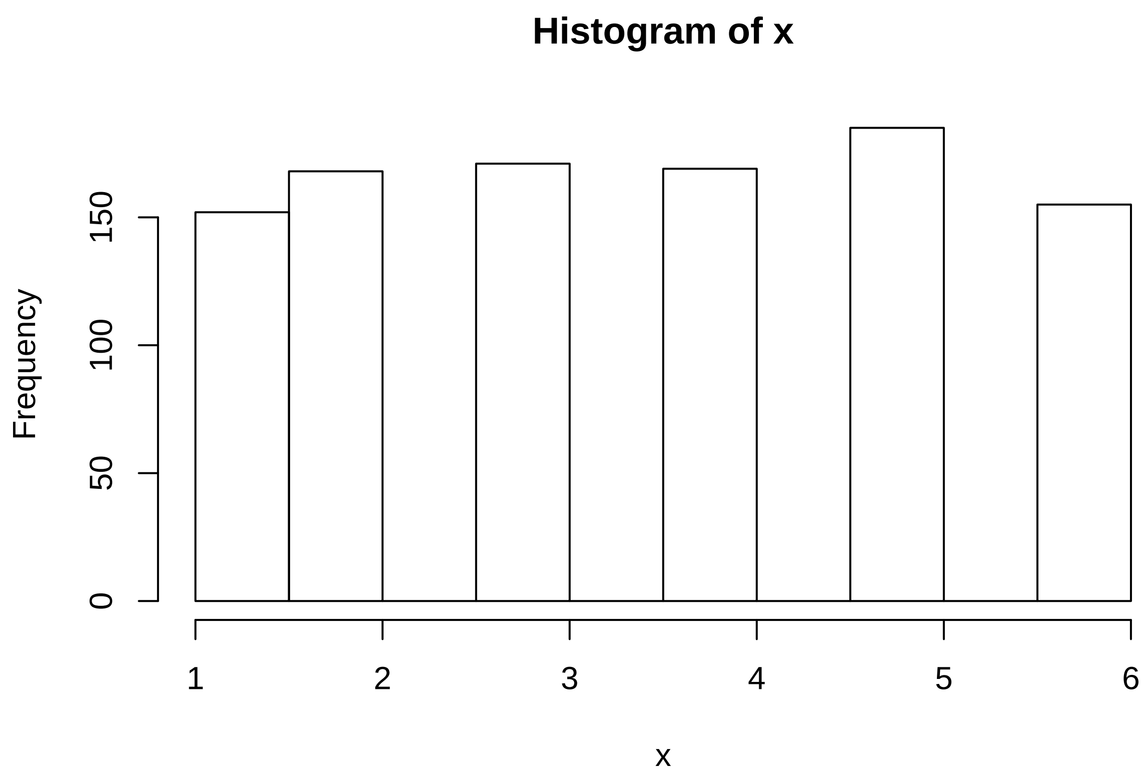
e. Relative Frequency of values

```
prop.table(table(x))
```

```
## x
##     1     2     3     4     5     6
## 0.152 0.168 0.171 0.169 0.185 0.155
```

f. Plot Frequency of values

```
hist(x)
```



4. Experiment tossing 3 dice

```
X1<-sample(c(1:6),1000,replace=TRUE)
X2<-sample(c(1:6),1000,replace=TRUE)
X3<-sample(c(1:6),1000,replace=TRUE)
```

a. P(X1>X2+X3)

```r
y<-X1>(X2+X3)
sum(y)/1000
```

```
## [1] 0.095
```

b. (P(X1$^{2>X2}$2+X3^2))

```r
z<- X1^2>X2^2+X3^2
sum(z)
```

```
## [1] 226
```

5. Estimate probability of 3 tails in a row (using matrix)

```r
x<- matrix(sample(c(0,1),3000,replace=TRUE), (nrows=1000))
y<-rowSums(x)==3
sum(y)/1000
```

```
## [1] 0.114
```

6. Extra Credit

7. Central Limit Theorem

Generate 100 samples of 1000 observations

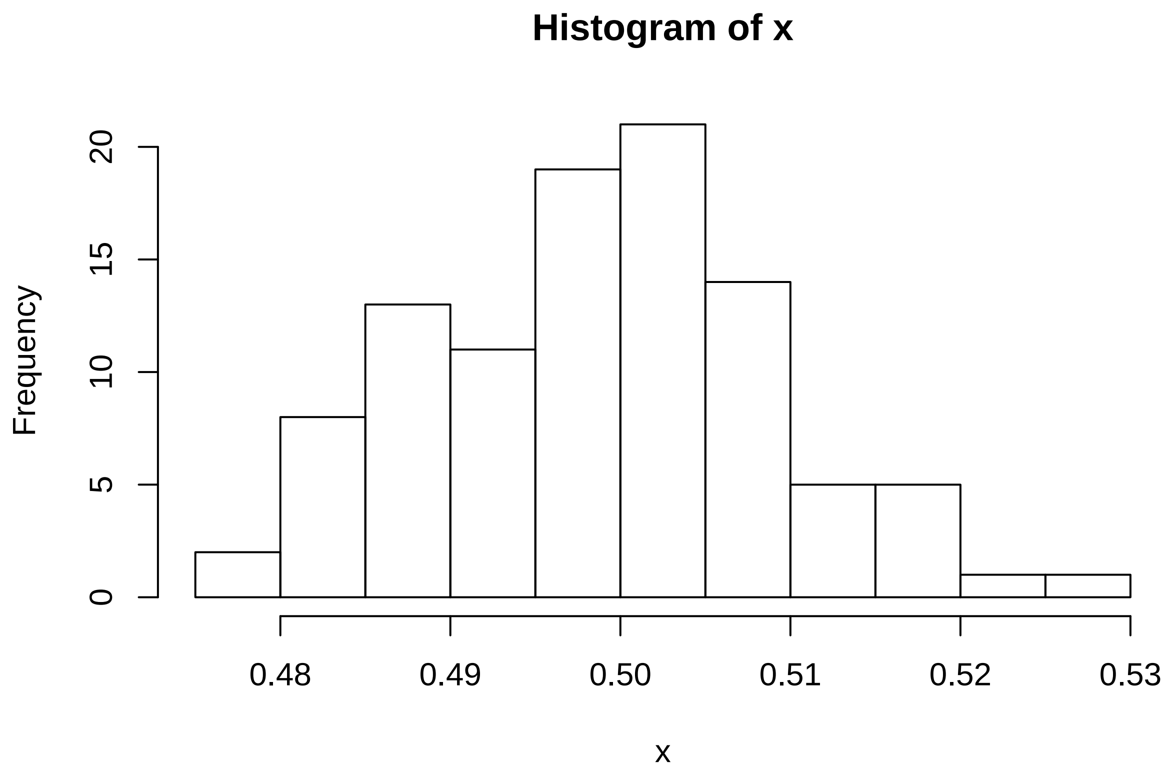
```r
A<-matrix(sample(runif(n=10^5,min=0,max=1)),(nrows=100))
```

Means of each sample

```r
x<-rowSums(A)/1000
```

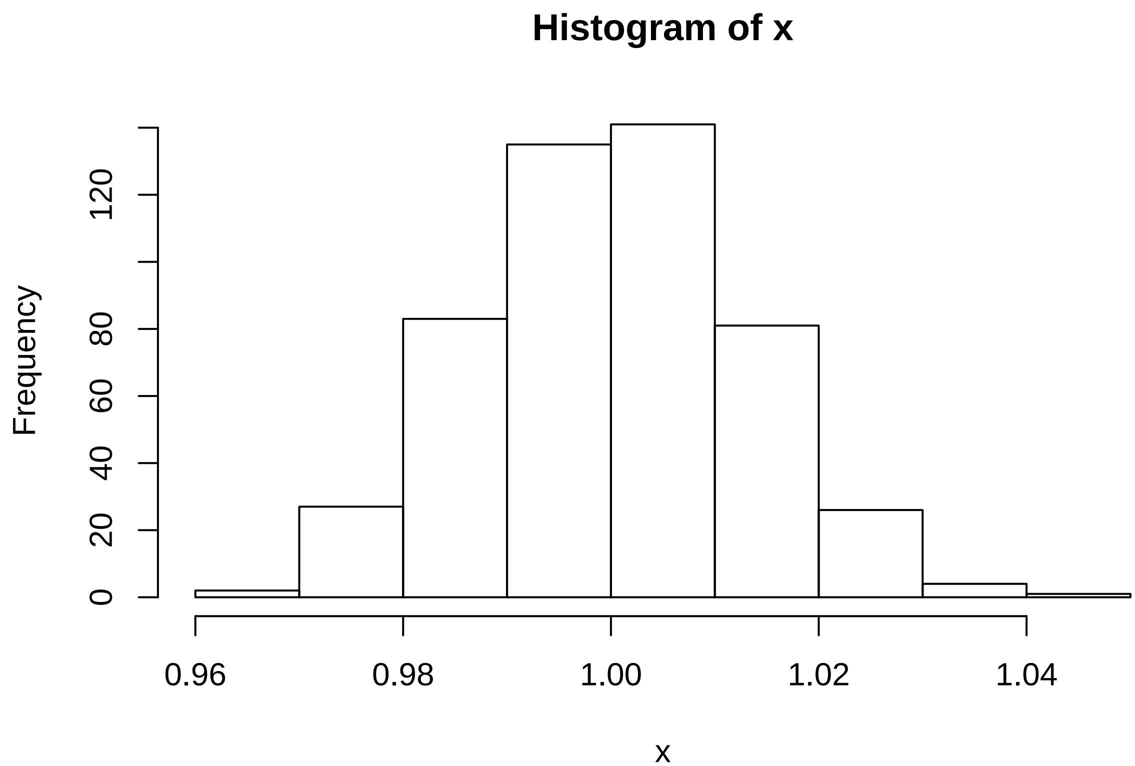
Plot histogram of x

```r
hist(x)
```



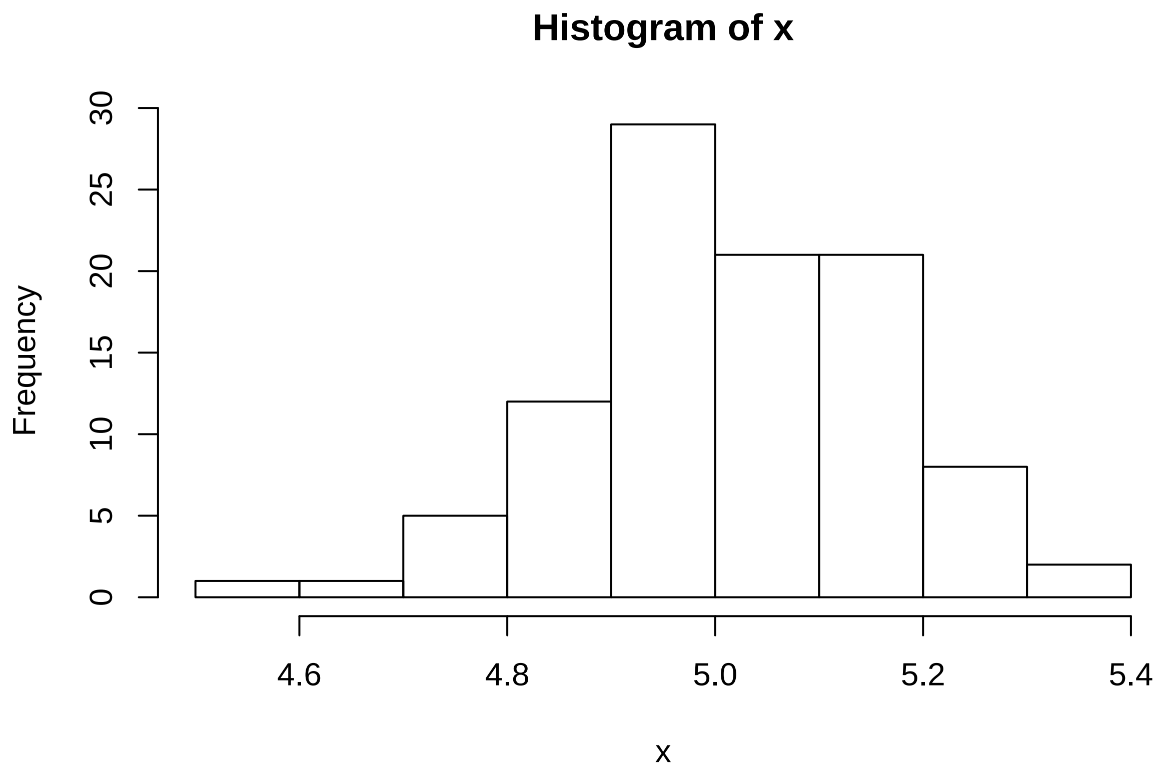
yes, the distribution looks normal ### Up the numbers (500 samples of 2000 observations)

```
A<-matrix(sample(runif(n=10^6,min=0,max=1)),(nrows=500))
x<-rowSums(A)/1000
hist(x)
```



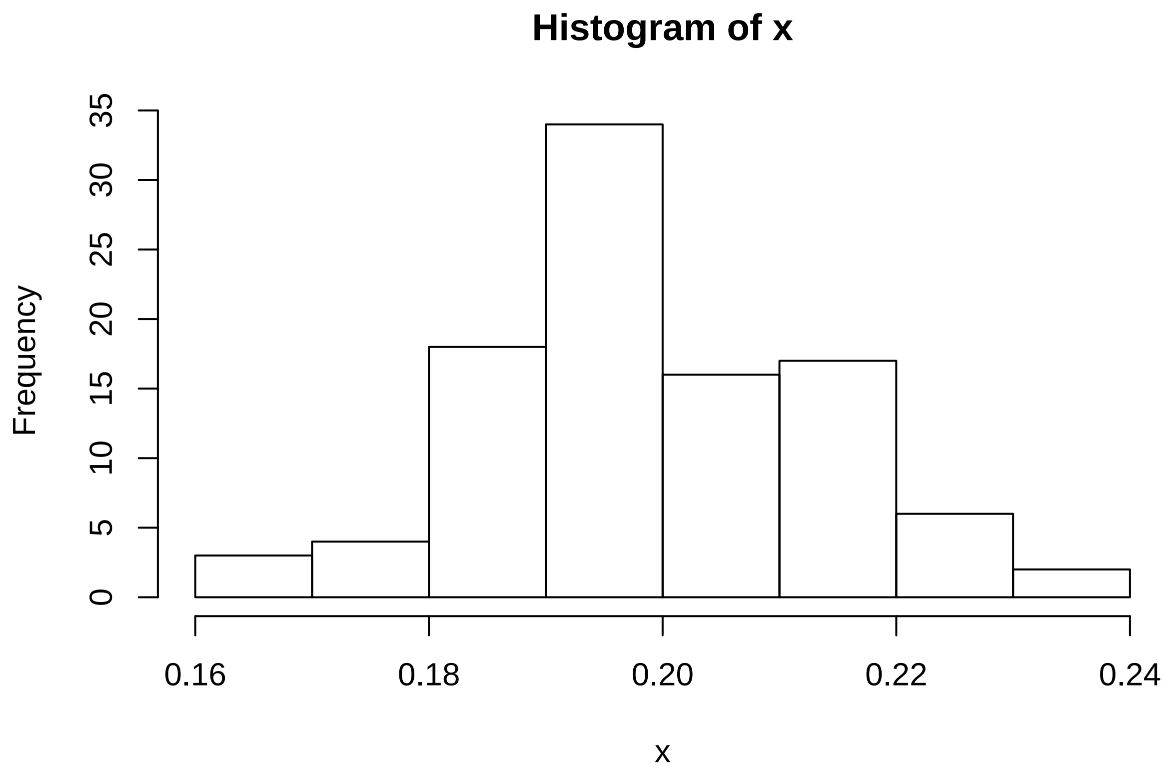
This distribution looks more normal ### Two more distributions #### Exponential Distribution (n=1000, lambda rate=.2) per sample

```
A<-matrix(sample(rexp(n=10^5,rate=.2)),(nrows=100))
x<-rowSums(A)/1000
hist(x)
```



histogram looks relatively normal #### Poisson distribution (n=1000, lambda=.2) per sample

```
A<-matrix(sample(rpois(n=10^5,lambda=.2)),(nrows=100))
x<-rowSums(A)/1000
hist(x)
```



histogram looks normal # Part 2 - Working with Data ## 7. Read in titanic dataset. Use str to see summary

```
titanic<-read.csv(file='C:/Users/student/Documents/MATH421/data/titanic.csv', header=TRUE, sep=',')
str(titanic)
```

```
## 'data.frame':    891 obs. of  12 variables:
##  $ PassengerId: int  1 2 3 4 5 6 7 8 9 10 ...
##  $ Survived   : int  0 1 1 1 0 0 0 0 1 1 ...
##  $ Pclass     : int  3 1 3 1 3 3 1 3 3 2 ...
##  $ Name       : Factor w/ 891 levels "Abbing, Mr. Anthony",..: 109 191 358 277 16 559 520 629 417 58
##  $ Sex        : Factor w/ 2 levels "female","male": 2 1 1 1 2 2 2 2 1 1 ...
##  $ Age        : num  22 38 26 35 35 NA 54 2 27 14 ...
##  $ SibSp      : int  1 1 0 1 0 0 0 3 0 1 ...
##  $ Parch      : int  0 0 0 0 0 0 0 1 2 0 ...
##  $ Ticket     : Factor w/ 681 levels "110152","110413",..: 524 597 670 50 473 276 86 396 345 133 ...
##  $ Fare       : num  7.25 71.28 7.92 53.1 8.05 ...
##  $ Cabin      : Factor w/ 148 levels "","A10","A14",..: 1 83 1 57 1 1 131 1 1 1 ...
##  $ Embarked   : Factor w/ 4 levels "","C","Q","S": 4 2 4 4 4 3 4 4 4 2 ...
```

##8. Print first 10 rows in markdown

```
library(kableExtra)
knitr::kable(titanic[1:10,], format='markdown')
```

PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
1	0	3	Braund, Mr. Owen Harris	male	22	1	0	A/5 21171	7.2500		S
2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Thayer)	female	38	1	0	PC 17599	71.2833	C85	C
3	1	3	Heikkinen, Miss. Laina	female	26	0	0	STON/O2. 3101282	7.9250		S
4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35	1	0	113803	53.1000	C123	S
5	0	3	Allen, Mr. William Henry	male	35	0	0	373450	8.0500		S
6	0	3	Moran, Mr. James	male	NA	0	0	330877	8.4583		Q
7	0	1	McCarthy, Mr. Timothy J	male	54	0	0	17463	51.8625	E46	S
8	0	3	Palsson, Master. Gosta Leonard	male	2	3	1	349909	21.0750		S
9	1	3	Johnson, Mrs. Oscar W (Elisabeth Vilhelmina Berg)	female	27	0	2	347742	11.1333		S
10	1	2	Nasser, Mrs. Nicholas (Adele Achem)	female	14	1	0	237736	30.0708		C

##9. Count missing values in data, count missing values in each columns

```r
x<-is.na(titanic)
sum(x)
```

```
## [1] 177
```

```r
colSums(x)
```

```
## PassengerId    Survived      Pclass        Name         Sex         Age 
##           0           0           0           0           0         177 
##       SibSp       Parch      Ticket        Fare       Cabin    Embarked 
##           0           0           0           0           0           0
```

##10. Average Age of passengers

```r
colMeans(titanic['Age'],na.rm=TRUE)
```

```
##      Age 
## 29.69912
```

##11. Replace missing values by the mean

```r
titanicreplace<-replace(titanic, is.na(titanic),colMeans(titanic['Age'],na.rm=TRUE))
```

##12. Remove Name, ID, Ticket, Cabin

```
newtitanic<-titanicreplace[-c(1,4,9,11)]
```

##13. Mean age of female passengers

```
femtitanic<-subset(newtitanic, Sex=='female')
colMeans(femtitanic['Age'])
```

```
##      Age
## 28.21673
```

##14. Median fare of class 1 Passengers

```
classone<-subset(newtitanic, Pclass==1)
classfare<-classone$Fare
median(classfare)
```

```
## [1] 60.2875
```

##15. Median fare of non Class 1 female passengers

```
nonclassfemale<-subset(newtitanic, Pclass!=1 & Sex=='female')
nonclassfemalefare<-nonclassfemale$Fare
median(nonclassfemalefare)
```

```
## [1] 14.45625
```

##16. Calculate the median age of survived passengers who are female and Class 1 or Class 2

```
survfemnon3<-subset(newtitanic,Pclass!=3 & Sex=='female' & Survived==1)
survfemnon3age<-survfemnon3$Age
median(survfemnon3age)
```

```
## [1] 30
```

##17. Calculate the mean fare of female teenagers survived passengers

```
femteensurv<-subset(newtitanic,Sex=='female' & Survived==1 & Age>=13 & Age <20)
colMeans(femteensurv['Fare'])
```

```
##     Fare
## 49.17966
```

##18. Calculate the mean fare of female teenagers survived passengers for each class

```
femteensurv<-subset(newtitanic,Sex=='female' & Survived==1 & Age>=13 & Age <20)
means<-aggregate(femteensurv['Fare'],list(femteensurv$Pclass),mean)
means
```

```
##   Group.1       Fare
## 1       1 107.540708
## 2       2  20.008850
## 3       3   8.769885
```

##19. . Calculate the ratio of Survived and not Survived for passengers who pays more than the average fare

```
abovefare<-newtitanic[newtitanic['Fare']>mean(newtitanic$Fare,na.rm=TRUE),]
abovefare #shows there are 211 rows in the abovefare dataset
```

```
##     Survived Pclass    Sex      Age SibSp Parch     Fare Embarked
## 2          1      1 female 38.00000     1     0  71.2833        C
## 4          1      1 female 35.00000     1     0  53.1000        S
## 7          0      1   male 54.00000     0     0  51.8625        S
## 24         1      1   male 28.00000     0     0  35.5000        S
## 28         0      1   male 19.00000     3     2 263.0000        S
## 32         1      1 female 29.69912     1     0 146.5208        C
## 35         0      1   male 28.00000     1     0  82.1708        C
## 36         0      1   male 42.00000     1     0  52.0000        S
## 44         1      2 female  3.00000     1     2  41.5792        C
## 51         0      3   male  7.00000     4     1  39.6875        S
## 53         1      1 female 49.00000     1     0  76.7292        C
## 55         0      1   male 65.00000     0     1  61.9792        C
## 56         1      1   male 29.69912     0     0  35.5000        S
## 60         0      3   male 11.00000     5     2  46.9000        S
## 62         1      1 female 38.00000     0     0  80.0000
## 63         0      1   male 45.00000     1     0  83.4750        S
## 72         0      3 female 16.00000     5     2  46.9000        S
## 73         0      2   male 21.00000     0     0  73.5000        S
## 75         1      3   male 32.00000     0     0  56.4958        S
## 84         0      1   male 28.00000     0     0  47.1000        S
## 87         0      3   male 16.00000     1     3  34.3750        S
## 89         1      1 female 23.00000     3     2 263.0000        S
## 93         0      1   male 46.00000     1     0  61.1750        S
## 97         0      1   male 71.00000     0     0  34.6542        C
## 98         1      1   male 23.00000     0     1  63.3583        C
## 103        0      1   male 21.00000     0     1  77.2875        S
## 111        0      1   male 47.00000     0     0  52.0000        S
## 119        0      1   male 24.00000     0     1 247.5208        C
## 121        0      2   male 21.00000     2     0  73.5000        S
## 125        0      1   male 54.00000     0     1  77.2875        S
## 138        0      1   male 37.00000     1     0  53.1000        S
## 140        0      1   male 24.00000     0     0  79.2000        C
## 146        0      2   male 19.00000     1     1  36.7500        S
## 148        0      3 female  9.00000     2     2  34.3750        S
## 152        1      1 female 22.00000     1     0  66.6000        S
## 156        0      1   male 51.00000     0     1  61.3792        C
## 160        0      3   male 29.69912     8     2  69.5500        S
## 165        0      3   male  1.00000     4     1  39.6875        S
## 167        1      1 female 29.69912     0     1  55.0000        S
## 170        0      3   male 28.00000     0     0  56.4958        S
## 171        0      1   male 61.00000     0     0  33.5000        S
```

```
## 181        0      3 female 29.69912     8     2  69.5500          S
## 184        1      2   male  1.00000     2     1  39.0000          S
## 186        0      1   male 29.69912     0     0  50.0000          S
## 196        1      1 female 58.00000     0     0 146.5208          C
## 202        0      3   male 29.69912     8     2  69.5500          S
## 216        1      1 female 31.00000     1     0 113.2750          C
## 219        1      1 female 32.00000     0     0  76.2917          C
## 225        1      1   male 38.00000     1     0  90.0000          S
## 231        1      1 female 35.00000     1     0  83.4750          S
## 246        0      1   male 44.00000     2     0  90.0000          Q
## 249        1      1   male 37.00000     1     1  52.5542          S
## 257        1      1 female 29.69912     0     0  79.2000          C
## 258        1      1 female 30.00000     0     0  86.5000          S
## 259        1      1 female 35.00000     0     0 512.3292          C
## 263        0      1   male 52.00000     1     1  79.6500          S
## 267        0      3   male 16.00000     4     1  39.6875          S
## 269        1      1 female 58.00000     0     1 153.4625          S
## 270        1      1 female 35.00000     0     0 135.6333          S
## 276        1      1 female 63.00000     1     0  77.9583          S
## 291        1      1 female 26.00000     0     0  78.8500          S
## 292        1      1 female 19.00000     1     0  91.0792          C
## 298        0      1 female  2.00000     1     2 151.5500          S
## 300        1      1 female 50.00000     0     1 247.5208          C
## 306        1      1   male  0.92000     1     2 151.5500          S
## 307        1      1 female 29.69912     0     0 110.8833          C
## 308        1      1 female 17.00000     1     0 108.9000          C
## 310        1      1 female 30.00000     0     0  56.9292          C
## 311        1      1 female 24.00000     0     0  83.1583          C
## 312        1      1 female 18.00000     2     2 262.3750          C
## 319        1      1 female 31.00000     0     2 164.8667          S
## 320        1      1 female 40.00000     1     1 134.5000          C
## 325        0      3   male 29.69912     8     2  69.5500          S
## 326        1      1 female 36.00000     0     0 135.6333          C
## 330        1      1 female 16.00000     0     1  57.9792          C
## 333        0      1   male 38.00000     0     1 153.4625          S
## 335        1      1 female 29.69912     1     0 133.6500          S
## 337        0      1   male 29.00000     1     0  66.6000          S
## 338        1      1 female 41.00000     0     0 134.5000          C
## 340        0      1   male 45.00000     0     0  35.5000          S
## 342        1      1 female 24.00000     3     2 263.0000          S
## 352        0      1   male 29.69912     0     0  35.0000          S
## 357        1      1 female 22.00000     0     1  55.0000          S
## 367        1      1 female 60.00000     1     0  75.2500          C
## 370        1      1 female 24.00000     0     0  69.3000          C
## 371        1      1   male 25.00000     1     0  55.4417          C
## 374        0      1   male 22.00000     0     0 135.6333          C
## 376        1      1 female 29.69912     1     0  82.1708          C
## 378        0      1   male 27.00000     0     2 211.5000          C
## 381        1      1 female 42.00000     0     0 227.5250          C
## 384        1      1 female 35.00000     1     0  52.0000          S
## 386        0      2   male 18.00000     0     0  73.5000          S
## 387        0      3   male  1.00000     5     2  46.9000          S
## 391        1      1   male 36.00000     1     2 120.0000          S
## 394        1      1 female 23.00000     1     0 113.2750          C
```

```
## 413        1      1 female 33.00000     1     0  90.0000        Q
## 417        1      2 female 34.00000     1     1  32.5000        S
## 435        0      1   male 50.00000     1     0  55.9000        S
## 436        1      1 female 14.00000     1     2 120.0000        S
## 437        0      3 female 21.00000     2     2  34.3750        S
## 439        0      1   male 64.00000     1     4 263.0000        S
## 446        1      1   male  4.00000     0     2  81.8583        S
## 454        1      1   male 49.00000     1     0  89.1042        C
## 458        1      1 female 29.69912     1     0  51.8625        S
## 463        0      1   male 47.00000     0     0  38.5000        S
## 476        0      1   male 29.69912     0     0  52.0000        S
## 481        0      3   male  9.00000     5     2  46.9000        S
## 485        1      1   male 25.00000     1     0  91.0792        C
## 487        1      1 female 35.00000     1     0  90.0000        S
## 494        0      1   male 71.00000     0     0  49.5042        C
## 497        1      1 female 54.00000     1     0  78.2667        C
## 499        0      1 female 25.00000     1     2 151.5500        S
## 505        1      1 female 16.00000     0     0  86.5000        S
## 506        0      1   male 18.00000     1     0 108.9000        C
## 510        1      3   male 26.00000     0     0  56.4958        S
## 514        1      1 female 54.00000     1     0  59.4000        C
## 516        0      1   male 47.00000     0     0  34.0208        S
## 521        1      1 female 30.00000     0     0  93.5000        S
## 524        1      1 female 44.00000     0     1  57.9792        C
## 528        0      1   male 29.69912     0     0 221.7792        S
## 538        1      1 female 30.00000     0     0 106.4250        C
## 540        1      1 female 22.00000     0     2  49.5000        C
## 541        1      1 female 36.00000     0     2  71.0000        S
## 545        0      1   male 50.00000     1     0 106.4250        C
## 550        1      2   male  8.00000     1     1  36.7500        S
## 551        1      1   male 17.00000     0     2 110.8833        C
## 557        1      1 female 48.00000     1     0  39.6000        C
## 558        0      1   male 29.69912     0     0 227.5250        C
## 559        1      1 female 39.00000     1     1  79.6500        S
## 572        1      1 female 53.00000     2     0  51.4792        S
## 578        1      1 female 39.00000     1     0  55.9000        S
## 582        1      1 female 39.00000     1     1 110.8833        C
## 584        0      1   male 36.00000     0     0  40.1250        C
## 586        1      1 female 18.00000     0     2  79.6500        S
## 588        1      1   male 60.00000     1     1  79.2000        C
## 592        1      1 female 52.00000     1     0  78.2667        C
## 597        1      2 female 29.69912     0     0  33.0000        S
## 600        1      1   male 49.00000     1     0  56.9292        C
## 603        0      1   male 29.69912     0     0  42.4000        S
## 609        1      2 female 22.00000     1     2  41.5792        C
## 610        1      1 female 40.00000     0     0 153.4625        S
## 616        1      2 female 24.00000     1     2  65.0000        S
## 619        1      2 female  4.00000     2     1  39.0000        S
## 622        1      1   male 42.00000     1     0  52.5542        S
## 626        0      1   male 61.00000     0     0  32.3208        S
## 628        1      1 female 21.00000     0     0  77.9583        S
## 639        0      3 female 41.00000     0     5  39.6875        S
## 642        1      1 female 24.00000     0     0  69.3000        C
## 644        1      3   male 29.69912     0     0  56.4958        S
```

```
## 646         1       1   male 48.00000     1     0  76.7292         C
## 648         1       1   male 56.00000     0     0  35.5000         C
## 656         0       2   male 24.00000     2     0  73.5000         S
## 660         0       1   male 58.00000     0     2 113.2750         C
## 661         1       1   male 50.00000     2     0 133.6500         S
## 666         0       2   male 32.00000     2     0  73.5000         S
## 670         1       1 female 29.69912     1     0  52.0000         S
## 671         1       2 female 40.00000     1     1  39.0000         S
## 672         0       1   male 31.00000     1     0  52.0000         S
## 679         0       3 female 43.00000     1     6  46.9000         S
## 680         1       1   male 36.00000     0     1 512.3292         C
## 682         1       1   male 27.00000     0     0  76.7292         C
## 684         0       3   male 14.00000     5     2  46.9000         S
## 685         0       2   male 60.00000     1     1  39.0000         S
## 686         0       2   male 25.00000     1     2  41.5792         C
## 687         0       3   male 14.00000     4     1  39.6875         S
## 690         1       1 female 15.00000     0     1 211.3375         S
## 691         1       1   male 31.00000     1     0  57.0000         S
## 693         1       3   male 29.69912     0     0  56.4958         S
## 699         0       1   male 49.00000     1     1 110.8833         C
## 701         1       1 female 18.00000     1     0 227.5250         C
## 709         1       1 female 22.00000     0     0 151.5500         S
## 711         1       1 female 24.00000     0     0  49.5042         C
## 713         1       1   male 48.00000     1     0  52.0000         S
## 717         1       1 female 38.00000     0     0 227.5250         C
## 721         1       2 female  6.00000     0     1  33.0000         S
## 725         1       1   male 27.00000     1     0  53.1000         S
## 731         1       1 female 29.00000     0     0 211.3375         S
## 737         0       3 female 48.00000     1     3  34.3750         S
## 738         1       1   male 35.00000     0     0 512.3292         C
## 742         0       1   male 36.00000     1     0  78.8500         S
## 743         1       1 female 21.00000     2     2 262.3750         C
## 746         0       1   male 70.00000     1     1  71.0000         S
## 749         0       1   male 19.00000     1     0  53.1000         S
## 755         1       2 female 48.00000     1     2  65.0000         S
## 760         1       1 female 33.00000     0     0  86.5000         S
## 764         1       1 female 36.00000     1     2 120.0000         S
## 766         1       1 female 51.00000     1     0  77.9583         S
## 767         0       1   male 29.69912     0     0  39.6000         C
## 780         1       1 female 43.00000     0     1 211.3375         S
## 782         1       1 female 17.00000     1     0  57.0000         S
## 790         0       1   male 46.00000     0     0  79.2000         C
## 793         0       3 female 29.69912     8     2  69.5500         S
## 803         1       1   male 11.00000     1     2 120.0000         S
## 810         1       1 female 33.00000     1     0  53.1000         S
## 818         0       2   male 31.00000     1     1  37.0042         C
## 821         1       1 female 52.00000     1     1  93.5000         S
## 825         0       3   male  2.00000     4     1  39.6875         S
## 827         0       3   male 29.69912     0     0  56.4958         S
## 828         1       2   male  1.00000     0     2  37.0042         C
## 830         1       1 female 62.00000     0     0  80.0000
## 836         1       1 female 39.00000     1     1  83.1583         C
## 839         1       3   male 32.00000     0     0  56.4958         S
## 847         0       3   male 29.69912     8     2  69.5500         S
```

```
## 849        0      2   male 28.00000     0     1  33.0000        S
## 850        1      1 female 29.69912     1     0  89.1042        C
## 854        1      1 female 16.00000     0     1  39.4000        S
## 857        1      1 female 45.00000     1     1 164.8667        S
## 864        0      3 female 29.69912     8     2  69.5500        S
## 868        0      1   male 31.00000     0     0  50.4958        S
## 872        1      1 female 47.00000     1     1  52.5542        S
## 880        1      1 female 56.00000     0     1  83.1583        C
```

```
sum(abovefare['Survived'])/(211-sum(abovefare['Survived'])) #ratio of survived to not survived aka ther
```

```
## [1] 1.482353
```

##20. . Add column that standardizes the fare (subtract the mean and divide by standard deviation) and name it sfare

```
newtitanic$sfare<-(newtitanic$Fare-mean(newtitanic$Fare,na.rm=TRUE))/sd(newtitanic$Fare,na.rm=TRUE)
```

##21. Add categorical variable named cfare that takes value cheap for passengers paying less the average fare and takes value expensive for passengers paying more than the average fare.

```
newtitanic$cfare<-ifelse(newtitanic$Fare<mean(newtitanic$Fare,na.rm=TRUE),'Cheap','Expensive')
```

##22. Add categorical variable named cage that takes value 0 for age 0-10, 1 for age 10-20, 2 for age 20-30, and so on

```
newtitanic$cage<-99
newtitanic$cage[newtitanic$Age<10]<-0
newtitanic$cage[newtitanic$Age>=10&newtitanic$Age<20]<-1
newtitanic$cage[newtitanic$Age>=20&newtitanic$Age<30]<-2
newtitanic$cage[newtitanic$Age>=30&newtitanic$Age<40]<-3
newtitanic$cage[newtitanic$Age>=40&newtitanic$Age<50]<-4
newtitanic$cage[newtitanic$Age>=50&newtitanic$Age<60]<-5
newtitanic$cage[newtitanic$Age>=60&newtitanic$Age<70]<-6
newtitanic$cage[newtitanic$Age>=70&newtitanic$Age<80]<-7
newtitanic$cage[newtitanic$Age>=80]<-8
newtitanic
```

```
##     Survived Pclass    Sex      Age SibSp Parch     Fare Embarked
## 1          0      3   male 22.00000     1     0   7.2500        S
## 2          1      1 female 38.00000     1     0  71.2833        C
## 3          1      3 female 26.00000     0     0   7.9250        S
## 4          1      1 female 35.00000     1     0  53.1000        S
## 5          0      3   male 35.00000     0     0   8.0500        S
## 6          0      3   male 29.69912     0     0   8.4583        Q
## 7          0      1   male 54.00000     0     0  51.8625        S
## 8          0      3   male  2.00000     3     1  21.0750        S
## 9          1      3 female 27.00000     0     2  11.1333        S
## 10         1      2 female 14.00000     1     0  30.0708        C
## 11         1      3 female  4.00000     1     1  16.7000        S
## 12         1      1 female 58.00000     0     0  26.5500        S
## 13         0      3   male 20.00000     0     0   8.0500        S
```

```
## 14         0      3   male 39.00000     1     5  31.2750        S
## 15         0      3 female 14.00000     0     0   7.8542        S
## 16         1      2 female 55.00000     0     0  16.0000        S
## 17         0      3   male  2.00000     4     1  29.1250        Q
## 18         1      2   male 29.69912     0     0  13.0000        S
## 19         0      3 female 31.00000     1     0  18.0000        S
## 20         1      3 female 29.69912     0     0   7.2250        C
## 21         0      2   male 35.00000     0     0  26.0000        S
## 22         1      2   male 34.00000     0     0  13.0000        S
## 23         1      3 female 15.00000     0     0   8.0292        Q
## 24         1      1   male 28.00000     0     0  35.5000        S
## 25         0      3 female  8.00000     3     1  21.0750        S
## 26         1      3 female 38.00000     1     5  31.3875        S
## 27         0      3   male 29.69912     0     0   7.2250        C
## 28         0      1   male 19.00000     3     2 263.0000        S
## 29         1      3 female 29.69912     0     0   7.8792        Q
## 30         0      3   male 29.69912     0     0   7.8958        S
## 31         0      1   male 40.00000     0     0  27.7208        C
## 32         1      1 female 29.69912     1     0 146.5208        C
## 33         1      3 female 29.69912     0     0   7.7500        Q
## 34         0      2   male 66.00000     0     0  10.5000        S
## 35         0      1   male 28.00000     1     0  82.1708        C
## 36         0      1   male 42.00000     1     0  52.0000        S
## 37         1      3   male 29.69912     0     0   7.2292        C
## 38         0      3   male 21.00000     0     0   8.0500        S
## 39         0      3 female 18.00000     2     0  18.0000        S
## 40         1      3 female 14.00000     1     0  11.2417        C
## 41         0      3 female 40.00000     1     0   9.4750        S
## 42         0      2 female 27.00000     1     0  21.0000        S
## 43         0      3   male 29.69912     0     0   7.8958        C
## 44         1      2 female  3.00000     1     2  41.5792        C
## 45         1      3 female 19.00000     0     0   7.8792        Q
## 46         0      3   male 29.69912     0     0   8.0500        S
## 47         0      3   male 29.69912     1     0  15.5000        Q
## 48         1      3 female 29.69912     0     0   7.7500        Q
## 49         0      3   male 29.69912     2     0  21.6792        C
## 50         0      3 female 18.00000     1     0  17.8000        S
## 51         0      3   male  7.00000     4     1  39.6875        S
## 52         0      3   male 21.00000     0     0   7.8000        S
## 53         1      1 female 49.00000     1     0  76.7292        C
## 54         1      2 female 29.00000     1     0  26.0000        S
## 55         0      1   male 65.00000     0     1  61.9792        C
## 56         1      1   male 29.69912     0     0  35.5000        S
## 57         1      2 female 21.00000     0     0  10.5000        S
## 58         0      3   male 28.50000     0     0   7.2292        C
## 59         1      2 female  5.00000     1     2  27.7500        S
## 60         0      3   male 11.00000     5     2  46.9000        S
## 61         0      3   male 22.00000     0     0   7.2292        C
## 62         1      1 female 38.00000     0     0  80.0000
## 63         0      1   male 45.00000     1     0  83.4750        S
## 64         0      3   male  4.00000     3     2  27.9000        S
## 65         0      1   male 29.69912     0     0  27.7208        C
## 66         1      3   male 29.69912     1     1  15.2458        C
## 67         1      2 female 29.00000     0     0  10.5000        S
```

```
## 68          0      3   male 19.00000     0     0   8.1583         S
## 69          1      3 female 17.00000     4     2   7.9250         S
## 70          0      3   male 26.00000     2     0   8.6625         S
## 71          0      2   male 32.00000     0     0  10.5000         S
## 72          0      3 female 16.00000     5     2  46.9000         S
## 73          0      2   male 21.00000     0     0  73.5000         S
## 74          0      3   male 26.00000     1     0  14.4542         C
## 75          1      3   male 32.00000     0     0  56.4958         S
## 76          0      3   male 25.00000     0     0   7.6500         S
## 77          0      3   male 29.69912     0     0   7.8958         S
## 78          0      3   male 29.69912     0     0   8.0500         S
## 79          1      2   male  0.83000     0     2  29.0000         S
## 80          1      3 female 30.00000     0     0  12.4750         S
## 81          0      3   male 22.00000     0     0   9.0000         S
## 82          1      3   male 29.00000     0     0   9.5000         S
## 83          1      3 female 29.69912     0     0   7.7875         Q
## 84          0      1   male 28.00000     0     0  47.1000         S
## 85          1      2 female 17.00000     0     0  10.5000         S
## 86          1      3 female 33.00000     3     0  15.8500         S
## 87          0      3   male 16.00000     1     3  34.3750         S
## 88          0      3   male 29.69912     0     0   8.0500         S
## 89          1      1 female 23.00000     3     2 263.0000         S
## 90          0      3   male 24.00000     0     0   8.0500         S
## 91          0      3   male 29.00000     0     0   8.0500         S
## 92          0      3   male 20.00000     0     0   7.8542         S
## 93          0      1   male 46.00000     1     0  61.1750         S
## 94          0      3   male 26.00000     1     2  20.5750         S
## 95          0      3   male 59.00000     0     0   7.2500         S
## 96          0      3   male 29.69912     0     0   8.0500         S
## 97          0      1   male 71.00000     0     0  34.6542         C
## 98          1      1   male 23.00000     0     1  63.3583         C
## 99          1      2 female 34.00000     0     1  23.0000         S
## 100         0      2   male 34.00000     1     0  26.0000         S
## 101         0      3 female 28.00000     0     0   7.8958         S
## 102         0      3   male 29.69912     0     0   7.8958         S
## 103         0      1   male 21.00000     0     1  77.2875         S
## 104         0      3   male 33.00000     0     0   8.6542         S
## 105         0      3   male 37.00000     2     0   7.9250         S
## 106         0      3   male 28.00000     0     0   7.8958         S
## 107         1      3 female 21.00000     0     0   7.6500         S
## 108         1      3   male 29.69912     0     0   7.7750         S
## 109         0      3   male 38.00000     0     0   7.8958         S
## 110         1      3 female 29.69912     1     0  24.1500         Q
## 111         0      1   male 47.00000     0     0  52.0000         S
## 112         0      3 female 14.50000     1     0  14.4542         C
## 113         0      3   male 22.00000     0     0   8.0500         S
## 114         0      3 female 20.00000     1     0   9.8250         S
## 115         0      3 female 17.00000     0     0  14.4583         C
## 116         0      3   male 21.00000     0     0   7.9250         S
## 117         0      3   male 70.50000     0     0   7.7500         Q
## 118         0      2   male 29.00000     1     0  21.0000         S
## 119         0      1   male 24.00000     0     1 247.5208         C
## 120         0      3 female  2.00000     4     2  31.2750         S
## 121         0      2   male 21.00000     2     0  73.5000         S
```

```
## 122        0      3   male 29.69912     0     0   8.0500         S
## 123        0      2   male 32.50000     1     0  30.0708         C
## 124        1      2 female 32.50000     0     0  13.0000         S
## 125        0      1   male 54.00000     0     1  77.2875         S
## 126        1      3   male 12.00000     1     0  11.2417         C
## 127        0      3   male 29.69912     0     0   7.7500         Q
## 128        1      3   male 24.00000     0     0   7.1417         S
## 129        1      3 female 29.69912     1     1  22.3583         C
## 130        0      3   male 45.00000     0     0   6.9750         S
## 131        0      3   male 33.00000     0     0   7.8958         C
## 132        0      3   male 20.00000     0     0   7.0500         S
## 133        0      3 female 47.00000     1     0  14.5000         S
## 134        1      2 female 29.00000     1     0  26.0000         S
## 135        0      2   male 25.00000     0     0  13.0000         S
## 136        0      2   male 23.00000     0     0  15.0458         C
## 137        1      1 female 19.00000     0     2  26.2833         S
## 138        0      1   male 37.00000     1     0  53.1000         S
## 139        0      3   male 16.00000     0     0   9.2167         S
## 140        0      1   male 24.00000     0     0  79.2000         C
## 141        0      3 female 29.69912     0     2  15.2458         C
## 142        1      3 female 22.00000     0     0   7.7500         S
## 143        1      3 female 24.00000     1     0  15.8500         S
## 144        0      3   male 19.00000     0     0   6.7500         Q
## 145        0      2   male 18.00000     0     0  11.5000         S
## 146        0      2   male 19.00000     1     1  36.7500         S
## 147        1      3   male 27.00000     0     0   7.7958         S
## 148        0      3 female  9.00000     2     2  34.3750         S
## 149        0      2   male 36.50000     0     2  26.0000         S
## 150        0      2   male 42.00000     0     0  13.0000         S
## 151        0      2   male 51.00000     0     0  12.5250         S
## 152        1      1 female 22.00000     1     0  66.6000         S
## 153        0      3   male 55.50000     0     0   8.0500         S
## 154        0      3   male 40.50000     0     2  14.5000         S
## 155        0      3   male 29.69912     0     0   7.3125         S
## 156        0      1   male 51.00000     0     1  61.3792         C
## 157        1      3 female 16.00000     0     0   7.7333         Q
## 158        0      3   male 30.00000     0     0   8.0500         S
## 159        0      3   male 29.69912     0     0   8.6625         S
## 160        0      3   male 29.69912     8     2  69.5500         S
## 161        0      3   male 44.00000     0     1  16.1000         S
## 162        1      2 female 40.00000     0     0  15.7500         S
## 163        0      3   male 26.00000     0     0   7.7750         S
## 164        0      3   male 17.00000     0     0   8.6625         S
## 165        0      3   male  1.00000     4     1  39.6875         S
## 166        1      3   male  9.00000     0     2  20.5250         S
## 167        1      1 female 29.69912     0     1  55.0000         S
## 168        0      3 female 45.00000     1     4  27.9000         S
## 169        0      1   male 29.69912     0     0  25.9250         S
## 170        0      3   male 28.00000     0     0  56.4958         S
## 171        0      1   male 61.00000     0     0  33.5000         S
## 172        0      3   male  4.00000     4     1  29.1250         Q
## 173        1      3 female  1.00000     1     1  11.1333         S
## 174        0      3   male 21.00000     0     0   7.9250         S
## 175        0      1   male 56.00000     0     0  30.6958         C
```

```
## 176        0      3   male 18.00000     1     1   7.8542         S
## 177        0      3   male 29.69912     3     1  25.4667         S
## 178        0      1 female 50.00000     0     0  28.7125         C
## 179        0      2   male 30.00000     0     0  13.0000         S
## 180        0      3   male 36.00000     0     0   0.0000         S
## 181        0      3 female 29.69912     8     2  69.5500         S
## 182        0      2   male 29.69912     0     0  15.0500         C
## 183        0      3   male  9.00000     4     2  31.3875         S
## 184        1      2   male  1.00000     2     1  39.0000         S
## 185        1      3 female  4.00000     0     2  22.0250         S
## 186        0      1   male 29.69912     0     0  50.0000         S
## 187        1      3 female 29.69912     1     0  15.5000         Q
## 188        1      1   male 45.00000     0     0  26.5500         S
## 189        0      3   male 40.00000     1     1  15.5000         Q
## 190        0      3   male 36.00000     0     0   7.8958         S
## 191        1      2 female 32.00000     0     0  13.0000         S
## 192        0      2   male 19.00000     0     0  13.0000         S
## 193        1      3 female 19.00000     1     0   7.8542         S
## 194        1      2   male  3.00000     1     1  26.0000         S
## 195        1      1 female 44.00000     0     0  27.7208         C
## 196        1      1 female 58.00000     0     0 146.5208         C
## 197        0      3   male 29.69912     0     0   7.7500         Q
## 198        0      3   male 42.00000     0     1   8.4042         S
## 199        1      3 female 29.69912     0     0   7.7500         Q
## 200        0      2 female 24.00000     0     0  13.0000         S
## 201        0      3   male 28.00000     0     0   9.5000         S
## 202        0      3   male 29.69912     8     2  69.5500         S
## 203        0      3   male 34.00000     0     0   6.4958         S
## 204        0      3   male 45.50000     0     0   7.2250         C
## 205        1      3   male 18.00000     0     0   8.0500         S
## 206        0      3 female  2.00000     0     1  10.4625         S
## 207        0      3   male 32.00000     1     0  15.8500         S
## 208        1      3   male 26.00000     0     0  18.7875         C
## 209        1      3 female 16.00000     0     0   7.7500         Q
## 210        1      1   male 40.00000     0     0  31.0000         C
## 211        0      3   male 24.00000     0     0   7.0500         S
## 212        1      2 female 35.00000     0     0  21.0000         S
## 213        0      3   male 22.00000     0     0   7.2500         S
## 214        0      2   male 30.00000     0     0  13.0000         S
## 215        0      3   male 29.69912     1     0   7.7500         Q
## 216        1      1 female 31.00000     1     0 113.2750         C
## 217        1      3 female 27.00000     0     0   7.9250         S
## 218        0      2   male 42.00000     1     0  27.0000         S
## 219        1      1 female 32.00000     0     0  76.2917         C
## 220        0      2   male 30.00000     0     0  10.5000         S
## 221        1      3   male 16.00000     0     0   8.0500         S
## 222        0      2   male 27.00000     0     0  13.0000         S
## 223        0      3   male 51.00000     0     0   8.0500         S
## 224        0      3   male 29.69912     0     0   7.8958         S
## 225        1      1   male 38.00000     1     0  90.0000         S
## 226        0      3   male 22.00000     0     0   9.3500         S
## 227        1      2   male 19.00000     0     0  10.5000         S
## 228        0      3   male 20.50000     0     0   7.2500         S
## 229        0      2   male 18.00000     0     0  13.0000         S
```

```
## 230        0      3 female 29.69912     3     1  25.4667        S
## 231        1      1 female 35.00000     1     0  83.4750        S
## 232        0      3   male 29.00000     0     0   7.7750        S
## 233        0      2   male 59.00000     0     0  13.5000        S
## 234        1      3 female  5.00000     4     2  31.3875        S
## 235        0      2   male 24.00000     0     0  10.5000        S
## 236        0      3 female 29.69912     0     0   7.5500        S
## 237        0      2   male 44.00000     1     0  26.0000        S
## 238        1      2 female  8.00000     0     2  26.2500        S
## 239        0      2   male 19.00000     0     0  10.5000        S
## 240        0      2   male 33.00000     0     0  12.2750        S
## 241        0      3 female 29.69912     1     0  14.4542        C
## 242        1      3 female 29.69912     1     0  15.5000        Q
## 243        0      2   male 29.00000     0     0  10.5000        S
## 244        0      3   male 22.00000     0     0   7.1250        S
## 245        0      3   male 30.00000     0     0   7.2250        C
## 246        0      1   male 44.00000     2     0  90.0000        Q
## 247        0      3 female 25.00000     0     0   7.7750        S
## 248        1      2 female 24.00000     0     2  14.5000        S
## 249        1      1   male 37.00000     1     1  52.5542        S
## 250        0      2   male 54.00000     1     0  26.0000        S
## 251        0      3   male 29.69912     0     0   7.2500        S
## 252        0      3 female 29.00000     1     1  10.4625        S
## 253        0      1   male 62.00000     0     0  26.5500        S
## 254        0      3   male 30.00000     1     0  16.1000        S
## 255        0      3 female 41.00000     0     2  20.2125        S
## 256        1      3 female 29.00000     0     2  15.2458        C
## 257        1      1 female 29.69912     0     0  79.2000        C
## 258        1      1 female 30.00000     0     0  86.5000        S
## 259        1      1 female 35.00000     0     0 512.3292        C
## 260        1      2 female 50.00000     0     1  26.0000        S
## 261        0      3   male 29.69912     0     0   7.7500        Q
## 262        1      3   male  3.00000     4     2  31.3875        S
## 263        0      1   male 52.00000     1     1  79.6500        S
## 264        0      1   male 40.00000     0     0   0.0000        S
## 265        0      3 female 29.69912     0     0   7.7500        Q
## 266        0      2   male 36.00000     0     0  10.5000        S
## 267        0      3   male 16.00000     4     1  39.6875        S
## 268        1      3   male 25.00000     1     0   7.7750        S
## 269        1      1 female 58.00000     0     1 153.4625        S
## 270        1      1 female 35.00000     0     0 135.6333        S
## 271        0      1   male 29.69912     0     0  31.0000        S
## 272        1      3   male 25.00000     0     0   0.0000        S
## 273        1      2 female 41.00000     0     1  19.5000        S
## 274        0      1   male 37.00000     0     1  29.7000        C
## 275        1      3 female 29.69912     0     0   7.7500        Q
## 276        1      1 female 63.00000     1     0  77.9583        S
## 277        0      3 female 45.00000     0     0   7.7500        S
## 278        0      2   male 29.69912     0     0   0.0000        S
## 279        0      3   male  7.00000     4     1  29.1250        Q
## 280        1      3 female 35.00000     1     1  20.2500        S
## 281        0      3   male 65.00000     0     0   7.7500        Q
## 282        0      3   male 28.00000     0     0   7.8542        S
## 283        0      3   male 16.00000     0     0   9.5000        S
```

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## 284        1      3   male 19.00000     0     0   8.0500        S
## 285        0      1   male 29.69912     0     0  26.0000        S
## 286        0      3   male 33.00000     0     0   8.6625        C
## 287        1      3   male 30.00000     0     0   9.5000        S
## 288        0      3   male 22.00000     0     0   7.8958        S
## 289        1      2   male 42.00000     0     0  13.0000        S
## 290        1      3 female 22.00000     0     0   7.7500        Q
## 291        1      1 female 26.00000     0     0  78.8500        S
## 292        1      1 female 19.00000     1     0  91.0792        C
## 293        0      2   male 36.00000     0     0  12.8750        C
## 294        0      3 female 24.00000     0     0   8.8500        S
## 295        0      3   male 24.00000     0     0   7.8958        S
## 296        0      1   male 29.69912     0     0  27.7208        C
## 297        0      3   male 23.50000     0     0   7.2292        C
## 298        0      1 female  2.00000     1     2 151.5500        S
## 299        1      1   male 29.69912     0     0  30.5000        S
## 300        1      1 female 50.00000     0     1 247.5208        C
## 301        1      3 female 29.69912     0     0   7.7500        Q
## 302        1      3   male 29.69912     2     0  23.2500        Q
## 303        0      3   male 19.00000     0     0   0.0000        S
## 304        1      2 female 29.69912     0     0  12.3500        Q
## 305        0      3   male 29.69912     0     0   8.0500        S
## 306        1      1   male  0.92000     1     2 151.5500        S
## 307        1      1 female 29.69912     0     0 110.8833        C
## 308        1      1 female 17.00000     1     0 108.9000        C
## 309        0      2   male 30.00000     1     0  24.0000        C
## 310        1      1 female 30.00000     0     0  56.9292        C
## 311        1      1 female 24.00000     0     0  83.1583        C
## 312        1      1 female 18.00000     2     2 262.3750        C
## 313        0      2 female 26.00000     1     1  26.0000        S
## 314        0      3   male 28.00000     0     0   7.8958        S
## 315        0      2   male 43.00000     1     1  26.2500        S
## 316        1      3 female 26.00000     0     0   7.8542        S
## 317        1      2 female 24.00000     1     0  26.0000        S
## 318        0      2   male 54.00000     0     0  14.0000        S
## 319        1      1 female 31.00000     0     2 164.8667        S
## 320        1      1 female 40.00000     1     1 134.5000        C
## 321        0      3   male 22.00000     0     0   7.2500        S
## 322        0      3   male 27.00000     0     0   7.8958        S
## 323        1      2 female 30.00000     0     0  12.3500        Q
## 324        1      2 female 22.00000     1     1  29.0000        S
## 325        0      3   male 29.69912     8     2  69.5500        S
## 326        1      1 female 36.00000     0     0 135.6333        C
## 327        0      3   male 61.00000     0     0   6.2375        S
## 328        1      2 female 36.00000     0     0  13.0000        S
## 329        1      3 female 31.00000     1     1  20.5250        S
## 330        1      1 female 16.00000     0     1  57.9792        C
## 331        1      3 female 29.69912     2     0  23.2500        Q
## 332        0      1   male 45.50000     0     0  28.5000        S
## 333        0      1   male 38.00000     0     1 153.4625        S
## 334        0      3   male 16.00000     2     0  18.0000        S
## 335        1      1 female 29.69912     1     0 133.6500        S
## 336        0      3   male 29.69912     0     0   7.8958        S
## 337        0      1   male 29.00000     1     0  66.6000        S
```

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## 338        1      1 female 41.00000     0     0 134.5000        C
## 339        1      3   male 45.00000     0     0   8.0500        S
## 340        0      1   male 45.00000     0     0  35.5000        S
## 341        1      2   male  2.00000     1     1  26.0000        S
## 342        1      1 female 24.00000     3     2 263.0000        S
## 343        0      2   male 28.00000     0     0  13.0000        S
## 344        0      2   male 25.00000     0     0  13.0000        S
## 345        0      2   male 36.00000     0     0  13.0000        S
## 346        1      2 female 24.00000     0     0  13.0000        S
## 347        1      2 female 40.00000     0     0  13.0000        S
## 348        1      3 female 29.69912     1     0  16.1000        S
## 349        1      3   male  3.00000     1     1  15.9000        S
## 350        0      3   male 42.00000     0     0   8.6625        S
## 351        0      3   male 23.00000     0     0   9.2250        S
## 352        0      1   male 29.69912     0     0  35.0000        S
## 353        0      3   male 15.00000     1     1   7.2292        C
## 354        0      3   male 25.00000     1     0  17.8000        S
## 355        0      3   male 29.69912     0     0   7.2250        C
## 356        0      3   male 28.00000     0     0   9.5000        S
## 357        1      1 female 22.00000     0     1  55.0000        S
## 358        0      2 female 38.00000     0     0  13.0000        S
## 359        1      3 female 29.69912     0     0   7.8792        Q
## 360        1      3 female 29.69912     0     0   7.8792        Q
## 361        0      3   male 40.00000     1     4  27.9000        S
## 362        0      2   male 29.00000     1     0  27.7208        C
## 363        0      3 female 45.00000     0     1  14.4542        C
## 364        0      3   male 35.00000     0     0   7.0500        S
## 365        0      3   male 29.69912     1     0  15.5000        Q
## 366        0      3   male 30.00000     0     0   7.2500        S
## 367        1      1 female 60.00000     1     0  75.2500        C
## 368        1      3 female 29.69912     0     0   7.2292        C
## 369        1      3 female 29.69912     0     0   7.7500        Q
## 370        1      1 female 24.00000     0     0  69.3000        C
## 371        1      1   male 25.00000     1     0  55.4417        C
## 372        0      3   male 18.00000     1     0   6.4958        S
## 373        0      3   male 19.00000     0     0   8.0500        S
## 374        0      1   male 22.00000     0     0 135.6333        C
## 375        0      3 female  3.00000     3     1  21.0750        S
## 376        1      1 female 29.69912     1     0  82.1708        C
## 377        1      3 female 22.00000     0     0   7.2500        S
## 378        0      1   male 27.00000     0     2 211.5000        C
## 379        0      3   male 20.00000     0     0   4.0125        C
## 380        0      3   male 19.00000     0     0   7.7750        S
## 381        1      1 female 42.00000     0     0 227.5250        C
## 382        1      3 female  1.00000     0     2  15.7417        C
## 383        0      3   male 32.00000     0     0   7.9250        S
## 384        1      1 female 35.00000     1     0  52.0000        S
## 385        0      3   male 29.69912     0     0   7.8958        S
## 386        0      2   male 18.00000     0     0  73.5000        S
## 387        0      3   male  1.00000     5     2  46.9000        S
## 388        1      2 female 36.00000     0     0  13.0000        S
## 389        0      3   male 29.69912     0     0   7.7292        Q
## 390        1      2 female 17.00000     0     0  12.0000        C
## 391        1      1   male 36.00000     1     2 120.0000        S
```

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## 392        1      3   male 21.00000     0     0   7.7958        S
## 393        0      3   male 28.00000     2     0   7.9250        S
## 394        1      1 female 23.00000     1     0 113.2750        C
## 395        1      3 female 24.00000     0     2  16.7000        S
## 396        0      3   male 22.00000     0     0   7.7958        S
## 397        0      3 female 31.00000     0     0   7.8542        S
## 398        0      2   male 46.00000     0     0  26.0000        S
## 399        0      2   male 23.00000     0     0  10.5000        S
## 400        1      2 female 28.00000     0     0  12.6500        S
## 401        1      3   male 39.00000     0     0   7.9250        S
## 402        0      3   male 26.00000     0     0   8.0500        S
## 403        0      3 female 21.00000     1     0   9.8250        S
## 404        0      3   male 28.00000     1     0  15.8500        S
## 405        0      3 female 20.00000     0     0   8.6625        S
## 406        0      2   male 34.00000     1     0  21.0000        S
## 407        0      3   male 51.00000     0     0   7.7500        S
## 408        1      2   male  3.00000     1     1  18.7500        S
## 409        0      3   male 21.00000     0     0   7.7750        S
## 410        0      3 female 29.69912     3     1  25.4667        S
## 411        0      3   male 29.69912     0     0   7.8958        S
## 412        0      3   male 29.69912     0     0   6.8583        Q
## 413        1      1 female 33.00000     1     0  90.0000        Q
## 414        0      2   male 29.69912     0     0   0.0000        S
## 415        1      3   male 44.00000     0     0   7.9250        S
## 416        0      3 female 29.69912     0     0   8.0500        S
## 417        1      2 female 34.00000     1     1  32.5000        S
## 418        1      2 female 18.00000     0     2  13.0000        S
## 419        0      2   male 30.00000     0     0  13.0000        S
## 420        0      3 female 10.00000     0     2  24.1500        S
## 421        0      3   male 29.69912     0     0   7.8958        C
## 422        0      3   male 21.00000     0     0   7.7333        Q
## 423        0      3   male 29.00000     0     0   7.8750        S
## 424        0      3 female 28.00000     1     1  14.4000        S
## 425        0      3   male 18.00000     1     1  20.2125        S
## 426        0      3   male 29.69912     0     0   7.2500        S
## 427        1      2 female 28.00000     1     0  26.0000        S
## 428        1      2 female 19.00000     0     0  26.0000        S
## 429        0      3   male 29.69912     0     0   7.7500        Q
## 430        1      3   male 32.00000     0     0   8.0500        S
## 431        1      1   male 28.00000     0     0  26.5500        S
## 432        1      3 female 29.69912     1     0  16.1000        S
## 433        1      2 female 42.00000     1     0  26.0000        S
## 434        0      3   male 17.00000     0     0   7.1250        S
## 435        0      1   male 50.00000     1     0  55.9000        S
## 436        1      1 female 14.00000     1     2 120.0000        S
## 437        0      3 female 21.00000     2     2  34.3750        S
## 438        1      2 female 24.00000     2     3  18.7500        S
## 439        0      1   male 64.00000     1     4 263.0000        S
## 440        0      2   male 31.00000     0     0  10.5000        S
## 441        1      2 female 45.00000     1     1  26.2500        S
## 442        0      3   male 20.00000     0     0   9.5000        S
## 443        0      3   male 25.00000     1     0   7.7750        S
## 444        1      2 female 28.00000     0     0  13.0000        S
## 445        1      3   male 29.69912     0     0   8.1125        S
```

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## 446        1       1   male  4.00000     0     2  81.8583         S
## 447        1       2 female 13.00000     0     1  19.5000         S
## 448        1       1   male 34.00000     0     0  26.5500         S
## 449        1       3 female  5.00000     2     1  19.2583         C
## 450        1       1   male 52.00000     0     0  30.5000         S
## 451        0       2   male 36.00000     1     2  27.7500         S
## 452        0       3   male 29.69912     1     0  19.9667         S
## 453        0       1   male 30.00000     0     0  27.7500         C
## 454        1       1   male 49.00000     1     0  89.1042         C
## 455        0       3   male 29.69912     0     0   8.0500         S
## 456        1       3   male 29.00000     0     0   7.8958         C
## 457        0       1   male 65.00000     0     0  26.5500         S
## 458        1       1 female 29.69912     1     0  51.8625         S
## 459        1       2 female 50.00000     0     0  10.5000         S
## 460        0       3   male 29.69912     0     0   7.7500         Q
## 461        1       1   male 48.00000     0     0  26.5500         S
## 462        0       3   male 34.00000     0     0   8.0500         S
## 463        0       1   male 47.00000     0     0  38.5000         S
## 464        0       2   male 48.00000     0     0  13.0000         S
## 465        0       3   male 29.69912     0     0   8.0500         S
## 466        0       3   male 38.00000     0     0   7.0500         S
## 467        0       2   male 29.69912     0     0   0.0000         S
## 468        0       1   male 56.00000     0     0  26.5500         S
## 469        0       3   male 29.69912     0     0   7.7250         Q
## 470        1       3 female  0.75000     2     1  19.2583         C
## 471        0       3   male 29.69912     0     0   7.2500         S
## 472        0       3   male 38.00000     0     0   8.6625         S
## 473        1       2 female 33.00000     1     2  27.7500         S
## 474        1       2 female 23.00000     0     0  13.7917         C
## 475        0       3 female 22.00000     0     0   9.8375         S
## 476        0       1   male 29.69912     0     0  52.0000         S
## 477        0       2   male 34.00000     1     0  21.0000         S
## 478        0       3   male 29.00000     1     0   7.0458         S
## 479        0       3   male 22.00000     0     0   7.5208         S
## 480        1       3 female  2.00000     0     1  12.2875         S
## 481        0       3   male  9.00000     5     2  46.9000         S
## 482        0       2   male 29.69912     0     0   0.0000         S
## 483        0       3   male 50.00000     0     0   8.0500         S
## 484        1       3 female 63.00000     0     0   9.5875         S
## 485        1       1   male 25.00000     1     0  91.0792         C
## 486        0       3 female 29.69912     3     1  25.4667         S
## 487        1       1 female 35.00000     1     0  90.0000         S
## 488        0       1   male 58.00000     0     0  29.7000         C
## 489        0       3   male 30.00000     0     0   8.0500         S
## 490        1       3   male  9.00000     1     1  15.9000         S
## 491        0       3   male 29.69912     1     0  19.9667         S
## 492        0       3   male 21.00000     0     0   7.2500         S
## 493        0       1   male 55.00000     0     0  30.5000         S
## 494        0       1   male 71.00000     0     0  49.5042         C
## 495        0       3   male 21.00000     0     0   8.0500         S
## 496        0       3   male 29.69912     0     0  14.4583         C
## 497        1       1 female 54.00000     1     0  78.2667         C
## 498        0       3   male 29.69912     0     0  15.1000         S
## 499        0       1 female 25.00000     1     2 151.5500         S
```

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## 500        0      3   male 24.00000     0     0   7.7958         S
## 501        0      3   male 17.00000     0     0   8.6625         S
## 502        0      3 female 21.00000     0     0   7.7500         Q
## 503        0      3 female 29.69912     0     0   7.6292         Q
## 504        0      3 female 37.00000     0     0   9.5875         S
## 505        1      1 female 16.00000     0     0  86.5000         S
## 506        0      1   male 18.00000     1     0 108.9000         C
## 507        1      2 female 33.00000     0     2  26.0000         S
## 508        1      1   male 29.69912     0     0  26.5500         S
## 509        0      3   male 28.00000     0     0  22.5250         S
## 510        1      3   male 26.00000     0     0  56.4958         S
## 511        1      3   male 29.00000     0     0   7.7500         Q
## 512        0      3   male 29.69912     0     0   8.0500         S
## 513        1      1   male 36.00000     0     0  26.2875         S
## 514        1      1 female 54.00000     1     0  59.4000         C
## 515        0      3   male 24.00000     0     0   7.4958         S
## 516        0      1   male 47.00000     0     0  34.0208         S
## 517        1      2 female 34.00000     0     0  10.5000         S
## 518        0      3   male 29.69912     0     0  24.1500         Q
## 519        1      2 female 36.00000     1     0  26.0000         S
## 520        0      3   male 32.00000     0     0   7.8958         S
## 521        1      1 female 30.00000     0     0  93.5000         S
## 522        0      3   male 22.00000     0     0   7.8958         S
## 523        0      3   male 29.69912     0     0   7.2250         C
## 524        1      1 female 44.00000     0     1  57.9792         C
## 525        0      3   male 29.69912     0     0   7.2292         C
## 526        0      3   male 40.50000     0     0   7.7500         Q
## 527        1      2 female 50.00000     0     0  10.5000         S
## 528        0      1   male 29.69912     0     0 221.7792         S
## 529        0      3   male 39.00000     0     0   7.9250         S
## 530        0      2   male 23.00000     2     1  11.5000         S
## 531        1      2 female  2.00000     1     1  26.0000         S
## 532        0      3   male 29.69912     0     0   7.2292         C
## 533        0      3   male 17.00000     1     1   7.2292         C
## 534        1      3 female 29.69912     0     2  22.3583         C
## 535        0      3 female 30.00000     0     0   8.6625         S
## 536        1      2 female  7.00000     0     2  26.2500         S
## 537        0      1   male 45.00000     0     0  26.5500         S
## 538        1      1 female 30.00000     0     0 106.4250         C
## 539        0      3   male 29.69912     0     0  14.5000         S
## 540        1      1 female 22.00000     0     2  49.5000         C
## 541        1      1 female 36.00000     0     2  71.0000         S
## 542        0      3 female  9.00000     4     2  31.2750         S
## 543        0      3 female 11.00000     4     2  31.2750         S
## 544        1      2   male 32.00000     1     0  26.0000         S
## 545        0      1   male 50.00000     1     0 106.4250         C
## 546        0      1   male 64.00000     0     0  26.0000         S
## 547        1      2 female 19.00000     1     0  26.0000         S
## 548        1      2   male 29.69912     0     0  13.8625         C
## 549        0      3   male 33.00000     1     1  20.5250         S
## 550        1      2   male  8.00000     1     1  36.7500         S
## 551        1      1   male 17.00000     0     2 110.8833         C
## 552        0      2   male 27.00000     0     0  26.0000         S
## 553        0      3   male 29.69912     0     0   7.8292         Q
```

```
## 554        1       3   male 22.00000     0     0   7.2250         C
## 555        1       3 female 22.00000     0     0   7.7750         S
## 556        0       1   male 62.00000     0     0  26.5500         S
## 557        1       1 female 48.00000     1     0  39.6000         C
## 558        0       1   male 29.69912     0     0 227.5250         C
## 559        1       1 female 39.00000     1     1  79.6500         S
## 560        1       3 female 36.00000     1     0  17.4000         S
## 561        0       3   male 29.69912     0     0   7.7500         Q
## 562        0       3   male 40.00000     0     0   7.8958         S
## 563        0       2   male 28.00000     0     0  13.5000         S
## 564        0       3   male 29.69912     0     0   8.0500         S
## 565        0       3 female 29.69912     0     0   8.0500         S
## 566        0       3   male 24.00000     2     0  24.1500         S
## 567        0       3   male 19.00000     0     0   7.8958         S
## 568        0       3 female 29.00000     0     4  21.0750         S
## 569        0       3   male 29.69912     0     0   7.2292         C
## 570        1       3   male 32.00000     0     0   7.8542         S
## 571        1       2   male 62.00000     0     0  10.5000         S
## 572        1       1 female 53.00000     2     0  51.4792         S
## 573        1       1   male 36.00000     0     0  26.3875         S
## 574        1       3 female 29.69912     0     0   7.7500         Q
## 575        0       3   male 16.00000     0     0   8.0500         S
## 576        0       3   male 19.00000     0     0  14.5000         S
## 577        1       2 female 34.00000     0     0  13.0000         S
## 578        1       1 female 39.00000     1     0  55.9000         S
## 579        0       3 female 29.69912     1     0  14.4583         C
## 580        1       3   male 32.00000     0     0   7.9250         S
## 581        1       2 female 25.00000     1     1  30.0000         S
## 582        1       1 female 39.00000     1     1 110.8833         C
## 583        0       2   male 54.00000     0     0  26.0000         S
## 584        0       1   male 36.00000     0     0  40.1250         C
## 585        0       3   male 29.69912     0     0   8.7125         C
## 586        1       1 female 18.00000     0     2  79.6500         S
## 587        0       2   male 47.00000     0     0  15.0000         S
## 588        1       1   male 60.00000     1     1  79.2000         C
## 589        0       3   male 22.00000     0     0   8.0500         S
## 590        0       3   male 29.69912     0     0   8.0500         S
## 591        0       3   male 35.00000     0     0   7.1250         S
## 592        1       1 female 52.00000     1     0  78.2667         C
## 593        0       3   male 47.00000     0     0   7.2500         S
## 594        0       3 female 29.69912     0     2   7.7500         Q
## 595        0       2   male 37.00000     1     0  26.0000         S
## 596        0       3   male 36.00000     1     1  24.1500         S
## 597        1       2 female 29.69912     0     0  33.0000         S
## 598        0       3   male 49.00000     0     0   0.0000         S
## 599        0       3   male 29.69912     0     0   7.2250         C
## 600        1       1   male 49.00000     1     0  56.9292         C
## 601        1       2 female 24.00000     2     1  27.0000         S
## 602        0       3   male 29.69912     0     0   7.8958         S
## 603        0       1   male 29.69912     0     0  42.4000         S
## 604        0       3   male 44.00000     0     0   8.0500         S
## 605        1       1   male 35.00000     0     0  26.5500         C
## 606        0       3   male 36.00000     1     0  15.5500         S
## 607        0       3   male 30.00000     0     0   7.8958         S
```

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## 608        1      1   male 27.00000     0     0  30.5000         S
## 609        1      2 female 22.00000     1     2  41.5792         C
## 610        1      1 female 40.00000     0     0 153.4625         S
## 611        0      3 female 39.00000     1     5  31.2750         S
## 612        0      3   male 29.69912     0     0   7.0500         S
## 613        1      3 female 29.69912     1     0  15.5000         Q
## 614        0      3   male 29.69912     0     0   7.7500         Q
## 615        0      3   male 35.00000     0     0   8.0500         S
## 616        1      2 female 24.00000     1     2  65.0000         S
## 617        0      3   male 34.00000     1     1  14.4000         S
## 618        0      3 female 26.00000     1     0  16.1000         S
## 619        1      2 female  4.00000     2     1  39.0000         S
## 620        0      2   male 26.00000     0     0  10.5000         S
## 621        0      3   male 27.00000     1     0  14.4542         C
## 622        1      1   male 42.00000     1     0  52.5542         S
## 623        1      3   male 20.00000     1     1  15.7417         C
## 624        0      3   male 21.00000     0     0   7.8542         S
## 625        0      3   male 21.00000     0     0  16.1000         S
## 626        0      1   male 61.00000     0     0  32.3208         S
## 627        0      2   male 57.00000     0     0  12.3500         Q
## 628        1      1 female 21.00000     0     0  77.9583         S
## 629        0      3   male 26.00000     0     0   7.8958         S
## 630        0      3   male 29.69912     0     0   7.7333         Q
## 631        1      1   male 80.00000     0     0  30.0000         S
## 632        0      3   male 51.00000     0     0   7.0542         S
## 633        1      1   male 32.00000     0     0  30.5000         C
## 634        0      1   male 29.69912     0     0   0.0000         S
## 635        0      3 female  9.00000     3     2  27.9000         S
## 636        1      2 female 28.00000     0     0  13.0000         S
## 637        0      3   male 32.00000     0     0   7.9250         S
## 638        0      2   male 31.00000     1     1  26.2500         S
## 639        0      3 female 41.00000     0     5  39.6875         S
## 640        0      3   male 29.69912     1     0  16.1000         S
## 641        0      3   male 20.00000     0     0   7.8542         S
## 642        1      1 female 24.00000     0     0  69.3000         C
## 643        0      3 female  2.00000     3     2  27.9000         S
## 644        1      3   male 29.69912     0     0  56.4958         S
## 645        1      3 female  0.75000     2     1  19.2583         C
## 646        1      1   male 48.00000     1     0  76.7292         C
## 647        0      3   male 19.00000     0     0   7.8958         S
## 648        1      1   male 56.00000     0     0  35.5000         C
## 649        0      3   male 29.69912     0     0   7.5500         S
## 650        1      3 female 23.00000     0     0   7.5500         S
## 651        0      3   male 29.69912     0     0   7.8958         S
## 652        1      2 female 18.00000     0     1  23.0000         S
## 653        0      3   male 21.00000     0     0   8.4333         S
## 654        1      3 female 29.69912     0     0   7.8292         Q
## 655        0      3 female 18.00000     0     0   6.7500         Q
## 656        0      2   male 24.00000     2     0  73.5000         S
## 657        0      3   male 29.69912     0     0   7.8958         S
## 658        0      3 female 32.00000     1     1  15.5000         Q
## 659        0      2   male 23.00000     0     0  13.0000         S
## 660        0      1   male 58.00000     0     2 113.2750         C
## 661        1      1   male 50.00000     2     0 133.6500         S
```

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## 662        0      3   male 40.00000     0     0   7.2250        C
## 663        0      1   male 47.00000     0     0  25.5875        S
## 664        0      3   male 36.00000     0     0   7.4958        S
## 665        1      3   male 20.00000     1     0   7.9250        S
## 666        0      2   male 32.00000     2     0  73.5000        S
## 667        0      2   male 25.00000     0     0  13.0000        S
## 668        0      3   male 29.69912     0     0   7.7750        S
## 669        0      3   male 43.00000     0     0   8.0500        S
## 670        1      1 female 29.69912     1     0  52.0000        S
## 671        1      2 female 40.00000     1     1  39.0000        S
## 672        0      1   male 31.00000     1     0  52.0000        S
## 673        0      2   male 70.00000     0     0  10.5000        S
## 674        1      2   male 31.00000     0     0  13.0000        S
## 675        0      2   male 29.69912     0     0   0.0000        S
## 676        0      3   male 18.00000     0     0   7.7750        S
## 677        0      3   male 24.50000     0     0   8.0500        S
## 678        1      3 female 18.00000     0     0   9.8417        S
## 679        0      3 female 43.00000     1     6  46.9000        S
## 680        1      1   male 36.00000     0     1 512.3292        C
## 681        0      3 female 29.69912     0     0   8.1375        Q
## 682        1      1   male 27.00000     0     0  76.7292        C
## 683        0      3   male 20.00000     0     0   9.2250        S
## 684        0      3   male 14.00000     5     2  46.9000        S
## 685        0      2   male 60.00000     1     1  39.0000        S
## 686        0      2   male 25.00000     1     2  41.5792        C
## 687        0      3   male 14.00000     4     1  39.6875        S
## 688        0      3   male 19.00000     0     0  10.1708        S
## 689        0      3   male 18.00000     0     0   7.7958        S
## 690        1      1 female 15.00000     0     1 211.3375        S
## 691        1      1   male 31.00000     1     0  57.0000        S
## 692        1      3 female  4.00000     0     1  13.4167        C
## 693        1      3   male 29.69912     0     0  56.4958        S
## 694        0      3   male 25.00000     0     0   7.2250        C
## 695        0      1   male 60.00000     0     0  26.5500        S
## 696        0      2   male 52.00000     0     0  13.5000        S
## 697        0      3   male 44.00000     0     0   8.0500        S
## 698        1      3 female 29.69912     0     0   7.7333        Q
## 699        0      1   male 49.00000     1     1 110.8833        C
## 700        0      3   male 42.00000     0     0   7.6500        S
## 701        1      1 female 18.00000     1     0 227.5250        C
## 702        1      1   male 35.00000     0     0  26.2875        S
## 703        0      3 female 18.00000     0     1  14.4542        C
## 704        0      3   male 25.00000     0     0   7.7417        Q
## 705        0      3   male 26.00000     1     0   7.8542        S
## 706        0      2   male 39.00000     0     0  26.0000        S
## 707        1      2 female 45.00000     0     0  13.5000        S
## 708        1      1   male 42.00000     0     0  26.2875        S
## 709        1      1 female 22.00000     0     0 151.5500        S
## 710        1      3   male 29.69912     1     1  15.2458        C
## 711        1      1 female 24.00000     0     0  49.5042        C
## 712        0      1   male 29.69912     0     0  26.5500        S
## 713        1      1   male 48.00000     1     0  52.0000        S
## 714        0      3   male 29.00000     0     0   9.4833        S
## 715        0      2   male 52.00000     0     0  13.0000        S
```

```
## 716        0      3   male 19.00000     0     0   7.6500         S
## 717        1      1 female 38.00000     0     0 227.5250         C
## 718        1      2 female 27.00000     0     0  10.5000         S
## 719        0      3   male 29.69912     0     0  15.5000         Q
## 720        0      3   male 33.00000     0     0   7.7750         S
## 721        1      2 female  6.00000     0     1  33.0000         S
## 722        0      3   male 17.00000     1     0   7.0542         S
## 723        0      2   male 34.00000     0     0  13.0000         S
## 724        0      2   male 50.00000     0     0  13.0000         S
## 725        1      1   male 27.00000     1     0  53.1000         S
## 726        0      3   male 20.00000     0     0   8.6625         S
## 727        1      2 female 30.00000     3     0  21.0000         S
## 728        1      3 female 29.69912     0     0   7.7375         Q
## 729        0      2   male 25.00000     1     0  26.0000         S
## 730        0      3 female 25.00000     1     0   7.9250         S
## 731        1      1 female 29.00000     0     0 211.3375         S
## 732        0      3   male 11.00000     0     0  18.7875         C
## 733        0      2   male 29.69912     0     0   0.0000         S
## 734        0      2   male 23.00000     0     0  13.0000         S
## 735        0      2   male 23.00000     0     0  13.0000         S
## 736        0      3   male 28.50000     0     0  16.1000         S
## 737        0      3 female 48.00000     1     3  34.3750         S
## 738        1      1   male 35.00000     0     0 512.3292         C
## 739        0      3   male 29.69912     0     0   7.8958         S
## 740        0      3   male 29.69912     0     0   7.8958         S
## 741        1      1   male 29.69912     0     0  30.0000         S
## 742        0      1   male 36.00000     1     0  78.8500         S
## 743        1      1 female 21.00000     2     2 262.3750         C
## 744        0      3   male 24.00000     1     0  16.1000         S
## 745        1      3   male 31.00000     0     0   7.9250         S
## 746        0      1   male 70.00000     1     1  71.0000         S
## 747        0      3   male 16.00000     1     1  20.2500         S
## 748        1      2 female 30.00000     0     0  13.0000         S
## 749        0      1   male 19.00000     1     0  53.1000         S
## 750        0      3   male 31.00000     0     0   7.7500         Q
## 751        1      2 female  4.00000     1     1  23.0000         S
## 752        1      3   male  6.00000     0     1  12.4750         S
## 753        0      3   male 33.00000     0     0   9.5000         S
## 754        0      3   male 23.00000     0     0   7.8958         S
## 755        1      2 female 48.00000     1     2  65.0000         S
## 756        1      2   male  0.67000     1     1  14.5000         S
## 757        0      3   male 28.00000     0     0   7.7958         S
## 758        0      2   male 18.00000     0     0  11.5000         S
## 759        0      3   male 34.00000     0     0   8.0500         S
## 760        1      1 female 33.00000     0     0  86.5000         S
## 761        0      3   male 29.69912     0     0  14.5000         S
## 762        0      3   male 41.00000     0     0   7.1250         S
## 763        1      3   male 20.00000     0     0   7.2292         C
## 764        1      1 female 36.00000     1     2 120.0000         S
## 765        0      3   male 16.00000     0     0   7.7750         S
## 766        1      1 female 51.00000     1     0  77.9583         S
## 767        0      1   male 29.69912     0     0  39.6000         C
## 768        0      3 female 30.50000     0     0   7.7500         Q
## 769        0      3   male 29.69912     1     0  24.1500         Q
```

```
## 770        0      3   male 32.00000     0     0   8.3625         S
## 771        0      3   male 24.00000     0     0   9.5000         S
## 772        0      3   male 48.00000     0     0   7.8542         S
## 773        0      2 female 57.00000     0     0  10.5000         S
## 774        0      3   male 29.69912     0     0   7.2250         C
## 775        1      2 female 54.00000     1     3  23.0000         S
## 776        0      3   male 18.00000     0     0   7.7500         S
## 777        0      3   male 29.69912     0     0   7.7500         Q
## 778        1      3 female  5.00000     0     0  12.4750         S
## 779        0      3   male 29.69912     0     0   7.7375         Q
## 780        1      1 female 43.00000     0     1 211.3375         S
## 781        1      3 female 13.00000     0     0   7.2292         C
## 782        1      1 female 17.00000     1     0  57.0000         S
## 783        0      1   male 29.00000     0     0  30.0000         S
## 784        0      3   male 29.69912     1     2  23.4500         S
## 785        0      3   male 25.00000     0     0   7.0500         S
## 786        0      3   male 25.00000     0     0   7.2500         S
## 787        1      3 female 18.00000     0     0   7.4958         S
## 788        0      3   male  8.00000     4     1  29.1250         Q
## 789        1      3   male  1.00000     1     2  20.5750         S
## 790        0      1   male 46.00000     0     0  79.2000         C
## 791        0      3   male 29.69912     0     0   7.7500         Q
## 792        0      2   male 16.00000     0     0  26.0000         S
## 793        0      3 female 29.69912     8     2  69.5500         S
## 794        0      1   male 29.69912     0     0  30.6958         C
## 795        0      3   male 25.00000     0     0   7.8958         S
## 796        0      2   male 39.00000     0     0  13.0000         S
## 797        1      1 female 49.00000     0     0  25.9292         S
## 798        1      3 female 31.00000     0     0   8.6833         S
## 799        0      3   male 30.00000     0     0   7.2292         C
## 800        0      3 female 30.00000     1     1  24.1500         S
## 801        0      2   male 34.00000     0     0  13.0000         S
## 802        1      2 female 31.00000     1     1  26.2500         S
## 803        1      1   male 11.00000     1     2 120.0000         S
## 804        1      3   male  0.42000     0     1   8.5167         C
## 805        1      3   male 27.00000     0     0   6.9750         S
## 806        0      3   male 31.00000     0     0   7.7750         S
## 807        0      1   male 39.00000     0     0   0.0000         S
## 808        0      3 female 18.00000     0     0   7.7750         S
## 809        0      2   male 39.00000     0     0  13.0000         S
## 810        1      1 female 33.00000     1     0  53.1000         S
## 811        0      3   male 26.00000     0     0   7.8875         S
## 812        0      3   male 39.00000     0     0  24.1500         S
## 813        0      2   male 35.00000     0     0  10.5000         S
## 814        0      3 female  6.00000     4     2  31.2750         S
## 815        0      3   male 30.50000     0     0   8.0500         S
## 816        0      1   male 29.69912     0     0   0.0000         S
## 817        0      3 female 23.00000     0     0   7.9250         S
## 818        0      2   male 31.00000     1     1  37.0042         C
## 819        0      3   male 43.00000     0     0   6.4500         S
## 820        0      3   male 10.00000     3     2  27.9000         S
## 821        1      1 female 52.00000     1     1  93.5000         S
## 822        1      3   male 27.00000     0     0   8.6625         S
## 823        0      1   male 38.00000     0     0   0.0000         S
```

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## 824        1       3 female 27.00000     0     1  12.4750         S
## 825        0       3   male  2.00000     4     1  39.6875         S
## 826        0       3   male 29.69912     0     0   6.9500         Q
## 827        0       3   male 29.69912     0     0  56.4958         S
## 828        1       2   male  1.00000     0     2  37.0042         C
## 829        1       3   male 29.69912     0     0   7.7500         Q
## 830        1       1 female 62.00000     0     0  80.0000
## 831        1       3 female 15.00000     1     0  14.4542         C
## 832        1       2   male  0.83000     1     1  18.7500         S
## 833        0       3   male 29.69912     0     0   7.2292         C
## 834        0       3   male 23.00000     0     0   7.8542         S
## 835        0       3   male 18.00000     0     0   8.3000         S
## 836        1       1 female 39.00000     1     1  83.1583         C
## 837        0       3   male 21.00000     0     0   8.6625         S
## 838        0       3   male 29.69912     0     0   8.0500         S
## 839        1       3   male 32.00000     0     0  56.4958         S
## 840        1       1   male 29.69912     0     0  29.7000         C
## 841        0       3   male 20.00000     0     0   7.9250         S
## 842        0       2   male 16.00000     0     0  10.5000         S
## 843        1       1 female 30.00000     0     0  31.0000         C
## 844        0       3   male 34.50000     0     0   6.4375         C
## 845        0       3   male 17.00000     0     0   8.6625         S
## 846        0       3   male 42.00000     0     0   7.5500         S
## 847        0       3   male 29.69912     8     2  69.5500         S
## 848        0       3   male 35.00000     0     0   7.8958         C
## 849        0       2   male 28.00000     0     1  33.0000         S
## 850        1       1 female 29.69912     1     0  89.1042         C
## 851        0       3   male  4.00000     4     2  31.2750         S
## 852        0       3   male 74.00000     0     0   7.7750         S
## 853        0       3 female  9.00000     1     1  15.2458         C
## 854        1       1 female 16.00000     0     1  39.4000         S
## 855        0       2 female 44.00000     1     0  26.0000         S
## 856        1       3 female 18.00000     0     1   9.3500         S
## 857        1       1 female 45.00000     1     1 164.8667         S
## 858        1       1   male 51.00000     0     0  26.5500         S
## 859        1       3 female 24.00000     0     3  19.2583         C
## 860        0       3   male 29.69912     0     0   7.2292         C
## 861        0       3   male 41.00000     2     0  14.1083         S
## 862        0       2   male 21.00000     1     0  11.5000         S
## 863        1       1 female 48.00000     0     0  25.9292         S
## 864        0       3 female 29.69912     8     2  69.5500         S
## 865        0       2   male 24.00000     0     0  13.0000         S
## 866        1       2 female 42.00000     0     0  13.0000         S
## 867        1       2 female 27.00000     1     0  13.8583         C
## 868        0       1   male 31.00000     0     0  50.4958         S
## 869        0       3   male 29.69912     0     0   9.5000         S
## 870        1       3   male  4.00000     1     1  11.1333         S
## 871        0       3   male 26.00000     0     0   7.8958         S
## 872        1       1 female 47.00000     1     1  52.5542         S
## 873        0       1   male 33.00000     0     0   5.0000         S
## 874        0       3   male 47.00000     0     0   9.0000         S
## 875        1       2 female 28.00000     1     0  24.0000         C
## 876        1       3 female 15.00000     0     0   7.2250         C
## 877        0       3   male 20.00000     0     0   9.8458         S
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## 878        0      3   male 19.00000     0     0   7.8958        S
## 879        0      3   male 29.69912     0     0   7.8958        S
## 880        1      1 female 56.00000     0     1  83.1583        C
## 881        1      2 female 25.00000     0     1  26.0000        S
## 882        0      3   male 33.00000     0     0   7.8958        S
## 883        0      3 female 22.00000     0     0  10.5167        S
## 884        0      2   male 28.00000     0     0  10.5000        S
## 885        0      3   male 25.00000     0     0   7.0500        S
## 886        0      3 female 39.00000     0     5  29.1250        Q
## 887        0      2   male 27.00000     0     0  13.0000        S
## 888        1      1 female 19.00000     0     0  30.0000        S
## 889        0      3 female 29.69912     1     2  23.4500        S
## 890        1      1   male 26.00000     0     0  30.0000        C
## 891        0      3   male 32.00000     0     0   7.7500        Q
##            sfare     cfare cage
## 1   -0.502163137     Cheap    2
## 2    0.786403618 Expensive    3
## 3   -0.488579852     Cheap    2
## 4    0.420494070 Expensive    3
## 5   -0.486064428     Cheap    3
## 6   -0.477848050     Cheap    2
## 7    0.395591381 Expensive    5
## 8   -0.223957338     Cheap    0
## 9   -0.424017995     Cheap    2
## 10  -0.042931390     Cheap    1
## 11  -0.311997147     Cheap    0
## 12  -0.113781804     Cheap    5
## 13  -0.486064428     Cheap    2
## 14  -0.018698810     Cheap    3
## 15  -0.490004587     Cheap    1
## 16  -0.326083517     Cheap    5
## 17  -0.061964088     Cheap    0
## 18  -0.386453672     Cheap    2
## 19  -0.285836747     Cheap    3
## 20  -0.502666221     Cheap    2
## 21  -0.124849666     Cheap    3
## 22  -0.386453672     Cheap    3
## 23  -0.486482995     Cheap    1
## 24   0.066322492 Expensive    2
## 25  -0.223957338     Cheap    0
## 26  -0.016434929     Cheap    3
## 27  -0.502666221     Cheap    2
## 28   4.644392600 Expensive    1
## 29  -0.489501503     Cheap    2
## 30  -0.489167454     Cheap    2
## 31  -0.090221345     Cheap    4
## 32   2.300436803 Expensive    2
## 33  -0.492101444     Cheap    2
## 34  -0.436762135     Cheap    6
## 35   1.005496973 Expensive    2
## 36   0.398358346 Expensive    4
## 37  -0.502581703     Cheap    2
## 38  -0.486064428     Cheap    2
## 39  -0.285836747     Cheap    1
```

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## 40  -0.421836620     Cheap    1
## 41  -0.457388605     Cheap    4
## 42  -0.225466592     Cheap    2
## 43  -0.489167454     Cheap    2
## 44   0.188656575 Expensive    0
## 45  -0.489501503     Cheap    1
## 46  -0.486064428     Cheap    2
## 47  -0.336145210     Cheap    2
## 48  -0.492101444     Cheap    2
## 49  -0.211798788     Cheap    2
## 50  -0.289861424     Cheap    1
## 51   0.150589167 Expensive    0
## 52  -0.491095275     Cheap    2
## 53   0.895993561 Expensive    4
## 54  -0.124849666     Cheap    2
## 55   0.599173631 Expensive    6
## 56   0.066322492 Expensive    2
## 57  -0.436762135     Cheap    2
## 58  -0.502581703     Cheap    2
## 59  -0.089633742     Cheap    0
## 60   0.295729082 Expensive    1
## 61  -0.502581703     Cheap    2
## 62   0.961813129 Expensive    3
## 63   1.031741892 Expensive    4
## 64  -0.086615234     Cheap    0
## 65  -0.090221345     Cheap    2
## 66  -0.341260574     Cheap    2
## 67  -0.436762135     Cheap    2
## 68  -0.483885066     Cheap    1
## 69  -0.488579852     Cheap    1
## 70  -0.473738855     Cheap    2
## 71  -0.436762135     Cheap    3
## 72   0.295729082 Expensive    1
## 73   0.831011126 Expensive    2
## 74  -0.357190246     Cheap    2
## 75   0.488829061 Expensive    3
## 76  -0.494113782     Cheap    2
## 77  -0.489167454     Cheap    2
## 78  -0.486064428     Cheap    2
## 79  -0.064479511     Cheap    0
## 80  -0.397018449     Cheap    3
## 81  -0.466947213     Cheap    2
## 82  -0.456885520     Cheap    2
## 83  -0.491346817     Cheap    2
## 84   0.299753759 Expensive    2
## 85  -0.436762135     Cheap    1
## 86  -0.329102025     Cheap    3
## 87   0.043683684 Expensive    1
## 88  -0.486064428     Cheap    2
## 89   4.644392600 Expensive    2
## 90  -0.486064428     Cheap    2
## 91  -0.486064428     Cheap    2
## 92  -0.490004587     Cheap    2
## 93   0.582990404 Expensive    4
```

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## 94  -0.234019030     Cheap    2
## 95  -0.502163137     Cheap    5
## 96  -0.486064428     Cheap    2
## 97   0.049302133 Expensive    7
## 98   0.626925791 Expensive    2
## 99  -0.185219821     Cheap    3
## 100 -0.124849666     Cheap    3
## 101 -0.489167454     Cheap    2
## 102 -0.489167454     Cheap    2
## 103  0.907228447 Expensive    2
## 104 -0.473905879     Cheap    3
## 105 -0.488579852     Cheap    3
## 106 -0.489167454     Cheap    2
## 107 -0.494113782     Cheap    2
## 108 -0.491598359     Cheap    2
## 109 -0.489167454     Cheap    3
## 110 -0.162077929     Cheap    2
## 111  0.398358346 Expensive    4
## 112 -0.357190246     Cheap    1
## 113 -0.486064428     Cheap    2
## 114 -0.450345420     Cheap    2
## 115 -0.357107740     Cheap    1
## 116 -0.488579852     Cheap    2
## 117 -0.492101444     Cheap    7
## 118 -0.225466592     Cheap    2
## 119  4.332898697 Expensive    2
## 120 -0.018698810     Cheap    0
## 121  0.831011126 Expensive    2
## 122 -0.486064428     Cheap    2
## 123 -0.042931390     Cheap    3
## 124 -0.386453672     Cheap    3
## 125  0.907228447 Expensive    5
## 126 -0.421836620     Cheap    1
## 127 -0.492101444     Cheap    2
## 128 -0.504342499     Cheap    2
## 129 -0.198132998     Cheap    2
## 130 -0.507697067     Cheap    4
## 131 -0.489167454     Cheap    3
## 132 -0.506187814     Cheap    2
## 133 -0.356268595     Cheap    4
## 134 -0.124849666     Cheap    2
## 135 -0.386453672     Cheap    2
## 136 -0.345285251     Cheap    2
## 137 -0.119148711     Cheap    1
## 138  0.420494070 Expensive    3
## 139 -0.462586475     Cheap    1
## 140  0.945714421 Expensive    2
## 141 -0.341260574     Cheap    2
## 142 -0.492101444     Cheap    2
## 143 -0.329102025     Cheap    2
## 144 -0.512224829     Cheap    1
## 145 -0.416638750     Cheap    1
## 146  0.091476724 Expensive    1
## 147 -0.491179793     Cheap    2
```

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## 148  0.043683684 Expensive    0
## 149 -0.124849666     Cheap    3
## 150 -0.386453672     Cheap    4
## 151 -0.396012280     Cheap    5
## 152  0.692159768 Expensive    2
## 153 -0.486064428     Cheap    5
## 154 -0.356268595     Cheap    4
## 155 -0.500905425     Cheap    2
## 156  0.587099600 Expensive    5
## 157 -0.492437505     Cheap    1
## 158 -0.486064428     Cheap    3
## 159 -0.473738855     Cheap    2
## 160  0.751523754 Expensive    2
## 161 -0.324071178     Cheap    4
## 162 -0.331114363     Cheap    4
## 163 -0.491598359     Cheap    2
## 164 -0.473738855     Cheap    1
## 165  0.150589167 Expensive    0
## 166 -0.235025199     Cheap    0
## 167  0.458728501 Expensive    2
## 168 -0.086615234     Cheap    4
## 169 -0.126358920     Cheap    2
## 170  0.488829061 Expensive    2
## 171  0.026075722 Expensive    6
## 172 -0.061964088     Cheap    0
## 173 -0.424017995     Cheap    0
## 174 -0.488579852     Cheap    2
## 175 -0.030354274     Cheap    5
## 176 -0.490004587     Cheap    1
## 177 -0.135581467     Cheap    2
## 178 -0.070264984     Cheap    5
## 179 -0.386453672     Cheap    3
## 180 -0.648057678     Cheap    3
## 181  0.751523754 Expensive    2
## 182 -0.345200733     Cheap    2
## 183 -0.016434929     Cheap    0
## 184  0.136754340 Expensive    0
## 185 -0.204840122     Cheap    0
## 186  0.358111576 Expensive    2
## 187 -0.336145210     Cheap    2
## 188 -0.113781804     Cheap    4
## 189 -0.336145210     Cheap    4
## 190 -0.489167454     Cheap    3
## 191 -0.386453672     Cheap    3
## 192 -0.386453672     Cheap    1
## 193 -0.490004587     Cheap    1
## 194 -0.124849666     Cheap    0
## 195 -0.090221345     Cheap    4
## 196  2.300436803 Expensive    5
## 197 -0.492101444     Cheap    2
## 198 -0.478936725     Cheap    4
## 199 -0.492101444     Cheap    2
## 200 -0.386453672     Cheap    2
## 201 -0.456885520     Cheap    2
```

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## 202  0.751523754 Expensive    2
## 203 -0.517340194     Cheap    3
## 204 -0.502666221     Cheap    4
## 205 -0.486064428     Cheap    1
## 206 -0.437516762     Cheap    0
## 207 -0.329102025     Cheap    3
## 208 -0.269989581     Cheap    2
## 209 -0.492101444     Cheap    1
## 210 -0.024232741     Cheap    4
## 211 -0.506187814     Cheap    2
## 212 -0.225466592     Cheap    3
## 213 -0.502163137     Cheap    2
## 214 -0.386453672     Cheap    3
## 215 -0.492101444     Cheap    2
## 216  1.631418767 Expensive    3
## 217 -0.488579852     Cheap    2
## 218 -0.104726281     Cheap    4
## 219  0.887189580 Expensive    3
## 220 -0.436762135     Cheap    3
## 221 -0.486064428     Cheap    1
## 222 -0.386453672     Cheap    2
## 223 -0.486064428     Cheap    5
## 224 -0.489167454     Cheap    2
## 225  1.163046980 Expensive    3
## 226 -0.459904028     Cheap    2
## 227 -0.436762135     Cheap    1
## 228 -0.502163137     Cheap    2
## 229 -0.386453672     Cheap    1
## 230 -0.135581467     Cheap    2
## 231  1.031741892 Expensive    3
## 232 -0.491598359     Cheap    2
## 233 -0.376391980     Cheap    5
## 234 -0.016434929     Cheap    0
## 235 -0.436762135     Cheap    2
## 236 -0.496126121     Cheap    2
## 237 -0.124849666     Cheap    4
## 238 -0.119818820     Cheap    0
## 239 -0.436762135     Cheap    1
## 240 -0.401043126     Cheap    3
## 241 -0.357190246     Cheap    2
## 242 -0.336145210     Cheap    2
## 243 -0.436762135     Cheap    2
## 244 -0.504678560     Cheap    2
## 245 -0.502666221     Cheap    3
## 246  1.163046980 Expensive    4
## 247 -0.491598359     Cheap    2
## 248 -0.356268595     Cheap    2
## 249  0.409510726 Expensive    3
## 250 -0.124849666     Cheap    5
## 251 -0.502163137     Cheap    2
## 252 -0.437516762     Cheap    2
## 253 -0.113781804     Cheap    6
## 254 -0.324071178     Cheap    3
## 255 -0.241313757     Cheap    4
```

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## 256 -0.341260574     Cheap    2
## 257  0.945714421 Expensive    2
## 258  1.092615132 Expensive    3
## 259  9.661740105 Expensive    3
## 260 -0.124849666     Cheap    5
## 261 -0.492101444     Cheap    2
## 262 -0.016434929     Cheap    0
## 263  0.954769944 Expensive    5
## 264 -0.648057678     Cheap    4
## 265 -0.492101444     Cheap    2
## 266 -0.436762135     Cheap    3
## 267  0.150589167 Expensive    1
## 268 -0.491598359     Cheap    2
## 269  2.440127306 Expensive    5
## 270  2.081343448 Expensive    3
## 271 -0.024232741     Cheap    2
## 272 -0.648057678     Cheap    2
## 273 -0.255651669     Cheap    4
## 274 -0.050393141     Cheap    3
## 275 -0.492101444     Cheap    2
## 276  0.920727213 Expensive    6
## 277 -0.492101444     Cheap    4
## 278 -0.648057678     Cheap    2
## 279 -0.061964088     Cheap    0
## 280 -0.240559130     Cheap    3
## 281 -0.492101444     Cheap    6
## 282 -0.490004587     Cheap    2
## 283 -0.456885520     Cheap    1
## 284 -0.486064428     Cheap    1
## 285 -0.124849666     Cheap    2
## 286 -0.473738855     Cheap    3
## 287 -0.456885520     Cheap    3
## 288 -0.489167454     Cheap    2
## 289 -0.386453672     Cheap    4
## 290 -0.492101444     Cheap    2
## 291  0.938671236 Expensive    2
## 292  1.184764137 Expensive    1
## 293 -0.388969095     Cheap    3
## 294 -0.469965720     Cheap    2
## 295 -0.489167454     Cheap    2
## 296 -0.090221345     Cheap    2
## 297 -0.502581703     Cheap    2
## 298  2.401641332 Expensive    0
## 299 -0.034294433     Cheap    2
## 300  4.332898697 Expensive    5
## 301 -0.492101444     Cheap    2
## 302 -0.180188975     Cheap    2
## 303 -0.648057678     Cheap    1
## 304 -0.399533873     Cheap    2
## 305 -0.486064428     Cheap    2
## 306  2.401641332 Expensive    0
## 307  1.583289667 Expensive    2
## 308  1.543378958 Expensive    1
## 309 -0.165096436     Cheap    3
```

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## 310  0.497550536 Expensive    3
## 311  1.025368816 Expensive    2
## 312  4.631815484 Expensive    1
## 313 -0.124849666     Cheap    2
## 314 -0.489167454     Cheap    2
## 315 -0.119818820     Cheap    4
## 316 -0.490004587     Cheap    2
## 317 -0.124849666     Cheap    2
## 318 -0.366330287     Cheap    5
## 319  2.669618414 Expensive    3
## 320  2.058537616 Expensive    4
## 321 -0.502163137     Cheap    2
## 322 -0.489167454     Cheap    2
## 323 -0.399533873     Cheap    3
## 324 -0.064479511     Cheap    2
## 325  0.751523754 Expensive    2
## 326  2.081343448 Expensive    3
## 327 -0.522538064     Cheap    6
## 328 -0.386453672     Cheap    3
## 329 -0.235025199     Cheap    3
## 330  0.518680090 Expensive    1
## 331 -0.180188975     Cheap    2
## 332 -0.074541203     Cheap    4
## 333  2.440127306 Expensive    3
## 334 -0.285836747     Cheap    1
## 335  2.041432739 Expensive    2
## 336 -0.489167454     Cheap    2
## 337  0.692159768 Expensive    2
## 338  2.058537616 Expensive    4
## 339 -0.486064428     Cheap    4
## 340  0.066322492 Expensive    4
## 341 -0.124849666     Cheap    0
## 342  4.644392600 Expensive    2
## 343 -0.386453672     Cheap    2
## 344 -0.386453672     Cheap    2
## 345 -0.386453672     Cheap    3
## 346 -0.386453672     Cheap    2
## 347 -0.386453672     Cheap    4
## 348 -0.324071178     Cheap    2
## 349 -0.328095856     Cheap    0
## 350 -0.473738855     Cheap    4
## 351 -0.462419451     Cheap    2
## 352  0.056260800 Expensive    2
## 353 -0.502581703     Cheap    1
## 354 -0.289861424     Cheap    2
## 355 -0.502666221     Cheap    2
## 356 -0.456885520     Cheap    2
## 357  0.458728501 Expensive    2
## 358 -0.386453672     Cheap    3
## 359 -0.489501503     Cheap    2
## 360 -0.489501503     Cheap    2
## 361 -0.086615234     Cheap    4
## 362 -0.090221345     Cheap    2
## 363 -0.357190246     Cheap    4
```

```
## 364 -0.506187814     Cheap    3
## 365 -0.336145210     Cheap    2
## 366 -0.502163137     Cheap    3
## 367  0.866227049 Expensive    6
## 368 -0.502581703     Cheap    2
## 369 -0.492101444     Cheap    2
## 370  0.746492908 Expensive    2
## 371  0.467617001 Expensive    2
## 372 -0.517340194     Cheap    1
## 373 -0.486064428     Cheap    1
## 374  2.081343448 Expensive    2
## 375 -0.223957338     Cheap    0
## 376  1.005496973 Expensive    2
## 377 -0.502163137     Cheap    2
## 378  3.608038268 Expensive    2
## 379 -0.567312596     Cheap    2
## 380 -0.491598359     Cheap    1
## 381  3.930515514 Expensive    4
## 382 -0.331281387     Cheap    0
## 383 -0.488579852     Cheap    3
## 384  0.398358346 Expensive    3
## 385 -0.489167454     Cheap    2
## 386  0.831011126 Expensive    1
## 387  0.295729082 Expensive    0
## 388 -0.386453672     Cheap    3
## 389 -0.492520010     Cheap    2
## 390 -0.406577057     Cheap    1
## 391  1.766748532 Expensive    3
## 392 -0.491179793     Cheap    2
## 393 -0.488579852     Cheap    2
## 394  1.631418767 Expensive    2
## 395 -0.311997147     Cheap    2
## 396 -0.491179793     Cheap    2
## 397 -0.490004587     Cheap    3
## 398 -0.124849666     Cheap    4
## 399 -0.436762135     Cheap    2
## 400 -0.393496857     Cheap    2
## 401 -0.488579852     Cheap    3
## 402 -0.486064428     Cheap    2
## 403 -0.450345420     Cheap    2
## 404 -0.329102025     Cheap    2
## 405 -0.473738855     Cheap    2
## 406 -0.225466592     Cheap    3
## 407 -0.492101444     Cheap    5
## 408 -0.270744208     Cheap    0
## 409 -0.491598359     Cheap    2
## 410 -0.135581467     Cheap    2
## 411 -0.489167454     Cheap    2
## 412 -0.510045466     Cheap    2
## 413  1.163046980 Expensive    3
## 414 -0.648057678     Cheap    2
## 415 -0.488579852     Cheap    4
## 416 -0.486064428     Cheap    2
## 417  0.005952337 Expensive    3
```

```
## 418 -0.386453672     Cheap    1
## 419 -0.386453672     Cheap    3
## 420 -0.162077929     Cheap    1
## 421 -0.489167454     Cheap    2
## 422 -0.492437505     Cheap    2
## 423 -0.489586021     Cheap    2
## 424 -0.358280933     Cheap    2
## 425 -0.241313757     Cheap    1
## 426 -0.502163137     Cheap    2
## 427 -0.124849666     Cheap    2
## 428 -0.124849666     Cheap    1
## 429 -0.492101444     Cheap    2
## 430 -0.486064428     Cheap    3
## 431 -0.113781804     Cheap    2
## 432 -0.324071178     Cheap    2
## 433 -0.124849666     Cheap    4
## 434 -0.504678560     Cheap    1
## 435  0.476839548 Expensive    5
## 436  1.766748532 Expensive    1
## 437  0.043683684 Expensive    2
## 438 -0.270744208     Cheap    2
## 439  4.644392600 Expensive    6
## 440 -0.436762135     Cheap    3
## 441 -0.119818820     Cheap    4
## 442 -0.456885520     Cheap    2
## 443 -0.491598359     Cheap    2
## 444 -0.386453672     Cheap    2
## 445 -0.484806717     Cheap    2
## 446  0.999208415 Expensive    0
## 447 -0.255651669     Cheap    1
## 448 -0.113781804     Cheap    3
## 449 -0.260515491     Cheap    0
## 450 -0.034294433     Cheap    5
## 451 -0.089633742     Cheap    3
## 452 -0.246260085     Cheap    2
## 453 -0.089633742     Cheap    3
## 454  1.145020451 Expensive    4
## 455 -0.486064428     Cheap    2
## 456 -0.489167454     Cheap    2
## 457 -0.113781804     Cheap    6
## 458  0.395591381 Expensive    2
## 459 -0.436762135     Cheap    5
## 460 -0.492101444     Cheap    2
## 461 -0.113781804     Cheap    4
## 462 -0.486064428     Cheap    3
## 463  0.126692647 Expensive    4
## 464 -0.386453672     Cheap    4
## 465 -0.486064428     Cheap    2
## 466 -0.506187814     Cheap    3
## 467 -0.648057678     Cheap    2
## 468 -0.113781804     Cheap    5
## 469 -0.492604529     Cheap    2
## 470 -0.260515491     Cheap    0
## 471 -0.502163137     Cheap    2
```

```
## 472 -0.473738855     Cheap    3
## 473 -0.089633742     Cheap    3
## 474 -0.370521988     Cheap    2
## 475 -0.450093878     Cheap    2
## 476  0.398358346 Expensive    2
## 477 -0.225466592     Cheap    3
## 478 -0.506272332     Cheap    2
## 479 -0.496713724     Cheap    2
## 480 -0.400791584     Cheap    0
## 481  0.295729082 Expensive    0
## 482 -0.648057678     Cheap    2
## 483 -0.486064428     Cheap    5
## 484 -0.455124724     Cheap    6
## 485  1.184764137 Expensive    2
## 486 -0.135581467     Cheap    2
## 487  1.163046980 Expensive    3
## 488 -0.050393141     Cheap    5
## 489 -0.486064428     Cheap    3
## 490 -0.328095856     Cheap    0
## 491 -0.246260085     Cheap    2
## 492 -0.502163137     Cheap    2
## 493 -0.034294433     Cheap    5
## 494  0.348134402 Expensive    7
## 495 -0.486064428     Cheap    2
## 496 -0.357107740     Cheap    2
## 497  0.926933265 Expensive    5
## 498 -0.344194564     Cheap    2
## 499  2.401641332 Expensive    2
## 500 -0.491179793     Cheap    2
## 501 -0.473738855     Cheap    1
## 502 -0.492101444     Cheap    2
## 503 -0.494532349     Cheap    2
## 504 -0.455124724     Cheap    3
## 505  1.092615132 Expensive    1
## 506  1.543378958 Expensive    1
## 507 -0.124849666     Cheap    3
## 508 -0.113781804     Cheap    2
## 509 -0.194778429     Cheap    2
## 510  0.488829061 Expensive    2
## 511 -0.492101444     Cheap    2
## 512 -0.486064428     Cheap    2
## 513 -0.119064193     Cheap    3
## 514  0.547271396 Expensive    5
## 515 -0.497216808     Cheap    2
## 516  0.036555981 Expensive    4
## 517 -0.436762135     Cheap    3
## 518 -0.162077929     Cheap    2
## 519 -0.124849666     Cheap    3
## 520 -0.489167454     Cheap    3
## 521  1.233478827 Expensive    3
## 522 -0.489167454     Cheap    2
## 523 -0.502666221     Cheap    2
## 524  0.518680090 Expensive    4
## 525 -0.502581703     Cheap    2
```

```
## 526 -0.492101444     Cheap    4
## 527 -0.436762135     Cheap    5
## 528  3.814890568 Expensive    2
## 529 -0.488579852     Cheap    3
## 530 -0.416638750     Cheap    2
## 531 -0.124849666     Cheap    0
## 532 -0.502581703     Cheap    2
## 533 -0.502581703     Cheap    1
## 534 -0.198132998     Cheap    2
## 535 -0.473738855     Cheap    3
## 536 -0.119818820     Cheap    0
## 537 -0.113781804     Cheap    4
## 538  1.493573580 Expensive    3
## 539 -0.356268595     Cheap    2
## 540  0.348049883 Expensive    2
## 541  0.780702663 Expensive    3
## 542 -0.018698810     Cheap    0
## 543 -0.018698810     Cheap    1
## 544 -0.124849666     Cheap    3
## 545  1.493573580 Expensive    5
## 546 -0.124849666     Cheap    6
## 547 -0.124849666     Cheap    1
## 548 -0.369097253     Cheap    2
## 549 -0.235025199     Cheap    3
## 550  0.091476724 Expensive    0
## 551  1.583289667 Expensive    1
## 552 -0.124849666     Cheap    2
## 553 -0.490507672     Cheap    2
## 554 -0.502666221     Cheap    2
## 555 -0.491598359     Cheap    2
## 556 -0.113781804     Cheap    6
## 557  0.148828371 Expensive    4
## 558  3.930515514 Expensive    2
## 559  0.954769944 Expensive    3
## 560 -0.297910778     Cheap    3
## 561 -0.492101444     Cheap    2
## 562 -0.489167454     Cheap    4
## 563 -0.376391980     Cheap    2
## 564 -0.486064428     Cheap    2
## 565 -0.486064428     Cheap    2
## 566 -0.162077929     Cheap    2
## 567 -0.489167454     Cheap    1
## 568 -0.223957338     Cheap    2
## 569 -0.502581703     Cheap    2
## 570 -0.490004587     Cheap    3
## 571 -0.436762135     Cheap    6
## 572  0.387878087 Expensive    5
## 573 -0.117051854     Cheap    3
## 574 -0.492101444     Cheap    2
## 575 -0.486064428     Cheap    1
## 576 -0.356268595     Cheap    1
## 577 -0.386453672     Cheap    3
## 578  0.476839548 Expensive    3
## 579 -0.357107740     Cheap    2
```

```
## 580 -0.488579852     Cheap    3
## 581 -0.044356126     Cheap    2
## 582  1.583289667 Expensive    3
## 583 -0.124849666     Cheap    5
## 584  0.159393148 Expensive    3
## 585 -0.472732686     Cheap    2
## 586  0.954769944 Expensive    1
## 587 -0.346206902     Cheap    4
## 588  0.945714421 Expensive    6
## 589 -0.486064428     Cheap    2
## 590 -0.486064428     Cheap    2
## 591 -0.504678560     Cheap    3
## 592  0.926933265 Expensive    5
## 593 -0.502163137     Cheap    4
## 594 -0.492101444     Cheap    2
## 595 -0.124849666     Cheap    3
## 596 -0.162077929     Cheap    3
## 597  0.016014029 Expensive    2
## 598 -0.648057678     Cheap    4
## 599 -0.502666221     Cheap    2
## 600  0.497550536 Expensive    4
## 601 -0.104726281     Cheap    2
## 602 -0.489167454     Cheap    2
## 603  0.205173849 Expensive    2
## 604 -0.486064428     Cheap    4
## 605 -0.113781804     Cheap    3
## 606 -0.335139040     Cheap    3
## 607 -0.489167454     Cheap    3
## 608 -0.034294433     Cheap    2
## 609  0.188656575 Expensive    2
## 610  2.440127306 Expensive    4
## 611 -0.018698810     Cheap    3
## 612 -0.506187814     Cheap    2
## 613 -0.336145210     Cheap    2
## 614 -0.492101444     Cheap    2
## 615 -0.486064428     Cheap    3
## 616  0.659962352 Expensive    2
## 617 -0.358280933     Cheap    3
## 618 -0.324071178     Cheap    2
## 619  0.136754340 Expensive    0
## 620 -0.436762135     Cheap    2
## 621 -0.357190246     Cheap    2
## 622  0.409510726 Expensive    4
## 623 -0.331281387     Cheap    2
## 624 -0.490004587     Cheap    2
## 625 -0.324071178     Cheap    2
## 626  0.002346226 Expensive    6
## 627 -0.399533873     Cheap    5
## 628  0.920727213 Expensive    2
## 629 -0.489167454     Cheap    2
## 630 -0.492437505     Cheap    2
## 631 -0.044356126     Cheap    8
## 632 -0.506103295     Cheap    5
## 633 -0.034294433     Cheap    3
```

```
## 634 -0.648057678     Cheap    2
## 635 -0.086615234     Cheap    0
## 636 -0.386453672     Cheap    2
## 637 -0.488579852     Cheap    3
## 638 -0.119818820     Cheap    3
## 639  0.150589167 Expensive    4
## 640 -0.324071178     Cheap    2
## 641 -0.490004587     Cheap    2
## 642  0.746492908 Expensive    2
## 643 -0.086615234     Cheap    0
## 644  0.488829061 Expensive    2
## 645 -0.260515491     Cheap    0
## 646  0.895993561 Expensive    4
## 647 -0.489167454     Cheap    1
## 648  0.066322492 Expensive    5
## 649 -0.496126121     Cheap    2
## 650 -0.496126121     Cheap    2
## 651 -0.489167454     Cheap    2
## 652 -0.185219821     Cheap    1
## 653 -0.478351135     Cheap    2
## 654 -0.490507672     Cheap    2
## 655 -0.512224829     Cheap    1
## 656  0.831011126 Expensive    2
## 657 -0.489167454     Cheap    2
## 658 -0.336145210     Cheap    3
## 659 -0.386453672     Cheap    2
## 660  1.631418767 Expensive    5
## 661  2.041432739 Expensive    5
## 662 -0.502666221     Cheap    4
## 663 -0.133150562     Cheap    4
## 664 -0.497216808     Cheap    3
## 665 -0.488579852     Cheap    2
## 666  0.831011126 Expensive    3
## 667 -0.386453672     Cheap    2
## 668 -0.491598359     Cheap    2
## 669 -0.486064428     Cheap    4
## 670  0.398358346 Expensive    2
## 671  0.136754340 Expensive    4
## 672  0.398358346 Expensive    3
## 673 -0.436762135     Cheap    7
## 674 -0.386453672     Cheap    3
## 675 -0.648057678     Cheap    2
## 676 -0.491598359     Cheap    1
## 677 -0.486064428     Cheap    2
## 678 -0.450009359     Cheap    1
## 679  0.295729082 Expensive    4
## 680  9.661740105 Expensive    3
## 681 -0.484303632     Cheap    2
## 682  0.895993561 Expensive    2
## 683 -0.462419451     Cheap    2
## 684  0.295729082 Expensive    1
## 685  0.136754340 Expensive    6
## 686  0.188656575 Expensive    2
## 687  0.150589167 Expensive    1
```

```
## 688 -0.443386753     Cheap    1
## 689 -0.491179793     Cheap    1
## 690  3.604768218 Expensive    1
## 691  0.498975272 Expensive    3
## 692 -0.378068258     Cheap    0
## 693  0.488829061 Expensive    2
## 694 -0.502666221     Cheap    2
## 695 -0.113781804     Cheap    6
## 696 -0.376391980     Cheap    5
## 697 -0.486064428     Cheap    4
## 698 -0.492437505     Cheap    2
## 699  1.583289667 Expensive    4
## 700 -0.494113782     Cheap    4
## 701  3.930515514 Expensive    1
## 702 -0.119064193     Cheap    3
## 703 -0.357190246     Cheap    1
## 704 -0.492268468     Cheap    2
## 705 -0.490004587     Cheap    2
## 706 -0.124849666     Cheap    3
## 707 -0.376391980     Cheap    4
## 708 -0.119064193     Cheap    4
## 709  2.401641332 Expensive    2
## 710 -0.341260574     Cheap    2
## 711  0.348134402 Expensive    2
## 712 -0.113781804     Cheap    2
## 713  0.398358346 Expensive    4
## 714 -0.457221581     Cheap    2
## 715 -0.386453672     Cheap    5
## 716 -0.494113782     Cheap    1
## 717  3.930515514 Expensive    3
## 718 -0.436762135     Cheap    2
## 719 -0.336145210     Cheap    2
## 720 -0.491598359     Cheap    3
## 721  0.016014029 Expensive    0
## 722 -0.506103295     Cheap    1
## 723 -0.386453672     Cheap    3
## 724 -0.386453672     Cheap    5
## 725  0.420494070 Expensive    2
## 726 -0.473738855     Cheap    2
## 727 -0.225466592     Cheap    3
## 728 -0.492352986     Cheap    2
## 729 -0.124849666     Cheap    2
## 730 -0.488579852     Cheap    2
## 731  3.604768218 Expensive    2
## 732 -0.269989581     Cheap    1
## 733 -0.648057678     Cheap    2
## 734 -0.386453672     Cheap    2
## 735 -0.386453672     Cheap    2
## 736 -0.324071178     Cheap    2
## 737  0.043683684 Expensive    4
## 738  9.661740105 Expensive    3
## 739 -0.489167454     Cheap    2
## 740 -0.489167454     Cheap    2
## 741 -0.044356126     Cheap    2
```

```
## 742  0.938671236 Expensive    3
## 743  4.631815484 Expensive    2
## 744 -0.324071178     Cheap    2
## 745 -0.488579852     Cheap    3
## 746  0.780702663 Expensive    7
## 747 -0.240559130     Cheap    1
## 748 -0.386453672     Cheap    3
## 749  0.420494070 Expensive    1
## 750 -0.492101444     Cheap    3
## 751 -0.185219821     Cheap    0
## 752 -0.397018449     Cheap    0
## 753 -0.456885520     Cheap    3
## 754 -0.489167454     Cheap    2
## 755  0.659962352 Expensive    4
## 756 -0.356268595     Cheap    0
## 757 -0.491179793     Cheap    2
## 758 -0.416638750     Cheap    1
## 759 -0.486064428     Cheap    3
## 760  1.092615132 Expensive    3
## 761 -0.356268595     Cheap    2
## 762 -0.504678560     Cheap    4
## 763 -0.502581703     Cheap    2
## 764  1.766748532 Expensive    3
## 765 -0.491598359     Cheap    1
## 766  0.920727213 Expensive    5
## 767  0.148828371 Expensive    2
## 768 -0.492101444     Cheap    3
## 769 -0.162077929     Cheap    2
## 770 -0.479775871     Cheap    3
## 771 -0.456885520     Cheap    2
## 772 -0.490004587     Cheap    4
## 773 -0.436762135     Cheap    5
## 774 -0.502666221     Cheap    2
## 775 -0.185219821     Cheap    5
## 776 -0.492101444     Cheap    1
## 777 -0.492101444     Cheap    2
## 778 -0.397018449     Cheap    0
## 779 -0.492352986     Cheap    2
## 780  3.604768218 Expensive    4
## 781 -0.502581703     Cheap    1
## 782  0.498975272 Expensive    1
## 783 -0.044356126     Cheap    2
## 784 -0.176164298     Cheap    2
## 785 -0.506187814     Cheap    2
## 786 -0.502163137     Cheap    2
## 787 -0.497216808     Cheap    1
## 788 -0.061964088     Cheap    0
## 789 -0.234019030     Cheap    0
## 790  0.945714421 Expensive    4
## 791 -0.492101444     Cheap    2
## 792 -0.124849666     Cheap    1
## 793  0.751523754 Expensive    2
## 794 -0.030354274     Cheap    2
## 795 -0.489167454     Cheap    2
```

```
## 796 -0.386453672     Cheap    3
## 797 -0.126274402     Cheap    4
## 798 -0.473320289     Cheap    3
## 799 -0.502581703     Cheap    3
## 800 -0.162077929     Cheap    3
## 801 -0.386453672     Cheap    3
## 802 -0.119818820     Cheap    3
## 803  1.766748532 Expensive    1
## 804 -0.476672845     Cheap    0
## 805 -0.507697067     Cheap    2
## 806 -0.491598359     Cheap    3
## 807 -0.648057678     Cheap    3
## 808 -0.491598359     Cheap    1
## 809 -0.386453672     Cheap    3
## 810  0.420494070 Expensive    3
## 811 -0.489334479     Cheap    2
## 812 -0.162077929     Cheap    3
## 813 -0.436762135     Cheap    3
## 814 -0.018698810     Cheap    0
## 815 -0.486064428     Cheap    3
## 816 -0.648057678     Cheap    2
## 817 -0.488579852     Cheap    2
## 818  0.096592088 Expensive    3
## 819 -0.518261845     Cheap    4
## 820 -0.086615234     Cheap    1
## 821  1.233478827 Expensive    5
## 822 -0.473738855     Cheap    2
## 823 -0.648057678     Cheap    3
## 824 -0.397018449     Cheap    2
## 825  0.150589167 Expensive    0
## 826 -0.508200152     Cheap    2
## 827  0.488829061 Expensive    2
## 828  0.096592088 Expensive    0
## 829 -0.492101444     Cheap    2
## 830  0.961813129 Expensive    6
## 831 -0.357190246     Cheap    1
## 832 -0.270744208     Cheap    0
## 833 -0.502581703     Cheap    2
## 834 -0.490004587     Cheap    2
## 835 -0.481033582     Cheap    1
## 836  1.025368816 Expensive    3
## 837 -0.473738855     Cheap    2
## 838 -0.486064428     Cheap    2
## 839  0.488829061 Expensive    3
## 840 -0.050393141     Cheap    2
## 841 -0.488579852     Cheap    2
## 842 -0.436762135     Cheap    1
## 843 -0.024232741     Cheap    3
## 844 -0.518513387     Cheap    3
## 845 -0.473738855     Cheap    1
## 846 -0.496126121     Cheap    4
## 847  0.751523754 Expensive    2
## 848 -0.489167454     Cheap    3
## 849  0.016014029 Expensive    2
```

```
## 850  1.145020451 Expensive    2
## 851 -0.018698810     Cheap    0
## 852 -0.491598359     Cheap    7
## 853 -0.341260574     Cheap    0
## 854  0.144803694 Expensive    1
## 855 -0.124849666     Cheap    4
## 856 -0.459904028     Cheap    1
## 857  2.669618414 Expensive    4
## 858 -0.113781804     Cheap    5
## 859 -0.260515491     Cheap    2
## 860 -0.502581703     Cheap    2
## 861 -0.364150925     Cheap    4
## 862 -0.416638750     Cheap    2
## 863 -0.126274402     Cheap    4
## 864  0.751523754 Expensive    2
## 865 -0.386453672     Cheap    2
## 866 -0.386453672     Cheap    4
## 867 -0.369181771     Cheap    2
## 868  0.368088750 Expensive    3
## 869 -0.456885520     Cheap    2
## 870 -0.424017995     Cheap    0
## 871 -0.489167454     Cheap    2
## 872  0.409510726 Expensive    4
## 873 -0.547440753     Cheap    3
## 874 -0.466947213     Cheap    4
## 875 -0.165096436     Cheap    2
## 876 -0.502666221     Cheap    1
## 877 -0.449926854     Cheap    2
## 878 -0.489167454     Cheap    1
## 879 -0.489167454     Cheap    2
## 880  1.025368816 Expensive    5
## 881 -0.124849666     Cheap    2
## 882 -0.489167454     Cheap    3
## 883 -0.436426074     Cheap    2
## 884 -0.436762135     Cheap    2
## 885 -0.506187814     Cheap    2
## 886 -0.061964088     Cheap    3
## 887 -0.386453672     Cheap    2
## 888 -0.044356126     Cheap    1
## 889 -0.176164298     Cheap    2
## 890 -0.044356126     Cheap    2
## 891 -0.492101444     Cheap    3
```

##23. Show the frequency of Ports of Embarkation. It appears that there are two missing values in the Embarked variable. Assign the most frequent port to the missing ports. Hint: Use the levels function to modify the categories of categorical variables.

```r
table(newtitanic$Embarked)#Check most frequent port in the dataset
```

```
##
##       C   Q   S
##   2 168  77 644
```

```r
newtitanic$Embarked[newtitanic$Embarked=='']<-'S'
table(newtitanic$Embarked)
```

```
##
##       C   Q   S
##   0 168  77 646
```