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Roll No	23
Program	Computer Engineering
Year	Third Year
Division	A
Subject	DMPM
Assignment No	2

## DMPM Lab Assignment -2

### Data Pre-processing & Data Cleaning Functions

- Read the datasets given to you and clean the data as per the requirements.
- Test following data pre-processing and data cleaning functions
- You need to install following packages and use following libraries
  - `install.packages("tidyverse")`, `install.packages("Hmisc")`
  - `library(tidyverse)`, `library(dplyr)`, `library(ggplot2)`, `library(Hmisc)`
- **Save your R command file.**
- **Save your code and results in a word file and submit it on the VOLP.**
- **FUNCTIONS**
  - `rename()` - for rename columns
  - `select()` - for selecting columns
  - `slice()` - for selecting rows
  - `sample_n()` -- for sampling rows
  - `arrange()` -- for arranging rows by column values
  - `filter()` -- for filtering rows
  - `mutate()` -- for transforming values in a field
  - `is.na()` --- find missing data
  - `sum(is.na())` -- find number of missing values
  - `mean(is.na())` -- find % of missing values
  - `na.omit()` -- deleting incomplete observations
  - `mean(<column>, na.rm = TRUE)` -- find mean leaving records with missing data
  - `complete.cases()` --- to detect rows with complete data
  - `clean=na.omit()` --- to remove incomplete rows or data
  - `glimpse(data)` -- summarise dataset
  - `boxplot.stats()` - for detecting outlier stats
  - `boxplot()` - for comparing boxplots
  - `boxplot.stats()$out` -- for setting outlier detection limit

### Numerical imputation

- `dirty$column[is.na(column)] <- mean(column, na.rm = TRUE) --- mean imputation`
- `dirty$column <- impute(dirty$column, fun = mean) # mean imputation`
- `dirty$column <- impute(dirty$column, fun = median) # median imputation`

## Code:

```
library(readxl)
Titanic_dataset <- read_excel("P:/College/SEM - 6/DMPM_Lab/Titanic_dataset.xlsx")
View(Titanic_dataset)
```

```
library(tidyverse)
library(dplyr)
library(ggplot2)
library(Hmisc)
```

```
DF <- data.frame(Titanic_dataset)
fare <- DF$fare
```

```
DF <- rename(DF, Gender = sex)
View(DF$Gender)
DF$Gender
```

```
select_DF <- select(DF, Gender)
select_DF
```

```
slice_DF <- slice(DF, 1, 100)
slice_DF
```

```
sample_DF <- sample_n(DF, 10)
sample_DF
```

```
arrange_DF <- arrange(DF, DF$Gender)
arrange_DF
```

```
filter_DF <- filter(,DF$age < 20)
filter_DF
```

```
mutated_DF <- mutate(DF, fare = fare * 2)
mutated_DF$fare
```

```
missing_DF <- sum(is.na(DF$boat))
missing_DF
```

```
per_missing_DF <- mean(is.na(DF$boat)) * 100
per_missing_DF
```

```
complete_DF <- na.omit(DF$boat)
complete_DF
```

```
column_mean <- mean(DF$survived, na.rm = TRUE)
column_mean
```

```
complete_rows <- complete.cases(DF)
complete_rows
```

```
clean_DF <- na.omit(DF)
clean_DF
```

```
glimpse(DF)
```

```
outlier_stats <- boxplot.stats(DF$survived)
outlier_stats
```

```
boxplot(DF$survived, DF$age)
```

```
outlier_limit <- boxplot.stats(DF$age)$out
outlier_limit
```

```
value_imputed <- data.frame(
  original = DF$age,
  imputed_zero = replace(DF$age, is.na(DF$age), 0),
  imputed_mean = replace(DF$age, is.na(DF$age), mean(DF$age, na.rm = TRUE)),
  imputed_median = replace(DF$age, is.na(DF$age), median(DF$age, na.rm = TRUE))
)
value_imputed
```

## Output:

```
> library(readxl)
> Titanic_dataset <- read_excel("P:/College/SEM - 6/DMPM_Lab/Titanic_dataset.xlsx")
> View(Titanic_dataset)
> library(tidyverse)
> library(dplyr)
> library(ggplot2)
> library(Hmisc)
Error: package or namespace load failed for 'Hmisc' in loadNamespace(j<-i[[1L]], c(lib.loc, .libPaths()), versionCheck = vI[[j]]) :
  there is no package called 'data.table'
> DF <- data.frame(Titanic_dataset)
> fare <- DF$fare
> DF <- rename(DF, Gender = sex)
> View(DF$Gender)
> DF$Gender
 [1] "female" "male"   "female" "male"   "female" "male"   "female" "male"   "female"
"male"   "male"   "female" "female" "female" "male"   "male"   "female" "male"   "female"
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```

```
[ reached getOption("max.print") -- omitted 309 entries ]
```

```
> select_DF <- select(Df, Gender)
```

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2     male
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1000 female

[ reached 'max' / getOption("max.print") -- omitted 309 rows ]
> slice_DF <- slice(DF, 1, 100)
> slice_DF
  pclass survived      name Gender age sibsp parch      ticket
1      1         1      Allen, Miss. Elisabeth Walton female
male  29         0         0  24160 211.3375      B5         S         2
2      1         1  Duff Gordon, Lady. (Lucille Christiana Sutherland) ("Mrs Morgan") female
male  48         1         0  11755  39.6000     A16         C         1
> sample_DF <- sample_n(DF, 10)
> sample_DF
  pclass survived      name Gender age sibsp parch      ticket
fare cabin embarked boat
1      2         0      Mack, Mrs. (Mary) female  57         0         0 S.O./P.P. 3
10.5000     E77      S <NA>
2      2         1  Herman, Mrs. Samuel (Jane Laver) female  48         1         2  220845
65.0000 <NA>      S         9
3      2         0      Malachard, Mr. Noel   male   NA         0         0  237735
15.0458     D      C <NA>
4      1         1  Oliva y Ocana, Dona. Fermina female  39         0         0  PC 17758
108.9000  C105      C         8
5      1         0      Baumann, Mr. John D   male   NA         0         0  PC 17318
25.9250 <NA>      S <NA>
6      1         1  Frolicher-Stehli, Mr. Maxmillian male   60         1         1  13567
79.2000     B41      C         5
7      1         0      Rothschild, Mr. Martin male   55         1         0  PC 17603
59.4000 <NA>      C <NA>
8      3         0      Yousseff, Mr. Gerious  male   NA         0         0  2627
14.4583 <NA>      C <NA>

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9      3      1      Krekorian, Mr. Neshan   male  25      0      0      2654
7.2292 F E57      C      10
10     3      1      Mulvihill, Miss. Bertha E female  24      0      0      382653
7.7500 <NA>      Q      15
> arrange_DF <- arrange(DF, DF$Gender)
> arrange_DF
  pclass survived      name G
ender age sibsp parch ticket fare cabin
1      1      0      1      24160 211.3375      B5 Allen, Miss. Elisabeth Walton f
emale 29      0      0
2      1      0      2      113781 151.5500      C22 C26 Allison, Miss. Helen Loraine f
emale 2      1      0
3      1      0      2      113781 151.5500      C22 C26 Allison, Mrs. Hudson J C (Bessie Waldo Daniels) f
emale 25      1      2
4      1      1      1      13502 77.9583      D7 Andrews, Miss. Kornelia Theodosia f
emale 63      1      0
5      1      1      1      11769 51.4792      C101 Appleton, Mrs. Edward Dale (Charlotte Lamson) f
emale 53      2      0
6      1      1      1      PC 17757 227.5250      C62 C64 Astor, Mrs. John Jacob (Madeleine Talmadge Force) f
emale 18      1      0
7      1      1      1      PC 17477 69.3000      B35 Aubart, Mme. Leontine Pauline f
emale 24      0      0
8      1      0      0      19877 78.8500      <NA> Barber, Miss. Ellen "Nellie" f
emale 26      0      0
9      1      1      1      PC 17558 247.5208      B58 B60 Baxter, Mrs. James (Helene DeLaudeniére Chaput) f
emale 50      0      1
10     1      1      1      11813 76.2917      D15 Bazzani, Miss. Albina f
emale 32      0      0
11     1      1      1      11751 52.5542      D35 Beckwith, Mrs. Richard Leonard (Sallie Monypeny) f
emale 47      1      1
12     1      1      1      PC 17757 227.5250      <NA> Bidois, Miss. Rosalie f
emale 42      0      0
13     1      1      1      PC 17483 221.7792      C97 Bird, Miss. Ellen f
emale 29      0      0
14     1      1      1      11967 91.0792      B49 Bishop, Mrs. Dickinson H (Helen Walton) f
emale 19      1      0
15     1      1      1      PC 17760 135.6333      C99 Bissette, Miss. Amelia f
emale 35      0      0
16     1      1      1      36928 164.8667      C7 Bonnell, Miss. Caroline f
emale 30      0      0
17     1      1      1      113783 26.5500      C103 Bonnell, Miss. Elizabeth f
emale 58      0      0
18     1      1      1      PC 17608 262.3750      <NA> Bowen, Miss. Grace Scott f
emale 45      0      0
19     1      1      1      113505 55.0000      E33 Bowerman, Miss. Elsie Edith f
emale 22      0      1
20     1      1      1      PC 17610 27.7208      B4 Brown, Mrs. James Joseph (Margaret Tobin) f
emale 44      0      0
21     1      1      1      11769 51.4792      C101 Brown, Mrs. John Murray (Caroline Lane Lamson) f
emale 59      2      0
22     1      1      1      11813 76.2917      D15 Bucknell, Mrs. William Robert (Emma Eliza Ward) f
emale 60      0      0
23     1      1      1      16966 134.5000      E40 Burns, Miss. Elizabeth Margaret f
emale 41      0      0
24     1      1      1      PC 17606 27.4458      <NA> Candee, Mrs. Edward (Helen Churchill Hungerford) f
emale 53      0      0
25     1      1      1      PC 17755 512.3292 B51 B53 B55 Cardeza, Mrs. James Warburton Martinez (Charlotte Wardle Drake) f
emale 58      0      1
26     1      1      2      113760 120.0000      B96 B98 Carter, Miss. Lucile Polk f
emale 14      1      2
27     1      1      2      113760 120.0000      B96 B98 Carter, Mrs. William Ernest (Lucile Polk) f
emale 36      1      2
28     1      1      1      17770 27.7208      <NA> Cassebeer, Mrs. Henry Arthur Jr (Eleanor Genevieve Fosdick) f
emale NA      0      0
29     1      1      1      19877 78.8500      C46 Cavendish, Mrs. Tyrell William (Julia Florence Siegel) f
emale 76      1      0
30     1      1      1      W.E.P. 5734 61.1750      E31 Chaffee, Mrs. Herbert Fuller (Carrie Constance Toogood) f
emale 47      1      0
31     1      1      1      113806 53.1000      E8 Chambers, Mrs. Norman Campbell (Bertha Griggs) f
emale 33      1      0
32     1      1      1      PC 17608 262.3750      B61 Chaudanson, Miss. Victorine f
emale 36      0      0
33     1      1      1      110152 86.5000      B77 Cherry, Miss. Gladys f
emale 30      0      0
34     1      1      1      113505 55.0000      E33 Chibnall, Mrs. (Edith Martha Bowerman) f
emale NA      0      1

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35	1	1		Clark, Mrs. Walter Miller (Virginia McDowell)	f
emale	26	1	0	13508 136.7792 C89	
36	1	1			Cleaver, Miss. Alice f
emale	22	0	0	113781 151.5500 <NA>	
37	1	1			Compton, Miss. Sara Rebecca f
emale	39	1	1	PC 17756 83.1583 E49	
38	1	1			Compton, Mrs. Alexander Taylor (Mary Eliza Ingersoll) f
emale	64	0	2	PC 17756 83.1583 E45	
39	1	1			Cornell, Mrs. Robert Clifford (Malvina Helen Lamson) f
emale	55	2	0	11770 25.7000 C101	
40	1	1			Crosby, Miss. Harriet R f
emale	36	0	2	WE/P 5735 71.0000 B22	
41	1	1			Crosby, Mrs. Edward Gifford (Catherine Elizabeth Halstead) f
emale	64	1	1	112901 26.5500 B26	
42	1	1			Cummings, Mrs. John Bradley (Florence Briggs Thayer) f
emale	38	1	0	PC 17599 71.2833 C85	
43	1	1			Daniels, Miss. Sarah f
emale	33	0	0	113781 151.5500 <NA>	
44	1	1			Davidson, Mrs. Thornton (Orlan Hays) f
emale	27	1	2	F.C. 12750 52.0000 B71	
45	1	1			Dick, Mrs. Albert Adrian (Vera Gillespie) f
emale	17	1	0	17474 57.0000 B20	
46	1	1			Dodge, Mrs. Washington (Ruth Vidaver) f
emale	54	1	1	33638 81.8583 A34	
47	1	1			Douglas, Mrs. Frederick Charles (Mary Helene Baxter) f
emale	27	1	1	PC 17558 247.5208 B58 B60	
48	1	1			Douglas, Mrs. Walter Donald (Mahala Dutton) f
emale	48	1	0	PC 17761 106.4250 C86	
49	1	1			Duff Gordon, Lady. (Lucille Christiana Sutherland) ("Mrs Morgan") f
emale	48	1	0	11755 39.6000 A16	
50	1	1			Earnshaw, Mrs. Boulton (Olive Potter) f
emale	23	0	1	11767 83.1583 C54	
51	1	1			Endres, Miss. Caroline Louise f
emale	38	0	0	PC 17757 227.5250 C45	
52	1	1			Eustis, Miss. Elizabeth Mussey f
emale	54	1	0	36947 78.2667 D20	
53	1	0			Evans, Miss. Edith Corse f
emale	36	0	0	PC 17531 31.6792 A29	
54	1	1			Flegenheim, Mrs. Alfred (Antoinette) f
emale	NA	0	0	PC 17598 31.6833 <NA>	
55	1	1			Fleming, Miss. Margaret f
emale	NA	0	0	17421 110.8833 <NA>	
56	1	1			Fortune, Miss. Alice Elizabeth f
emale	24	3	2	19950 263.0000 C23 C25 C27	
57	1	1			Fortune, Miss. Ethel Flora f
emale	28	3	2	19950 263.0000 C23 C25 C27	
58	1	1			Fortune, Miss. Mabel Helen f
emale	23	3	2	19950 263.0000 C23 C25 C27	
59	1	1			Fortune, Mrs. Mark (Mary McDougald) f
emale	60	1	4	19950 263.0000 C23 C25 C27	
60	1	1			Francatelli, Miss. Laura Mabel f
emale	30	0	0	PC 17485 56.9292 E36	
61	1	1			Frauenthal, Mrs. Henry William (Clara Heinsheimer) f
emale	NA	1	0	PC 17611 133.6500 <NA>	
62	1	1			Frolicher, Miss. Hedwig Margaritha f
emale	22	0	2	13568 49.5000 B39	
63	1	1			Frolicher-Stehli, Mrs. Maxmillian (Margaretha Emerentia Stehli) f
emale	48	1	1	13567 79.2000 B41	
64	1	1			Futrelle, Mrs. Jacques Heath (Lily May Peel) f
emale	35	1	0	113803 53.1000 C123	
65	1	1			Geiger, Miss. Amalie f
emale	35	0	0	113503 211.5000 C130	
66	1	1			Gibson, Miss. Dorothy Winifred f
emale	22	0	1	112378 59.4000 <NA>	
67	1	1			Gibson, Mrs. Leonard (Pauline C Boeson) f
emale	45	0	1	112378 59.4000 <NA>	
68	1	1			Goldenberg, Mrs. Samuel L (Edwiga Grabowska) f
emale	NA	1	0	17453 89.1042 C92	
69	1	1			Graham, Miss. Margaret Edith f
emale	19	0	0	112053 30.0000 B42	
70	1	1			Graham, Mrs. William Thompson (Edith Junkins) f
emale	58	0	1	PC 17582 153.4625 C125	
71	1	1			Greenfield, Mrs. Leo David (Blanche Strouse) f
emale	45	0	1	PC 17759 63.3583 D10 D12	
72	1	1			Harder, Mrs. George Achilles (Dorothy Annan) f
emale	25	1	0	11765 55.4417 E50	

73	1	1					Harper, Mrs. Henry Sleeper (Myna Haxtun)	f
emale	49	1	0	PC 17572	76.7292	D33		
74	1	1					Harris, Mrs. Henry Birkhardt (Irene Wallach)	f
emale	35	1	0	36973	83.4750	C83		
75	1	1					Hays, Miss. Margaret Bechstein	f
emale	24	0	0	11767	83.1583	C54		
76	1	1					Hays, Mrs. Charles Melville (Clara Jennings Gregg)	f
emale	52	1	1	12749	93.5000	B69		
77	1	1					Hippach, Miss. Jean Gertrude	f
emale	16	0	1	111361	57.9792	B18		
78	1	1					Hippach, Mrs. Louis Albert (Ida Sophia Fischer)	f
emale	44	0	1	111361	57.9792	B18		
79	1	1					Hogeboom, Mrs. John C (Anna Andrews)	f
emale	51	1	0	13502	77.9583	D11		
80	1	1					Holverson, Mrs. Alexander Oskar (Mary Aline Towner)	f
emale	35	1	0	113789	52.0000	<NA>		
81	1	1					Hoyt, Mrs. Frederick Maxfield (Jane Anne Forby)	f
emale	35	1	0	19943	90.0000	C93		
82	1	1					Icard, Miss. Amelie	f
emale	38	0	0	113572	80.0000	B28		
83	1	0					Isham, Miss. Ann Elizabeth	f
emale	50	0	0	PC 17595	28.7125	C49		
embarked boat								
1	S	2						
2	S	<NA>						
3	S	<NA>						
4	S	10						
5	S	D						
6	C	4						
7	C	9						
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11	S	5						
12	C	4						
13	S	8						
14	C	7						
15	S	8						
16	S	8						
17	S	8						
18	C	4						
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21	S	D						
22	C	8						
23	C	3						
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25	C	3						
26	S	4						
27	S	4						
28	C	5						
29	S	6						
30	S	4						
31	S	5						
32	C	4						
33	S	8						
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35	C	4						
36	S	11						
37	C	14						
38	C	14						
39	S	2						
40	S	7						
41	S	7						
42	C	4						
43	S	8						
44	S	3						
45	S	3						
46	S	5						
47	C	6						
48	C	2						
49	C	1						
50	C	7						
51	C	4						
52	C	4						
53	C	<NA>						

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54      S      7
55      C      4
56      S     10
57      S     10
58      S     10
59      S     10
60      C      1
61      S      5
62      C      5
63      C      5
64      S      D
65      C      4
66      C      7
67      C      7
68      C      5
69      S      3
70      S      3
71      C      7
72      C      5
73      C      3
74      S      D
75      C      7
76      S      3
77      C      4
78      C      4
79      S     10
80      S      8
81      S      D
82      <NA>    6
83      C <NA>

[ reached 'max' / getOption("max.print") -- omitted 1226 rows ]
> filter_DF <- filter(DF, DF$age < 20)
> filter_DF
  pclass survived
name Gender      age sibsp parch
1      1      1
. Hudson Trevor   male  0.9167    1    2 Allison, Master
2      1      0
. Helen Loraine  female 2.0000    1    2 Allison, Miss
3      1      1
Talmadge Force) female 18.0000    1    0 Astor, Mrs. John Jacob (Madeleine
4      1      1
(Helen Walton) female 19.0000    1    0 Bishop, Mrs. Dickinson H
5      1      0
Mr. Jose Pedro  male 17.0000    0    0 Carrau,
6      1      1
iam Thornton II male 11.0000    1    2 Carter, Master. Will
7      1      1
ss. Lucile Polk female 14.0000    1    2 Carter, Mi
8      1      1
Vera Gillespie) female 17.0000    1    0 Dick, Mrs. Albert Adrian (
9      1      1
ter. Washington male  4.0000    0    2 Dodge, Mas
10     1      0
Charles Alexander male 19.0000    3    2 Fortune, Mr. Ch
11     1      1
Margaret Edith female 19.0000    0    0 Graham, Miss.
12     1      1
. Jean Gertrude female 16.0000    0    1 Hippach, Miss
13     1      1
s. Mary Conover female 16.0000    0    1 Lines, Mis
14     1      1
gette Alexandra female 15.0000    0    1 Madill, Miss. Geor
15     1      1
, Miss. Roberta female 16.0000    0    0 Maioni
16     1      0
. Daniel Warner male 19.0000    1    0 Marvin, Mr
17     1      1
ael Farquarson) female 18.0000    1    0 Marvin, Mrs. Daniel Warner (Mary Graham Carmich
18     1      1
Helen Monypeny female 19.0000    0    2 Newsom, Miss.
19     1      0
ictor de Satode male 18.0000    1    0 Penasco y Castellana, Mr. V
20     1      1
Soto y Vallejo) female 17.0000    1    0 Penasco y Castellana, Mrs. Victor de Satode (Maria Josefa Perez de

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21	1	1				Ryerson, Mas
ter. John Borie	male	13.0000	2	2		
22	1	1				Ryerson, Mi
ss. Emily Borie	female	18.0000	2	2		
23	1	1				Smith, Mrs. Lucien Philip (Mary
Eloise Hughes)	female	18.0000	1	0		
24	1	1				Spedden, Master.
Robert Douglas	male	6.0000	0	2		
25	1	1				Taus
sig, Miss. Ruth	female	18.0000	0	2		
26	1	1				Thayer, Mr.
John Borland Jr	male	17.0000	0	2		
27	2	0				Andrew, Mr.
Edgardo Samuel	male	18.0000	0	0		
28	2	0				Bailey, M
r. Percy Andrew	male	18.0000	0	0		
29	2	1				Beane, Mrs. Edward
(Ethel Clarke)	female	19.0000	1	0		
30	2	1				Becker, Ma
ster. Richard F	male	1.0000	2	1		
31	2	1				Becker, Miss
. Marion Louise	female	4.0000	2	1		
32	2	1				Becker, Miss.
Ruth Elizabeth	female	12.0000	2	1		
33	2	1				Bentham,
Miss. Lilian W	female	19.0000	0	0		
34	2	1				Brown, Mis
s. Edith Eileen	female	15.0000	0	2		
35	2	1				Caldwell, Mast
er. Alden Gates	male	0.8333	0	2		
36	2	0				Carbin
es, Mr. William	male	19.0000	0	0		
37	2	1				Collyer, Miss. Ma
rjorie "Lottie"	female	8.0000	0	2		
38	2	1				Davies, Master.
John Morgan Jr	male	8.0000	1	1		
39	2	0				Davies, Mr
. Charles Henry	male	18.0000	0	0		
40	2	0				Deacon, Mr
. Percy William	male	17.0000	0	0		
41	2	0				Dibd
en, Mr. William	male	18.0000	0	0		
42	2	1				Doli
ng, Miss. Elsie	female	18.0000	0	1		
43	2	1				Drew, Master.
Marshall Brines	male	8.0000	0	2		
44	2	0				Fahlstrom,
Mr. Arne Jonas	male	18.0000	0	0		
45	2	0				Fillbrook, Mr.
Joseph Charles	male	18.0000	0	0		
46	2	0				Gask
ell, Mr. Alfred	male	16.0000	0	0		
47	2	1				Hamalainen
, Master. Viljo	male	0.6667	1	1		
48	2	1				Harper, Miss. Anni
e Jessie "Nina"	female	6.0000	0	1		
49	2	1				Hart, M
iss. Eva Miriam	female	7.0000	0	2		
50	2	0				Hiltun
en, Miss. Marta	female	18.0000	1	1		
51	2	1				Ilet
t, Miss. Bertha	female	17.0000	0	0		
52	2	1				Laroch
e, Miss. Louise	female	1.0000	1	2		
53	2	1				Laroche, Miss. Simonne Ma
rie Anne Andree	female	3.0000	1	2		
54	2	1				Lehman
n, Miss. Bertha	female	17.0000	0	0		
55	2	1				Mallet
, Master. Andre	male	1.0000	0	2		
56	2	1				Mellinger, Miss. M
adeleine Violet	female	13.0000	0	1		
57	2	1				Mellors, M
r. William John	male	19.0000	0	0		
58	2	0				Mudd, Mr.
Thomas Charles	male	16.0000	0	0		

59	2	1					Nasser, Mrs. Nichola
s (Adele Achem)	female	14.0000	1	0			
60	2	1					Navratil, Maste
r. Edmond Roger	male	2.0000	1	1			
61	2	1					Navratil, M
aster. Michel M	male	3.0000	1	1			
62	2	0					Nicholls, Mr.
Joseph Charles	male	19.0000	1	1			
63	2	0					Pengelly, Mr. Fr
ederick William	male	19.0000	0	0			
64	2	1	Phillips,	Miss. Kate Florence ("Mrs Kate Louise Phil			
lips Marshall")	female	19.0000	0	0			
65	2	1					Quick, Mi
ss. Phyllis May	female	2.0000	1	1			
66	2	1					Quick, Miss
. Winifred Vera	female	8.0000	1	1			
67	2	1					Richards, Master
. George Sibley	male	0.8333	1	1			
68	2	1					Richards, Maste
r. William Rowe	male	3.0000	1	1			
69	2	0					Rogers, Mr.
Reginald Harry	male	19.0000	0	0			
70	2	1					Silven, Miss.
Lyyli Karoliina	female	18.0000	0	2			
71	2	0					Sw
ane, Mr. George	male	18.5000	0	0			
72	2	0					Sweet, Mr. G
George Frederick	male	14.0000	0	0			
73	2	1					Watt,
Miss. Bertha J	female	12.0000	0	0			
74	2	1					Wells, Maste
r. Ralph Lester	male	2.0000	1	1			
75	2	1					We
lls, Miss. Joan	female	4.0000	1	1			
76	2	1					West,
Miss. Barbara J	female	0.9167	1	2			
77	2	1					West, Miss. C
onstance Mirium	female	5.0000	1	2			
78	3	0					Abbott, Master
. Eugene Joseph	male	13.0000	0	2			
79	3	0					Abbott, Mr.
Rossmore Edward	male	16.0000	1	1			
80	3	1					Abelseth, Mi
ss. Karen Marie	female	16.0000	0	0			
81	3	1					Abraham, Mrs. Joseph (Soph
ie Halaut Easu)	female	18.0000	0	0			
82	3	1					Aks, Maste
r. Philip Frank	male	0.8333	0	1			
83	3	1					Aks, Mrs. S
am (Leah Rosen)	female	18.0000	0	1			
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1	113781	151.5500		C22 C26	S	11	
2	113781	151.5500		C22 C26	S	<NA>	
3	PC 17757	227.5250		C62 C64	C	4	
4	11967	91.0792		B49	C	7	
5	113059	47.1000		<NA>	S	<NA>	
6	113760	120.0000		B96 B98	S	4	
7	113760	120.0000		B96 B98	S	4	
8	17474	57.0000		B20	S	3	
9	33638	81.8583		A34	S	5	
10	19950	263.0000	C23 C25	C27	S	<NA>	
11	112053	30.0000		B42	S	3	
12	111361	57.9792		B18	C	4	
13	PC 17592	39.4000		D28	S	9	
14	24160	211.3375		B5	S	2	
15	110152	86.5000		B79	S	8	
16	113773	53.1000		D30	S	<NA>	
17	113773	53.1000		D30	S	10	
18	11752	26.2833		D47	S	5	
19	PC 17758	108.9000		C65	C	<NA>	
20	PC 17758	108.9000		C65	C	8	
21	PC 17608	262.3750	B57 B59 B63	B66	C	4	
22	PC 17608	262.3750	B57 B59 B63	B66	C	4	
23	13695	60.0000		C31	S	6	
24	16966	134.5000		E34	C	3	
25	110413	79.6500		E68	S	8	



26	17421	110.8833	C70	C	B
27	231945	11.5000	<NA>	S	<NA>
28	29108	11.5000	<NA>	S	<NA>
29	2908	26.0000	<NA>	S	13
30	230136	39.0000	F4	S	11
31	230136	39.0000	F4	S	11
32	230136	39.0000	F4	S	13
33	28404	13.0000	<NA>	S	12
34	29750	39.0000	<NA>	S	14
35	248738	29.0000	<NA>	S	13
36	28424	13.0000	<NA>	S	<NA>
37	C.A. 31921	26.2500	<NA>	S	14
38	C.A. 33112	36.7500	<NA>	S	14
39	S.O.C. 14879	73.5000	<NA>	S	<NA>
40	S.O.C. 14879	73.5000	<NA>	S	<NA>
41	S.O.C. 14879	73.5000	<NA>	S	<NA>
42	231919	23.0000	<NA>	S	<NA>
43	28220	32.5000	<NA>	S	10
44	236171	13.0000	<NA>	S	<NA>
45	C.A. 15185	10.5000	<NA>	S	<NA>
46	239865	26.0000	<NA>	S	<NA>
47	250649	14.5000	<NA>	S	4
48	248727	33.0000	<NA>	S	11
49	F.C.C. 13529	26.2500	<NA>	S	14
50	250650	13.0000	<NA>	S	<NA>
51	SO/C 14885	10.5000	<NA>	S	<NA>
52	SC/Paris 2123	41.5792	<NA>	C	14
53	SC/Paris 2123	41.5792	<NA>	C	14
54	SC 1748	12.0000	<NA>	C	12
55	S.C./PARIS 2079	37.0042	<NA>	C	10
56	250644	19.5000	<NA>	S	14
57	SW/PP 751	10.5000	<NA>	S	B
58	S.O./P.P. 3	10.5000	<NA>	S	<NA>
59	237736	30.0708	<NA>	C	<NA>
60	230080	26.0000	F2	S	D
61	230080	26.0000	F2	S	D
62	C.A. 33112	36.7500	<NA>	S	<NA>
63	28665	10.5000	<NA>	S	<NA>
64	250655	26.0000	<NA>	S	11
65	26360	26.0000	<NA>	S	11
66	26360	26.0000	<NA>	S	11
67	29106	18.7500	<NA>	S	4
68	29106	18.7500	<NA>	S	4
69	28004	10.5000	<NA>	S	<NA>
70	250652	13.0000	<NA>	S	16
71	248734	13.0000	F	S	<NA>
72	220845	65.0000	<NA>	S	<NA>
73	C.A. 33595	15.7500	<NA>	S	9
74	29103	23.0000	<NA>	S	14
75	29103	23.0000	<NA>	S	14
76	C.A. 34651	27.7500	<NA>	S	10
77	C.A. 34651	27.7500	<NA>	S	10
78	C.A. 2673	20.2500	<NA>	S	<NA>
79	C.A. 2673	20.2500	<NA>	S	<NA>
80	348125	7.6500	<NA>	S	16
81	2657	7.2292	<NA>	C	C
82	392091	9.3500	<NA>	S	11
83	392091	9.3500	<NA>	S	13

```
[ reached 'max' / getOption("max.print") -- omitted 142 rows ]
```

```
> mutated_DF <- mutate(DF, fare = fare * 2)
```

```
> mutated_DF$fare
```

[1]	422.6750	303.1000	303.1000	303.1000	303.1000	53.1000	155.9166	0.0000
102.9584	99.0084	455.0500	455.0500	138.6000				
[14]	157.7000	60.0000	51.8500	495.0416	495.0416	152.5834	150.4834	105.1084
105.1084	60.0000	455.0500	443.5584	52.0000				
[27]	182.1584	182.1584	271.2666	53.1000	71.0000	62.0000	329.7334	53.1000
53.1000	524.7500	110.0000	53.1000	61.0000				
[40]	100.9916	79.2000	55.4416	102.9584	152.5834	269.0000	53.1000	62.0000
52.5750	54.8916	1024.6584	1024.6584	10.0000				
[53]	94.2000	94.2000	240.0000	240.0000	240.0000	240.0000	52.0000	55.4416
157.7000	157.7000	122.3500	122.3500	106.2000				
[66]	106.2000	524.7500	173.0000	59.4000	110.0000	0.0000	273.5584	273.5584
303.1000	104.0000	51.1750	166.3166	166.3166				
[79]	166.3166	51.4000	53.1000	142.0000	142.0000	53.1000	142.5666	142.5666
53.1000	61.0000	303.1000	104.0000	104.0000				

[92]	114.0000	114.0000	163.7166	163.7166	163.7166	212.8500	495.0416	212.8500
79.2000	113.8584	59.4000	166.3166	455.0500				
[105]	156.5334	63.3584	443.5584	63.3666	221.7666	52.7750	55.5000	526.0000
526.0000	526.0000	526.0000	526.0000	526.0000				
[118]	113.8584	53.1000	267.3000	55.4416	267.3000	99.0000	158.4000	158.4000
0.0000	106.2000	106.2000	77.0000	423.0000				
[131]	118.8000	118.8000	158.4000	178.2084	178.2084	69.3084	57.0000	60.0000
306.9250	306.9250	126.7166	126.7166	158.4000				
[144]	110.8834	110.8834	153.4584	153.4584	84.8000	166.9500	166.9500	0.0000
153.4584	60.0000	166.3166	187.0000	187.0000				
[157]	85.0000	103.7250	100.0000	115.9584	115.9584	155.9166	104.0000	104.0000
53.1000	180.0000	61.3916	180.0000	160.0000				
[170]	57.4250	0.0000	52.0000	52.0000	423.0000	59.4000	103.7250	103.7250
105.1084	105.1084	53.1000	422.6750	51.8584				
[183]	212.8500	1024.6584	55.4416	53.1000	55.4416	78.8000	78.8000	60.0000
155.9166	91.0000	293.0416	422.6750	52.0000				
[196]	173.0000	59.4000	106.2000	106.2000	99.0084	150.4834	103.7250	52.5750
164.3416	164.3416	53.1000	180.0000	180.0000				
[209]	180.0000	115.5000	61.0000	84.8000	59.4000	226.5500	226.5500	226.5500
52.5666	52.0000	217.8000	51.4834	123.9584				
[222]	123.9584	55.4416	0.0000	57.0000	187.0000	133.2000	133.2000	217.8000
217.8000	187.0000	61.0000	104.0000	166.3166				
[235]	0.0000	79.2000	271.2666	455.0500	422.6750	100.9916	53.1000	100.0000
55.4416	158.4000	80.2500	173.0000	118.8000				
[248]	118.8000	53.1000	524.7500	524.7500	524.7500	524.7500	524.7500	61.0000
138.6000	52.0000	115.5000	62.0000	53.1000				
[261]	306.9250	52.5750	111.8000	111.8000	71.0000	71.0000	53.1000	61.3916
120.0000	52.0000	120.0000	164.5334	164.5334				
[274]	269.0000	269.0000	269.0000	293.0416	293.0416	61.0000	53.1000	110.8834
110.8834	156.5334	55.4416	160.0000	443.5584				
[287]	443.5584	64.6416	51.8584	159.3000	159.3000	159.3000	104.0000	104.0000
221.7666	221.7666	221.7666	158.4000	57.0750				
[300]	55.4416	67.0000	68.0416	1024.6584	150.5000	150.5000	53.1000	154.5750
154.5750	271.2666	329.7334	329.7334	329.7334				
[313]	423.0000	423.0000	423.0000	53.1000	12.7584	122.7584	70.0000	269.0000
71.0000	53.1000	271.2666	48.0000	48.0000				
[326]	26.0000	23.0000	21.0000	52.0000	52.0000	26.0000	23.0000	21.0000
26.0000	21.0000	25.0500	52.0000	52.0000				
[339]	52.0000	78.0000	78.0000	78.0000	78.0000	26.0000	26.0000	26.0000
26.0000	26.0000	26.0000	26.0000	78.0000				
[352]	78.0000	78.0000	52.0000	52.0000	26.0000	26.0000	26.0000	26.0000
58.0000	58.0000	58.0000	42.0000	0.0000				
[365]	26.0000	52.0000	52.0000	27.0000	52.0000	52.0000	60.0000	60.0000
52.0000	52.0000	21.0000	26.0000	21.0000				
[378]	52.5000	52.5000	52.5000	21.0000	26.0000	42.0000	23.0000	0.0000
73.5000	147.0000	73.5000	26.0000	26.0000				
[391]	147.0000	55.4416	55.4416	63.0000	7.0000	46.0000	46.0000	52.0000
65.0000	65.0000	65.0000	27.7166	27.7166				
[404]	26.0000	26.0000	26.0000	52.0000	52.0000	21.0000	26.0000	0.0000
26.0000	52.0000	42.0000	42.0000	26.0000				
[417]	52.0000	21.0000	21.0000	23.0000	23.0000	27.0000	26.0000	26.0000
26.0000	26.0000	26.0000	29.0000	29.0000				
[430]	26.0000	66.0000	66.0000	21.0000	21.0000	52.5000	52.5000	52.5000
130.0000	130.0000	130.0000	130.0000	32.0000				
[443]	147.0000	147.0000	147.0000	26.0000	46.0000	23.0000	26.0000	46.0000
26.0000	52.0000	52.0000	147.0000	26.0000				
[456]	52.0000	52.0000	24.5500	21.0000	54.0000	54.0000	30.0000	63.0000
63.0000	21.0000	27.5834	52.0000	52.0000				
[469]	42.0000	24.7000	24.7000	27.0000	24.7000	0.0000	21.0000	52.0000
52.0000	21.4166	83.1584	83.1584	83.1584				
[482]	83.1584	24.0000	66.0000	21.0000	25.7500	21.0000	24.7000	52.0000
52.0000	21.0000	30.0916	74.0084	74.0084				
[495]	74.0084	31.1584	26.0000	32.0000	27.0000	26.0000	52.0000	39.0000
39.0000	21.0000	26.0000	26.0000	21.0000				
[508]	26.0000	28.0000	52.0000	21.0000	19.3750	60.1416	60.1416	52.0000
52.0000	52.0000	26.0000	73.5000	27.0000				
[521]	27.7250	21.0000	26.0000	21.0000	27.7250	21.0000	27.7166	21.0000
0.0000	52.0000	21.0000	30.1000	26.0000				
[534]	42.0000	52.0000	42.0000	26.0000	26.0000	25.4750	30.0666	52.0000
52.0000	52.0000	21.0000	42.0000	42.0000				
[547]	26.0000	30.0916	37.5000	37.5000	37.5000	21.0000	21.0000	21.0000
26.0000	26.0000	52.0000	52.0000	26.0000				
[560]	73.5000	26.0000	27.0000	24.7000	21.0000	26.0000	26.0000	30.0916
21.0000	26.0000	130.0000	21.0000	26.0000				
[573]	25.3000	21.0000	42.0000	42.0000	26.0000	42.0000	42.0000	21.0000
42.0000	0.0000	31.5000	31.5000	26.0000				

```

[586] 52.0000 52.0000 46.0000 46.0000 46.0000 55.5000 55.5000 55.5000
55.5000 21.0000 25.7500 26.0000 26.0000
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15.8500 14.4584 14.5000 16.1000 18.9500
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16.6000 45.0500 15.7084 62.5500 62.5500
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62.5500 15.7084 15.7916 35.6000 35.6000
[638] 15.5500 14.1000 62.7750 62.7750 62.7750 62.7750 62.7750 62.7750
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[651] 28.9166 14.4500 15.7084 14.4584 14.4500 31.7000 31.7000 38.5166
38.5166 38.5166 38.5166 16.1000 14.4500
[664] 15.7916 14.4584 28.9084 28.9084 15.7584 16.1000 16.1000 15.5500
18.7000 14.4584 8.0250 112.9916 15.5500
[677] 15.5000 15.7916 30.4916 30.4916 14.4500 30.4916 15.5000 31.0000
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[690] 14.5000 15.5916 16.1000 14.5666 15.6416 13.5000 15.7584 17.3250
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15.7916 112.9916 112.9916 14.5000 15.5000
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50.9334 50.9334 15.8500 12.8750 31.0000
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15.8500 15.7584 112.9916 15.1000 32.2000
[976] 32.2000 15.7584 14.5000 17.3250 14.1084 15.7084 15.1584 15.7916
15.1000 15.5000 14.2834 14.2500 15.7584
[989] 15.5000 16.1000 15.8500 14.4584 15.5000 15.4750 14.4584 15.7916
15.7916 14.4500 15.7916 15.5000
[ reached getOption("max.print") -- omitted 309 entries ]
> missing_DF <- sum(is.na(DF$boat))
> missing_DF
[1] 823
> per_missing_DF <- mean(is.na(DF$boat)) * 100
> per_missing_DF
[1] 62.87242
> complete_DF <- na.omit(DF$boat)
> complete_DF
[1] "2" "11" "3" "10" "D" "4" "9" "6"
"B" "6" "8" "A" "5"

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[14]	"5"	"5"	"4"	"8"	"7"	"7"	"8"	"D"								
"7"	"8"	"8"	"4"	"6"												
[27]	"9"	"6"	"D"	"8"	"3"	"5"	"6"	"3"								
"3"	"4"	"4"	"C"	"4"	"5"	"4"	"8"	"7"								
[40]	"5"	"6"	"4"	"5"	"5"	"4"	"8"	"7"								
"6"	"4"	"11"	"14"	"14"												
[53]	"2"	"7"	"7"	"4"	"5 9"	"3"	"8"	"3"								
"3"	"3"	"13"	"5"	"5"												
[66]	"6"	"2"	"1"	"1"	"7"	"4"	"4"	"7"								
"4"	"5"	"10"	"10"	"10"												
[79]	"10"	"1"	"5"	"5"	"5"	"5"	"5"	"5"								
"D"	"4"	"7"	"7"	"5"												
[92]	"5"	"B"	"3"	"3"	"7"	"7"	"5"	"5"								
"3"	"3"	"D"	"3"	"3"												
[105]	"7"	"3"	"4"	"4"	"10"	"8"	"15"	"D"								
"14"	"D"	"6"	"C"	"8"												
[118]	"5"	"5"	"2"	"8"	"2"	"3"	"6"	"9"								
"9"	"10"	"2"	"8"	"7"												
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"6"	"5"	"8"	"7"	"5"												
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"11"	"8"	"6"	"4"	"4"												
[157]	"4"	"4"	"3"	"9"	"1"	"11"	"4"	"7"								
"3"	"5"	"11"	"3"	"7"												
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"1"	"5"	"4"	"6"	"8"												
[183]	"8"	"8"	"5 7"	"5 7"	"B"	"4"	"D"	"7"								
"3"	"5"	"8"	"8"	"8"												
[196]	"4"	"8 10"	"A"	"3"	"D"	"8"	"10"	"11"								
"10"	"13"	"13"	"11"	"11"												
[209]	"13"	"11"	"13"	"12"	"11"	"14"	"14"	"12"								
"9"	"13"	"13"	"13"	"14"	"14"	"14"	"14"	"14"								
[222]	"12"	"12"	"14"	"9"	"14"	"14"	"14"	"14"								
"14"	"13"	"12"	"10"	"10"												
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"14"	"14"	"9"	"9"	"9"												
[248]	"13"	"4"	"4"	"10"	"10"	"12"	"11"	"12"								
"10"	"9"	"14"	"14"	"14"												
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"D"	"D"	"7"	"11"	"13"												
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"11"	"11"	"12"	"9"	"4"												
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"13"	"9"	"9"	"16"	"14"												
[300]	"10"	"9"	"9"	"12"	"10"	"14"	"14"	"14"								
"10"	"10"	"10"	"9"	"14"												
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"15"	"16"	"D"	"A"	"15"												
[326]	"15"	"13"	"15"	"C"	"C"	"C"	"C"	"C"								
"C"	"C"	"C"	"15"	"C"	"C"											
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"2"	"12"	"15"	"15"	"13 15 B"												
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"B"	"13"	"D"	"16"	"13"												
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"2"	"2"	"10"	"C"	"13"												
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"15"	"13"	"15"	"16"	"C"												
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"14"	"14"	"16"	"B"	"C"												
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"13"	"A"	"15"	"C"	"D"												
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"10"	"15"	"C"	"C"	"C"												
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1284 1285 1286 1288 1289 1290 1291 1292 1293 1294 1295
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attr(,"class")
[1] "omit"
> complete_DF <- na.omit(DF$boat)
> complete_DF
[1] "2" "11" "3" "10" "D" "4" "9" "6"
"B" "6" "8" "A" "5"
[14] "5" "5" "4" "8" "7" "7" "8" "D"
"7" "8" "8" "4" "6"
[27] "9" "6" "D" "8" "3" "5" "6" "3"
"3" "4" "4" "C" "4" "5" "4" "8" "7"
[40] "5" "6" "4" "11" "14" "14"
"6" "4" "11" "14"
[53] "2" "7" "7" "4" "5 9" "3" "8" "3"
"3" "3" "13" "5" "5"
[66] "6" "2" "1" "1" "7" "4" "4" "7"
"4" "5" "10" "10" "10"

```

[79]	"10"	"1"	"5"	"5"	"5"	"5"	"5"	"5"	"5"	"5"
"D"	"4"	"7"	"7"	"5"	"7"	"7"	"5"	"7"	"7"	"5"
[92]	"5"	"B"	"3"	"3"	"3"	"3"	"3"	"7"	"7"	"5"
"3"	"3"	"D"	"3"	"3"	"3"	"3"	"3"	"7"	"7"	"5"
[105]	"7"	"3"	"4"	"4"	"4"	"4"	"10"	"8"	"15"	"D"
"14"	"D"	"6"	"C"	"8"	"8"	"8"	"2"	"3"	"6"	"9"
[118]	"5"	"5"	"2"	"8"	"8"	"8"	"2"	"3"	"6"	"9"
"9"	"10"	"2"	"8"	"7"	"6"	"7"	"14"	"14"	"11"	"6"
[131]	"10"	"6"	"7"	"6"	"6"	"5"	"14"	"14"	"11"	"6"
"6"	"5"	"8"	"7"	"7"	"5"	"7"	"A"	"2"	"9"	"9"
[144]	"8"	"8"	"3"	"6"	"7"	"7"	"A"	"2"	"9"	"9"
"11"	"8"	"6"	"4"	"4"	"4"	"4"	"1"	"11"	"4"	"7"
[157]	"4"	"4"	"3"	"9"	"1"	"11"	"4"	"7"	"7"	"7"
"3"	"5"	"11"	"3"	"7"	"3"	"3"	"3"	"6"	"3"	"3"
[170]	"6"	"7"	"7"	"3"	"3"	"3"	"3"	"6"	"3"	"3"
"1"	"5"	"4"	"6"	"8"	"8"	"8"	"B"	"4"	"D"	"7"
[183]	"8"	"8"	"5 7"	"5 7"	"B"	"4"	"D"	"7"	"7"	"7"
"3"	"5"	"8"	"8"	"8"	"8"	"8"	"8"	"10"	"11"	"11"
[196]	"4"	"8 10"	"A"	"3"	"D"	"8"	"10"	"11"	"11"	"11"
"10"	"13"	"13"	"11"	"11"	"11"	"11"	"14"	"14"	"12"	"12"
[209]	"13"	"11"	"13"	"13"	"12"	"11"	"14"	"14"	"12"	"12"
"9"	"13"	"13"	"13"	"13"	"14"	"14"	"14"	"14"	"14"	"14"
[222]	"12"	"12"	"14"	"9"	"14"	"14"	"14"	"14"	"14"	"14"
"14"	"13"	"12"	"10"	"10"	"10"	"4"	"4"	"11"	"15"	"15"
[235]	"12"	"12"	"16"	"12"	"9"	"4"	"4"	"11"	"15"	"15"
"14"	"14"	"9"	"9"	"9"	"9"	"10"	"12"	"11"	"12"	"12"
[248]	"13"	"4"	"4"	"10"	"10"	"12"	"11"	"12"	"12"	"12"
"10"	"9"	"14"	"14"	"14"	"14"	"10"	"12"	"11"	"12"	"12"
[261]	"12"	"11"	"14"	"10"	"10"	"14"	"14"	"14"	"B"	"B"
"D"	"D"	"7"	"11"	"13"	"13"	"11"	"9"	"14"	"11"	"11"
[274]	"9"	"9"	"12"	"12"	"11"	"9"	"14"	"11"	"10"	"10"
"11"	"11"	"12"	"9"	"4"	"12"	"16"	"11"	"10"	"10"	"10"
[287]	"4"	"4"	"13"	"12"	"12"	"16"	"11"	"10"	"10"	"10"
"13"	"9"	"9"	"16"	"14"	"14"	"10"	"14"	"14"	"14"	"14"
[300]	"10"	"9"	"9"	"12"	"10"	"14"	"14"	"14"	"14"	"14"
"10"	"10"	"10"	"9"	"14"	"15"	"C"	"11"	"13"	"13"	"13"
[313]	"9"	"A"	"16"	"A"	"15"	"C"	"11"	"13"	"13"	"13"
"15"	"16"	"D"	"A"	"15"	"C"	"C"	"11"	"13"	"13"	"13"
[326]	"15"	"15"	"C"	"C"	"C"	"C"	"11"	"13"	"13"	"13"
"C"	"C"	"C"	"15"	"C"	"C"	"C"	"11"	"13"	"13"	"13"
[339]	"13"	"13"	"16"	"C"	"12"	"13"	"2"	"2"	"2"	"2"
"2"	"12"	"15"	"15"	"13 15 B"	"10"	"10"	"10"	"10"	"C"	"C"
[352]	"16"	"15"	"13"	"11"	"10"	"10"	"10"	"10"	"C"	"C"
"B"	"13"	"D"	"16"	"13"	"C D"	"C D"	"15"	"11"	"11"	"11"
[365]	"15"	"13"	"16"	"13"	"C"	"C"	"15"	"11"	"11"	"11"
"B"	"16"	"15"	"C"	"C"	"C"	"15"	"A"	"D"	"13"	"13"
[378]	"15"	"15"	"C"	"C"	"15"	"A"	"D"	"13"	"13"	"13"
"15"	"15"	"15"	"15"	"15"	"15"	"16"	"D"	"2"	"2"	"2"
[391]	"15"	"13"	"15"	"15"	"15"	"A"	"16"	"D"	"2"	"2"
"2"	"2"	"10"	"C"	"13"	"15"	"15"	"10"	"15"	"15"	"15"
[404]	"14"	"6"	"A"	"A"	"15"	"15"	"10"	"15"	"15"	"15"
"15"	"13"	"15"	"16"	"C"	"13"	"13"	"15"	"16"	"16"	"16"
[417]	"15 16"	"16"	"16"	"16"	"13"	"13"	"15"	"16"	"16"	"16"
"14"	"14"	"16"	"B"	"C"	"16"	"16"	"C"	"16"	"16"	"16"
[430]	"C"	"C"	"16"	"15"	"16"	"16"	"C"	"16"	"16"	"16"
"C"	"C"	"C"	"C"	"C"	"C"	"C"	"C"	"B"	"13"	"13"
[443]	"D"	"13"	"9"	"13"	"D"	"D"	"C"	"B"	"13"	"13"
"13"	"A"	"15"	"C"	"D"	"14"	"C"	"13"	"13"	"13"	"13"
[456]	"D"	"9"	"13"	"C"	"14"	"C"	"13"	"13"	"13"	"13"
"13"	"11"	"11"	"16"	"13"	"13"	"13"	"13 15"	"16"	"14"	"14"
[469]	"C"	"9"	"B"	"15"	"13"	"13"	"13 15"	"16"	"14"	"14"
"10"	"15"	"C"	"C"	"C"	"C"	"C"	"C"	"C"	"C"	"C"
[482]	"15"	"15"	"13 15"	"C"	"C"	"C"	"C"	"C"	"C"	"C"
attr("na.action")										
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[568] 976 977 978 980 983 984 987 988 989 990 991 993 995 996 997 999
1001 1006 1008 1009 1010 1011 1012 1013 1014 1015 1016
[595] 1017 1019 1020 1021 1022 1023 1025 1028 1030 1031 1032 1033 1038 1039 1042 1046
1047 1052 1053 1054 1055 1056 1059 1060 1063 1064 1066
[622] 1067 1069 1070 1071 1072 1073 1074 1075 1076 1077 1079 1084 1085 1086 1087 1088
1090 1091 1092 1093 1094 1095 1096 1097 1098 1099 1100
[649] 1101 1102 1103 1104 1105 1106 1107 1108 1109 1110 1111 1112 1113 1114 1115 1116
1117 1118 1119 1120 1125 1126 1127 1128 1129 1130 1131
[676] 1133 1134 1135 1136 1137 1138 1139 1140 1141 1142 1143 1144 1145 1146 1147 1148
1149 1151 1152 1153 1154 1155 1156 1157 1158 1159 1161
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1179 1180 1181 1182 1184 1185 1186 1187 1192 1193 1194
[730] 1195 1196 1198 1199 1200 1201 1202 1203 1204 1205 1207 1208 1209 1210 1211 1212
1213 1214 1215 1216 1218 1219 1220 1221 1222 1223 1225
[757] 1226 1227 1228 1230 1231 1232 1235 1236 1238 1240 1242 1243 1244 1246 1247 1249
1250 1251 1252 1253 1254 1256 1260 1263 1264 1265 1266
[784] 1267 1268 1269 1270 1271 1272 1273 1274 1275 1276 1277 1279 1280 1281 1282 1283
1284 1285 1286 1288 1289 1290 1291 1292 1293 1294 1295
[811] 1296 1297 1298 1299 1301 1302 1303 1304 1305 1306 1307 1308 1309
attr(,"class")
[1] "omit"
> column_mean <- mean(DF$survived, na.rm = TRUE)
> column_mean
[1] 0.381971
> complete_rows <- complete.cases(DF)
> complete_rows
[1] TRUE TRUE FALSE FALSE FALSE TRUE TRUE FALSE TRUE FALSE FALSE TRUE TRUE
FALSE TRUE FALSE FALSE TRUE TRUE TRUE TRUE TRUE TRUE
[24] FALSE TRUE FALSE TRUE TRUE TRUE TRUE FALSE TRUE TRUE TRUE FALSE FALSE
TRUE FALSE FALSE FALSE TRUE TRUE TRUE TRUE TRUE FALSE
[47] FALSE TRUE FALSE TRUE TRUE FALSE TRUE TRUE TRUE TRUE TRUE TRUE TRUE
FALSE FALSE TRUE FALSE TRUE TRUE TRUE TRUE TRUE TRUE
[70] FALSE FALSE FALSE TRUE FALSE FALSE FALSE TRUE FALSE TRUE TRUE FALSE FALSE
TRUE TRUE FALSE TRUE TRUE FALSE FALSE FALSE TRUE TRUE
[93] TRUE TRUE TRUE TRUE FALSE TRUE TRUE TRUE TRUE TRUE FALSE TRUE TRUE TRUE
FALSE FALSE FALSE TRUE TRUE FALSE TRUE TRUE TRUE FALSE
[116] FALSE TRUE TRUE FALSE FALSE TRUE FALSE TRUE TRUE TRUE TRUE TRUE TRUE
FALSE TRUE FALSE FALSE FALSE TRUE FALSE FALSE TRUE TRUE
[139] FALSE TRUE TRUE TRUE FALSE TRUE TRUE TRUE TRUE TRUE FALSE FALSE TRUE FALSE
TRUE FALSE TRUE FALSE TRUE FALSE FALSE FALSE TRUE TRUE
[162] TRUE FALSE FALSE FALSE TRUE FALSE TRUE FALSE FALSE TRUE FALSE FALSE
FALSE FALSE FALSE TRUE TRUE FALSE FALSE TRUE FALSE TRUE

```

[illegible]



	pclass	survived					name
Gender	age	sibsp	parch	ticket	fare		
1	1	1					Allen, Miss. Elisabeth Walton
female	29.0000	0	0	24160	211.3375		
2	1	1					Allison, Master. Hudson Trevor
male	0.9167	1	2	113781	151.5500		
6	1	1					Anderson, Mr. Harry
male	48.0000	0	0	19952	26.5500		
7	1	1					Andrews, Miss. Kornelia Theodosia
female	63.0000	1	0	13502	77.9583		
9	1	1					Appleton, Mrs. Edward Dale (Charlotte Lamson)
female	53.0000	2	0	11769	51.4792		
12	1	1					Astor, Mrs. John Jacob (Madeleine Talmadge Force)
female	18.0000	1	0	PC 17757	227.5250		
13	1	1					Aubart, Mme. Leontine Pauline
female	24.0000	0	0	PC 17477	69.3000		
15	1	1					Barkworth, Mr. Algernon Henry Wilson
male	80.0000	0	0	27042	30.0000		
18	1	1					Baxter, Mrs. James (Helene DeLaudeniére Chaput)
female	50.0000	0	1	PC 17558	247.5208		
19	1	1					Bazzani, Miss. Albina
female	32.0000	0	0	11813	76.2917		
20	1	0					Beattie, Mr. Thomson
male	36.0000	0	0	13050	75.2417		
21	1	1					Beckwith, Mr. Richard Leonard
male	37.0000	1	1	11751	52.5542		
22	1	1					Beckwith, Mrs. Richard Leonard (Sallie Monypeny)
female	47.0000	1	1	11751	52.5542		
23	1	1					Behr, Mr. Karl Howell
male	26.0000	0	0	111369	30.0000		
25	1	1					Bird, Miss. Ellen
female	29.0000	0	0	PC 17483	221.7792		
27	1	1					Bishop, Mr. Dickinson H
male	25.0000	1	0	11967	91.0792		
28	1	1					Bishop, Mrs. Dickinson H (Helen Walton)
female	19.0000	1	0	11967	91.0792		
29	1	1					Bissette, Miss. Amelia
female	35.0000	0	0	PC 17760	135.6333		
30	1	1					Bjornstrom-Steffansson, Mr. Mauritz Hakan
male	28.0000	0	0	110564	26.5500		
32	1	1					Blank, Mr. Henry
male	40.0000	0	0	112277	31.0000		
33	1	1					Bonnell, Miss. Caroline
female	30.0000	0	0	36928	164.8667		
34	1	1					Bonnell, Miss. Elizabeth
female	58.0000	0	0	113783	26.5500		
37	1	1					Bowerman, Miss. Elsie Edith
female	22.0000	0	1	113505	55.0000		
42	1	1					Brown, Mrs. James Joseph (Margaret Tobin)
female	44.0000	0	0	PC 17610	27.7208		
43	1	1					Brown, Mrs. John Murray (Caroline Lane Lamson)
female	59.0000	2	0	11769	51.4792		
44	1	1					Bucknell, Mrs. William Robert (Emma Eliza Ward)
female	60.0000	0	0	11813	76.2917		
45	1	1					Burns, Miss. Elizabeth Margaret
female	41.0000	0	0	16966	134.5000		
48	1	1					Calderhead, Mr. Edward Pennington
male	42.0000	0	0	PC 17476	26.2875		
50	1	1					Cardeza, Mr. Thomas Drake Martinez
male	36.0000	0	1	PC 17755	512.3292		
51	1	1					Cardeza, Mrs. James Warburton Martinez (Charlotte Wardle Drake)
female	58.0000	0	1	PC 17755	512.3292		
55	1	1					Carter, Master. William Thornton II
male	11.0000	1	2	113760	120.0000		
56	1	1					Carter, Miss. Lucile Polk
female	14.0000	1	2	113760	120.0000		
57	1	1					Carter, Mr. William Ernest
male	36.0000	1	2	113760	120.0000		
58	1	1					Carter, Mrs. William Ernest (Lucile Polk)
female	36.0000	1	2	113760	120.0000		
62	1	1					Cavendish, Mrs. Tyrell William (Julia Florence Siegel)
female	76.0000	1	0	19877	78.8500		
64	1	1					Chaffee, Mrs. Herbert Fuller (Carrie Constance Toogood)
female	47.0000	1	0	W.E.P. 5734	61.1750		

65	1	1				Chambers, Mr. Norman Campbell
male 27.0000	1	0	113806	53.1000		
66	1	1				Chambers, Mrs. Norman Campbell (Bertha Griggs)
female 33.0000	1	0	113806	53.1000		
67	1	1				Chaudanson, Miss. Victorine
female 36.0000	0	0	PC 17608	262.3750		
68	1	1				Cherry, Miss. Gladys
female 30.0000	0	0	110152	86.5000		
69	1	1				Chevre, Mr. Paul Romaine
male 45.0000	0	0	PC 17594	29.7000		
73	1	1				Clark, Mrs. Walter Miller (Virginia McDowell)
female 26.0000	1	0	13508	136.7792		
77	1	1				Compton, Miss. Sara Rebecca
female 39.0000	1	1	PC 17756	83.1583		
79	1	1				Compton, Mrs. Alexander Taylor (Mary Eliza Ingersoll)
female 64.0000	0	2	PC 17756	83.1583		
80	1	1				Cornell, Mrs. Robert Clifford (Malvina Helen Lamson)
female 55.0000	2	0	11770	25.7000		
83	1	1				Crosby, Miss. Harriet R
female 36.0000	0	2	WE/P 5735	71.0000		
84	1	1				Crosby, Mrs. Edward Gifford (Catherine Elizabeth Halstead)
female 64.0000	1	1	112901	26.5500		
86	1	1				Cummings, Mrs. John Bradley (Florence Briggs Thayer)
female 38.0000	1	0	PC 17599	71.2833		
87	1	1				Daly, Mr. Peter Denis
male 51.0000	0	0	113055	1.5500		
91	1	1				Davidson, Mrs. Thornton (Orian Hays)
female 27.0000	1	2	F.C. 12750	52.0000		
92	1	1				Dick, Mr. Albert Adrian
male 31.0000	1	0	17474	1.0000		
93	1	1				Dick, Mrs. Albert Adrian (Vera Gillespie)
female 17.0000	1	0	17474	57.0000		
94	1	1				Dodge, Dr. Washington
male 53.0000	1	1	33638	81.8583		
95	1	1				Dodge, Master. Washington
male 4.0000	0	2	33638	81.8583		
96	1	1				Dodge, Mrs. Washington (Ruth Vidaver)
female 54.0000	1	1	33638	81.8583		
98	1	1				Douglas, Mrs. Frederick Charles (Mary Helene Baxter)
female 27.0000	1	1	PC 17558	247.5208		
99	1	1				Douglas, Mrs. Walter Donald (Mahala Dutton)
female 48.0000	1	0	PC 17761	106.4250		
100	1	1	Duff Gordon, Lady.	(Lucille Christiana Sutherland) ("Mrs Morgan")		
female 48.0000	1	0	11755	39.6000		
101	1	1				Duff Gordon, Sir. Cosmo Edmund ("Mr Morgan")
male 49.0000	1	0	PC 17485	56.9292		
103	1	1				Earnshaw, Mrs. Boulton (Olive Potter)
female 23.0000	0	1	11767	83.1583		
104	1	1				Endres, Miss. Caroline Louise
female 38.0000	0	0	PC 17757	227.5250		
105	1	1				Eustis, Miss. Elizabeth Mussey
female 54.0000	1	0	36947	78.2667		
110	1	1				Flynn, Mr. John Irwin ("Irving")
male 36.0000	0	0	PC 17474	26.3875		
112	1	1				Fortune, Miss. Alice Elizabeth
female 24.0000	3	2	19950	263.0000		
113	1	1				Fortune, Miss. Ethel Flora
female 28.0000	3	2	19950	263.0000		
114	1	1				Fortune, Miss. Mabel Helen
female 23.0000	3	2	19950	263.0000		
117	1	1				Fortune, Mrs. Mark (Mary McDougald)
female 60.0000	1	4	19950	263.0000		
118	1	1				Francatelli, Miss. Laura Mabel
female 30.0000	0	0	PC 17485	56.9292		
121	1	1				Frauenthal, Mr. Isaac Gerald
male 43.0000	1	0	17765	27.7208		
123	1	1				Frolicher, Miss. Hedwig Margaritha
female 22.0000	0	2	13568	49.5000		
124	1	1				Frolicher-Stehli, Mr. Maxmillian
male 60.0000	1	1	13567	79.2000		
125	1	1				Frolicher-Stehli, Mrs. Maxmillian (Margaretha Emerentia Stehli)
female 48.0000	1	1	13567	79.2000		
128	1	1				Futrelle, Mrs. Jacques Heath (Lily May Peel)
female 35.0000	1	0	113803	53.1000		

130	1	1				Geiger, Miss. Amalie
female	35.0000	0	0	113503	211.5000	
134	1	1				Goldenberg, Mr. Samuel L
male	49.0000	1	0	17453	89.1042	
137	1	1				Gracie, Col. Archibald IV
male	53.0000	0	0	113780	28.5000	
138	1	1				Graham, Miss. Margaret Edith
female	19.0000	0	0	112053	30.0000	
140	1	1				Graham, Mrs. William Thompson (Edith Junkins)
female	58.0000	0	1	PC 17582	153.4625	
141	1	1				Greenfield, Mr. William Bertram
male	23.0000	0	1	PC 17759	63.3583	
142	1	1				Greenfield, Mrs. Leo David (Blanche Strouse)
female	45.0000	0	1	PC 17759	63.3583	
144	1	1				Harder, Mr. George Achilles
male	25.0000	1	0	11765	55.4417	
145	1	1				Harder, Mrs. George Achilles (Dorothy Annan)
female	25.0000	1	0	11765	55.4417	
146	1	1				Harper, Mr. Henry Sleeper
male	48.0000	1	0	PC 17572	76.7292	
	cabin	embarked	boat			
1	B5	S	2			
2	C22 C26	S	11			
6	E12	S	3			
7	D7	S	10			
9	C101	S	D			
12	C62 C64	C	4			
13	B35	C	9			
15	A23	S	B			
18	B58 B60	C	6			
19	D15	C	8			
20	C6	C	A			
21	D35	S	5			
22	D35	S	5			
23	C148	C	5			
25	C97	S	8			
27	B49	C	7			
28	B49	C	7			
29	C99	S	8			
30	C52	S	D			
32	A31	C	7			
33	C7	S	8			
34	C103	S	8			
37	E33	S	6			
42	B4	C	6			
43	C101	S	D			
44	D15	C	8			
45	E40	C	3			
48	E24	S	5			
50	B51 B53 B55	C	3			
51	B51 B53 B55	C	3			
55	B96 B98	S	4			
56	B96 B98	S	4			
57	B96 B98	S	C			
58	B96 B98	S	4			
62	C46	S	6			
64	E31	S	4			
65	E8	S	5			
66	E8	S	5			
67	B61	C	4			
68	B77	S	8			
69	A9	C	7			
73	C89	C	4			
77	E49	C	14			
79	E45	C	14			
80	C101	S	2			
83	B22	S	7			
84	B26	S	7			
86	C85	C	4			
87	E17	S	5 9			
91	B71	S	3			
92	B20	S	3			
93	B20	S	3			
94	A34	S	13			
95	A34	S	5			

```

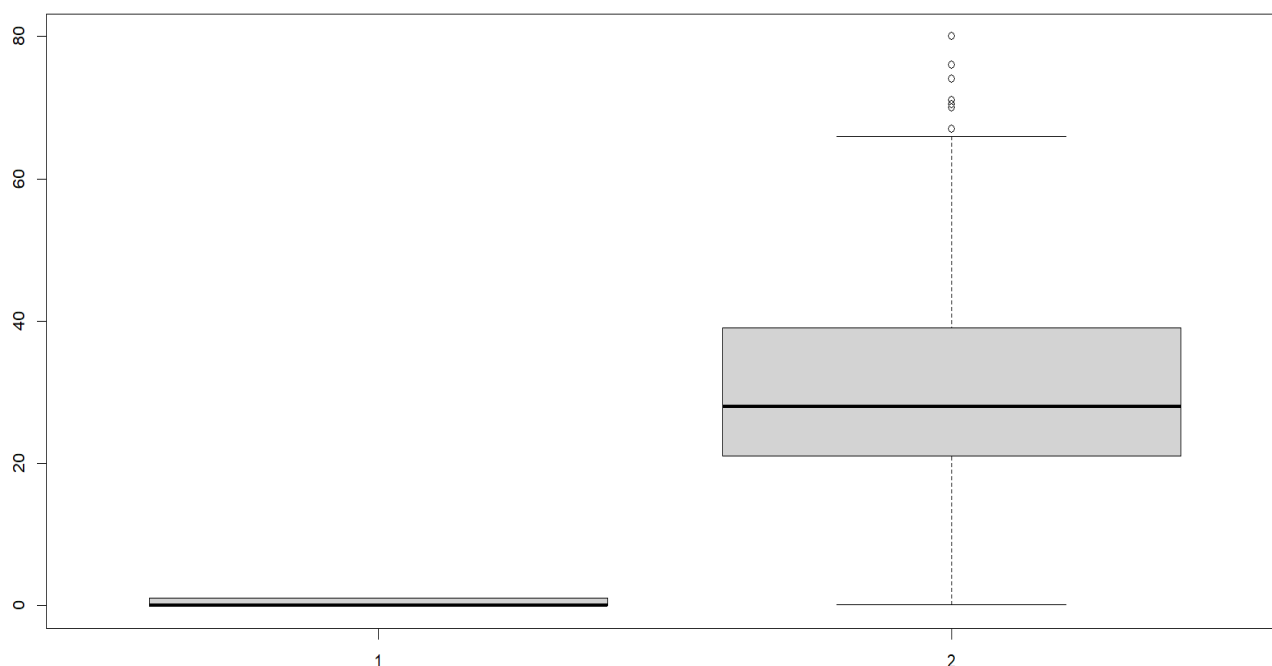
96      A34      S      5
98      B58 B60      C      6
99      C86      C      2
100     A16      C      1
101     A20      C      1
103     C54      C      7
104     C45      C      4
105     D20      C      4
110     E25      S      5
112 C23 C25 C27      S     10
113 C23 C25 C27      S     10
114 C23 C25 C27      S     10
117 C23 C25 C27      S     10
118     E36      C      1
121     D40      C      5
123     B39      C      5
124     B41      C      5
125     B41      C      5
128     C123     S      D
130     C130     C      4
134     C92      C      5
137     C51      C      B
138     B42      S      3
140     C125     S      3
141    D10 D12      C      7
142    D10 D12      C      7
144     E50      C      5
145     E50      C      5
146     D33      C      3

[ reached 'max' / getOption("max.print") -- omitted 97 rows ]
> glimpse(DF)
Rows: 1,309
Columns: 12
$ pclass   <dbl> 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,...
$ survived <dbl> 1, 1, 0, 0, 0, 1, 1, 0, 1, 0, 0, 1, 1, 1, 1, 0, 0, 1, 1, 0, 1, 1, 1,
1, 1, 0, 1, 1, 1, 1, 0, 1, 1, 0, 1, 1, 1, 0, 0, 0, 1,...
$ name     <chr> "Allen, Miss. Elisabeth Walton", "Allison, Master. Hudson Trevor", "
Allison, Miss. Helen Loraine", "Allison, Mr. Hudson Joshu...
$ Gender   <chr> "female", "male", "female", "male", "female", "male", "female", "mal
e", "female", "male", "male", "female", "female", "female...
$ age      <dbl> 29.0000, 0.9167, 2.0000, 30.0000, 25.0000, 48.0000, 63.0000, 39.0000
, 53.0000, 71.0000, 47.0000, 18.0000, 24.0000, 26.0000, 8...
$ sibsp    <dbl> 0, 1, 1, 1, 1, 0, 1, 0, 2, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0,
0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,...
$ parch    <dbl> 0, 2, 2, 2, 2, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 1, 1, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0,...
$ ticket   <chr> "24160", "113781", "113781", "113781", "113781", "19952", "13502", "
112050", "11769", "PC 17609", "PC 17757", "PC 17757", "PC...
$ fare     <dbl> 211.3375, 151.5500, 151.5500, 151.5500, 151.5500, 26.5500, 77.9583,
0.0000, 51.4792, 49.5042, 227.5250, 227.5250, 69.3000, 78...
$ cabin    <chr> "B5", "C22 C26", "C22 C26", "C22 C26", "C22 C26", "E12", "D7", "A36"
, "C101", NA, "C62 C64", "C62 C64", "B35", NA, "A23", NA,...
$ embarked <chr> "S", "S", "S", "S", "S", "S", "S", "S", "S", "S", "C", "C", "C", "C", "S"
, "S", "S", "C", "C", "C", "C", "S", "S", "C", "C", "S", ...
$ boat     <chr> "2", "11", NA, NA, NA, "3", "10", NA, "D", NA, NA, "4", "9", "6", "B
", NA, NA, "6", "8", "A", "5", "5", "5", "5", "4", "8", NA, "7...
> outlier_stats <- boxplot.stats(DF$survived)
> outlier_stats
$stats
[1] 0 0 0 1 1

$n
[1] 1309

$conf
[1] -0.04367041  0.04367041

$out
numeric(0)
> boxplot(DF$survived, DF$age)
```



```
> outlier_limit <- boxplot.stats(DF$age)$out
> outlier_limit
[1] 71.0 80.0 76.0 70.0 71.0 67.0 70.0 70.5 74.0
> value_imputed <- data.frame(
+   original = DF$age,
+   imputed_zero = replace(DF$age, is.na(DF$age), 0),
+   imputed_mean = replace(DF$age, is.na(DF$age), mean(DF$age, na.rm = TRUE)),
+   imputed_median = replace(DF$age, is.na(DF$age), median(DF$age, na.rm = TRUE))
+ )
> value_imputed
  original imputed_zero imputed_mean imputed_median
1    29.0000      29.0000    29.000000      29.0000
2     0.9167       0.9167     0.916700       0.9167
3     2.0000       2.0000     2.000000       2.0000
4    30.0000      30.0000    30.000000      30.0000
5    25.0000      25.0000    25.000000      25.0000
6    48.0000      48.0000    48.000000      48.0000
7    63.0000      63.0000    63.000000      63.0000
8    39.0000      39.0000    39.000000      39.0000
9    53.0000      53.0000    53.000000      53.0000
10   71.0000      71.0000    71.000000      71.0000
11   47.0000      47.0000    47.000000      47.0000
12   18.0000      18.0000    18.000000      18.0000
13   24.0000      24.0000    24.000000      24.0000
14   26.0000      26.0000    26.000000      26.0000
15   80.0000      80.0000    80.000000      80.0000
16      NA         0.0000    29.88113      28.0000
17   24.0000      24.0000    24.000000      24.0000
18   50.0000      50.0000    50.000000      50.0000
19   32.0000      32.0000    32.000000      32.0000
20   36.0000      36.0000    36.000000      36.0000
21   37.0000      37.0000    37.000000      37.0000
22   47.0000      47.0000    47.000000      47.0000
23   26.0000      26.0000    26.000000      26.0000
24   42.0000      42.0000    42.000000      42.0000
25   29.0000      29.0000    29.000000      29.0000
26   25.0000      25.0000    25.000000      25.0000
27   25.0000      25.0000    25.000000      25.0000
28   19.0000      19.0000    19.000000      19.0000
29   35.0000      35.0000    35.000000      35.0000
```

30	28.0000	28.0000	28.00000	28.0000
31	45.0000	45.0000	45.00000	45.0000
32	40.0000	40.0000	40.00000	40.0000
33	30.0000	30.0000	30.00000	30.0000
34	58.0000	58.0000	58.00000	58.0000
35	42.0000	42.0000	42.00000	42.0000
36	45.0000	45.0000	45.00000	45.0000
37	22.0000	22.0000	22.00000	22.0000
38	NA	0.0000	29.88113	28.0000
39	41.0000	41.0000	41.00000	41.0000
40	48.0000	48.0000	48.00000	48.0000
41	NA	0.0000	29.88113	28.0000
42	44.0000	44.0000	44.00000	44.0000
43	59.0000	59.0000	59.00000	59.0000
44	60.0000	60.0000	60.00000	60.0000
45	41.0000	41.0000	41.00000	41.0000
46	45.0000	45.0000	45.00000	45.0000
47	NA	0.0000	29.88113	28.0000
48	42.0000	42.0000	42.00000	42.0000
49	53.0000	53.0000	53.00000	53.0000
50	36.0000	36.0000	36.00000	36.0000
51	58.0000	58.0000	58.00000	58.0000
52	33.0000	33.0000	33.00000	33.0000
53	28.0000	28.0000	28.00000	28.0000
54	17.0000	17.0000	17.00000	17.0000
55	11.0000	11.0000	11.00000	11.0000
56	14.0000	14.0000	14.00000	14.0000
57	36.0000	36.0000	36.00000	36.0000
58	36.0000	36.0000	36.00000	36.0000
59	49.0000	49.0000	49.00000	49.0000
60	NA	0.0000	29.88113	28.0000
61	36.0000	36.0000	36.00000	36.0000
62	76.0000	76.0000	76.00000	76.0000
63	46.0000	46.0000	46.00000	46.0000
64	47.0000	47.0000	47.00000	47.0000
65	27.0000	27.0000	27.00000	27.0000
66	33.0000	33.0000	33.00000	33.0000
67	36.0000	36.0000	36.00000	36.0000
68	30.0000	30.0000	30.00000	30.0000
69	45.0000	45.0000	45.00000	45.0000
70	NA	0.0000	29.88113	28.0000
71	NA	0.0000	29.88113	28.0000
72	27.0000	27.0000	27.00000	27.0000
73	26.0000	26.0000	26.00000	26.0000
74	22.0000	22.0000	22.00000	22.0000
75	NA	0.0000	29.88113	28.0000
76	47.0000	47.0000	47.00000	47.0000
77	39.0000	39.0000	39.00000	39.0000
78	37.0000	37.0000	37.00000	37.0000
79	64.0000	64.0000	64.00000	64.0000
80	55.0000	55.0000	55.00000	55.0000
81	NA	0.0000	29.88113	28.0000
82	70.0000	70.0000	70.00000	70.0000
83	36.0000	36.0000	36.00000	36.0000
84	64.0000	64.0000	64.00000	64.0000
85	39.0000	39.0000	39.00000	39.0000
86	38.0000	38.0000	38.00000	38.0000
87	51.0000	51.0000	51.00000	51.0000
88	27.0000	27.0000	27.00000	27.0000
89	33.0000	33.0000	33.00000	33.0000
90	31.0000	31.0000	31.00000	31.0000
91	27.0000	27.0000	27.00000	27.0000
92	31.0000	31.0000	31.00000	31.0000
93	17.0000	17.0000	17.00000	17.0000
94	53.0000	53.0000	53.00000	53.0000
95	4.0000	4.0000	4.00000	4.0000
96	54.0000	54.0000	54.00000	54.0000
97	50.0000	50.0000	50.00000	50.0000
98	27.0000	27.0000	27.00000	27.0000
99	48.0000	48.0000	48.00000	48.0000
100	48.0000	48.0000	48.00000	48.0000
101	49.0000	49.0000	49.00000	49.0000
102	39.0000	39.0000	39.00000	39.0000
103	23.0000	23.0000	23.00000	23.0000
104	38.0000	38.0000	38.00000	38.0000

105	54.0000	54.0000	54.00000	54.0000
106	36.0000	36.0000	36.00000	36.0000
107	NA	0.0000	29.88113	28.0000
108	NA	0.0000	29.88113	28.0000
109	NA	0.0000	29.88113	28.0000
110	36.0000	36.0000	36.00000	36.0000
111	30.0000	30.0000	30.00000	30.0000
112	24.0000	24.0000	24.00000	24.0000
113	28.0000	28.0000	28.00000	28.0000
114	23.0000	23.0000	23.00000	23.0000
115	19.0000	19.0000	19.00000	19.0000
116	64.0000	64.0000	64.00000	64.0000
117	60.0000	60.0000	60.00000	60.0000
118	30.0000	30.0000	30.00000	30.0000
119	NA	0.0000	29.88113	28.0000
120	50.0000	50.0000	50.00000	50.0000
121	43.0000	43.0000	43.00000	43.0000
122	NA	0.0000	29.88113	28.0000
123	22.0000	22.0000	22.00000	22.0000
124	60.0000	60.0000	60.00000	60.0000
125	48.0000	48.0000	48.00000	48.0000
126	NA	0.0000	29.88113	28.0000
127	37.0000	37.0000	37.00000	37.0000
128	35.0000	35.0000	35.00000	35.0000
129	47.0000	47.0000	47.00000	47.0000
130	35.0000	35.0000	35.00000	35.0000
131	22.0000	22.0000	22.00000	22.0000
132	45.0000	45.0000	45.00000	45.0000
133	24.0000	24.0000	24.00000	24.0000
134	49.0000	49.0000	49.00000	49.0000
135	NA	0.0000	29.88113	28.0000
136	71.0000	71.0000	71.00000	71.0000
137	53.0000	53.0000	53.00000	53.0000
138	19.0000	19.0000	19.00000	19.0000
139	38.0000	38.0000	38.00000	38.0000
140	58.0000	58.0000	58.00000	58.0000
141	23.0000	23.0000	23.00000	23.0000
142	45.0000	45.0000	45.00000	45.0000
143	46.0000	46.0000	46.00000	46.0000
144	25.0000	25.0000	25.00000	25.0000
145	25.0000	25.0000	25.00000	25.0000
146	48.0000	48.0000	48.00000	48.0000
147	49.0000	49.0000	49.00000	49.0000
148	NA	0.0000	29.88113	28.0000
149	45.0000	45.0000	45.00000	45.0000
150	35.0000	35.0000	35.00000	35.0000
151	40.0000	40.0000	40.00000	40.0000
152	27.0000	27.0000	27.00000	27.0000
153	NA	0.0000	29.88113	28.0000
154	24.0000	24.0000	24.00000	24.0000
155	55.0000	55.0000	55.00000	55.0000
156	52.0000	52.0000	52.00000	52.0000
157	42.0000	42.0000	42.00000	42.0000
158	NA	0.0000	29.88113	28.0000
159	55.0000	55.0000	55.00000	55.0000
160	16.0000	16.0000	16.00000	16.0000
161	44.0000	44.0000	44.00000	44.0000
162	51.0000	51.0000	51.00000	51.0000
163	42.0000	42.0000	42.00000	42.0000
164	35.0000	35.0000	35.00000	35.0000
165	35.0000	35.0000	35.00000	35.0000
166	38.0000	38.0000	38.00000	38.0000
167	NA	0.0000	29.88113	28.0000
168	35.0000	35.0000	35.00000	35.0000
169	38.0000	38.0000	38.00000	38.0000
170	50.0000	50.0000	50.00000	50.0000
171	49.0000	49.0000	49.00000	49.0000
172	46.0000	46.0000	46.00000	46.0000
173	50.0000	50.0000	50.00000	50.0000
174	32.5000	32.5000	32.50000	32.5000
175	58.0000	58.0000	58.00000	58.0000
176	41.0000	41.0000	41.00000	41.0000
177	NA	0.0000	29.88113	28.0000
178	42.0000	42.0000	42.00000	42.0000
179	45.0000	45.0000	45.00000	45.0000

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180      NA      0.0000      29.88113      28.0000
181 39.0000      39.0000      39.00000      39.0000
182 49.0000      49.0000      49.00000      49.0000
183 30.0000      30.0000      30.00000      30.0000
184 35.0000      35.0000      35.00000      35.0000
185      NA      0.0000      29.88113      28.0000
186 42.0000      42.0000      42.00000      42.0000
187 55.0000      55.0000      55.00000      55.0000
188 16.0000      16.0000      16.00000      16.0000
189 51.0000      51.0000      51.00000      51.0000
190 29.0000      29.0000      29.00000      29.0000
191 21.0000      21.0000      21.00000      21.0000
192 30.0000      30.0000      30.00000      30.0000
193 58.0000      58.0000      58.00000      58.0000
194 15.0000      15.0000      15.00000      15.0000
195 30.0000      30.0000      30.00000      30.0000
196 16.0000      16.0000      16.00000      16.0000
197      NA      0.0000      29.88113      28.0000
198 19.0000      19.0000      19.00000      19.0000
199 18.0000      18.0000      18.00000      18.0000
200 24.0000      24.0000      24.00000      24.0000
201 46.0000      46.0000      46.00000      46.0000
202 54.0000      54.0000      54.00000      54.0000
203 36.0000      36.0000      36.00000      36.0000
204 28.0000      28.0000      28.00000      28.0000
205      NA      0.0000      29.88113      28.0000
206 65.0000      65.0000      65.00000      65.0000
207 44.0000      44.0000      44.00000      44.0000
208 33.0000      33.0000      33.00000      33.0000
209 37.0000      37.0000      37.00000      37.0000
210 30.0000      30.0000      30.00000      30.0000
211 55.0000      55.0000      55.00000      55.0000
212 47.0000      47.0000      47.00000      47.0000
213 37.0000      37.0000      37.00000      37.0000
214 31.0000      31.0000      31.00000      31.0000
215 23.0000      23.0000      23.00000      23.0000
216 58.0000      58.0000      58.00000      58.0000
217 19.0000      19.0000      19.00000      19.0000
218 64.0000      64.0000      64.00000      64.0000
219 39.0000      39.0000      39.00000      39.0000
220      NA      0.0000      29.88113      28.0000
221 22.0000      22.0000      22.00000      22.0000
222 65.0000      65.0000      65.00000      65.0000
223 28.5000      28.5000      28.50000      28.5000
224      NA      0.0000      29.88113      28.0000
225 45.5000      45.5000      45.50000      45.5000
226 23.0000      23.0000      23.00000      23.0000
227 29.0000      29.0000      29.00000      29.0000
228 22.0000      22.0000      22.00000      22.0000
229 18.0000      18.0000      18.00000      18.0000
230 17.0000      17.0000      17.00000      17.0000
231 30.0000      30.0000      30.00000      30.0000
232 52.0000      52.0000      52.00000      52.0000
233 47.0000      47.0000      47.00000      47.0000
234 56.0000      56.0000      56.00000      56.0000
235 38.0000      38.0000      38.00000      38.0000
236      NA      0.0000      29.88113      28.0000
237 22.0000      22.0000      22.00000      22.0000
238      NA      0.0000      29.88113      28.0000
239 43.0000      43.0000      43.00000      43.0000
240 31.0000      31.0000      31.00000      31.0000
241 45.0000      45.0000      45.00000      45.0000
242      NA      0.0000      29.88113      28.0000
243 33.0000      33.0000      33.00000      33.0000
244 46.0000      46.0000      46.00000      46.0000
245 36.0000      36.0000      36.00000      36.0000
246 33.0000      33.0000      33.00000      33.0000
247 55.0000      55.0000      55.00000      55.0000
248 54.0000      54.0000      54.00000      54.0000
249 33.0000      33.0000      33.00000      33.0000
250 13.0000      13.0000      13.00000      13.0000

[ reached 'max' / getOption("max.print") -- omitted 1059 rows ]
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