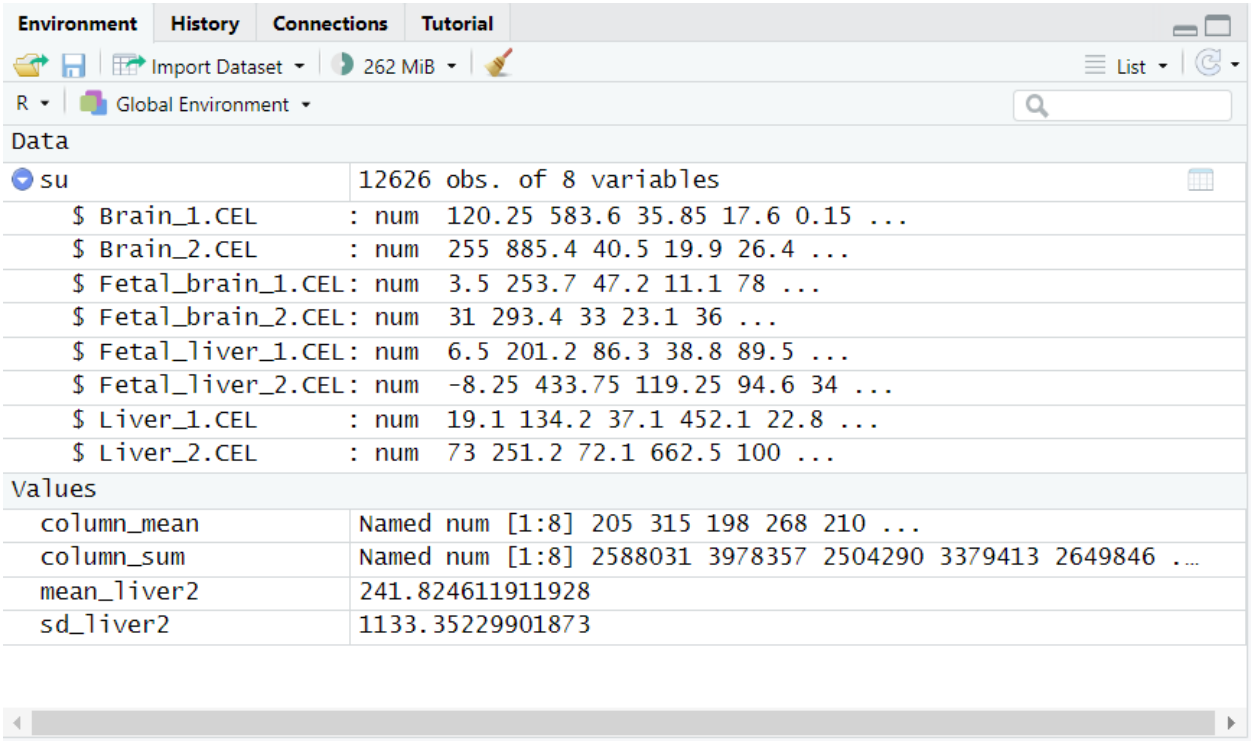
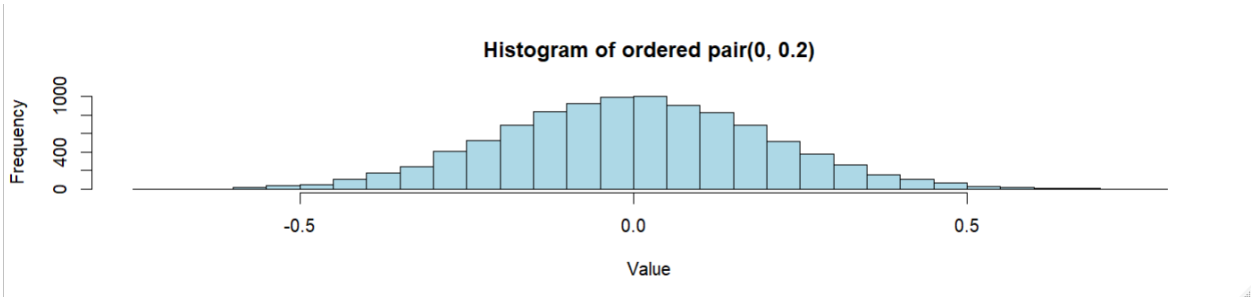
Part 1 Screenshots:

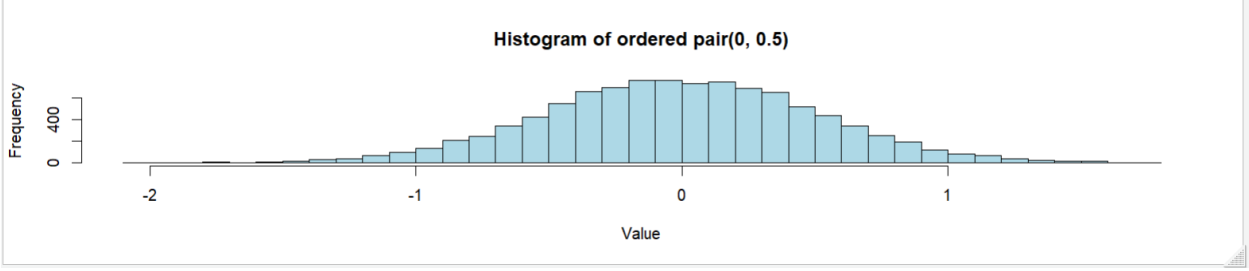
```
> print(mean_liver2)
[1] 241.8246
> print(sd_liver2)
Error: object 'sd_liver2' not found
> # standard deviation function
> sd_liver2 <- sd(su$Liver_2.CEL, na.rm = TRUE)
> print(sd_liver2)
[1] 1133.352
```

```
> print(column_mean)
      Brain_1.CEL       Brain_2.CEL Fetal_brain_1.CEL Fetal_brain_2.CEL Fetal_liver_1.CEL
         204.9763          315.0924          198.3439          267.6551          209.8722
Fetal_liver_2.CEL       Liver_1.CEL       Liver_2.CEL
         399.1482          160.8558          241.8246
> print(column_sum)
      Brain_1.CEL       Brain_2.CEL Fetal_brain_1.CEL Fetal_brain_2.CEL Fetal_liver_1.CEL
           2588031           3978357           2504290           3379413           2649846
Fetal_liver_2.CEL       Liver_1.CEL       Liver_2.CEL
           5039645           2030966           3053278
> |
```

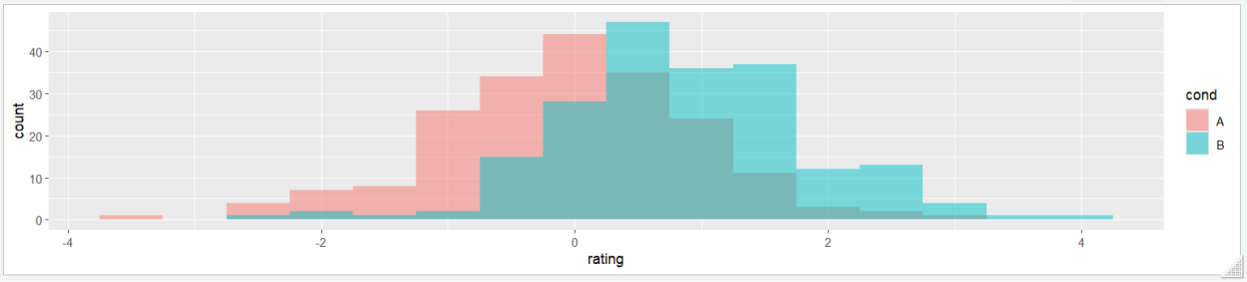


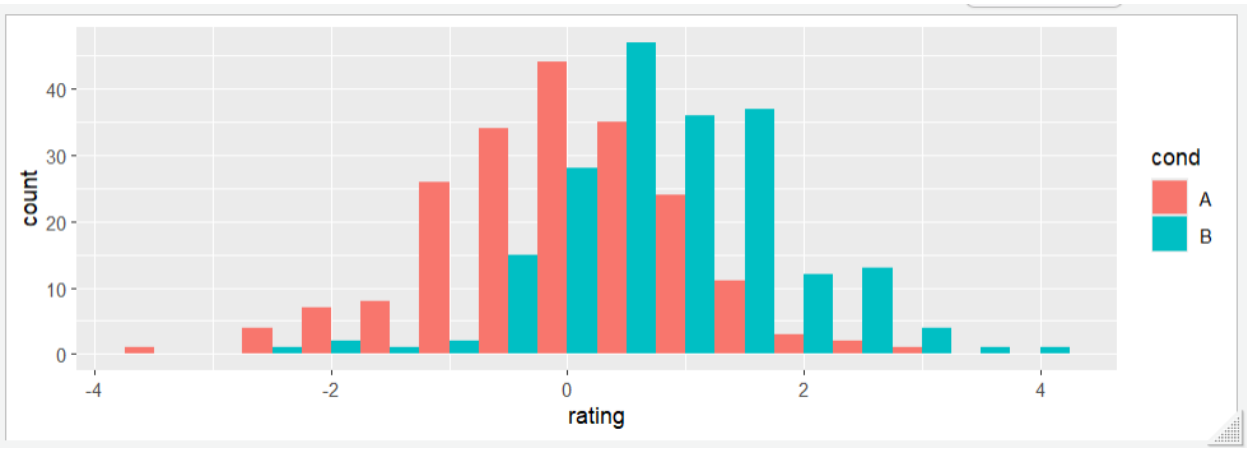
Part 2 screenshots:

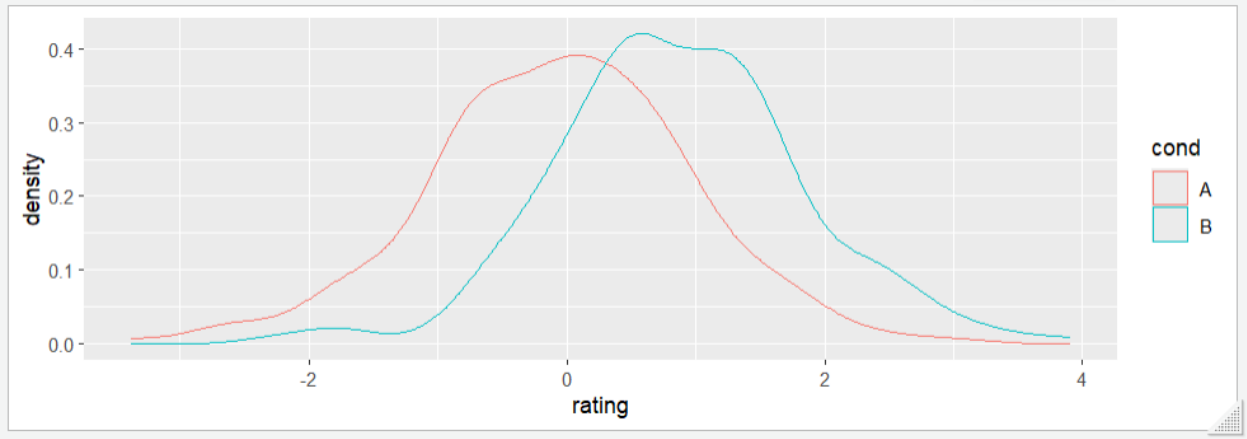


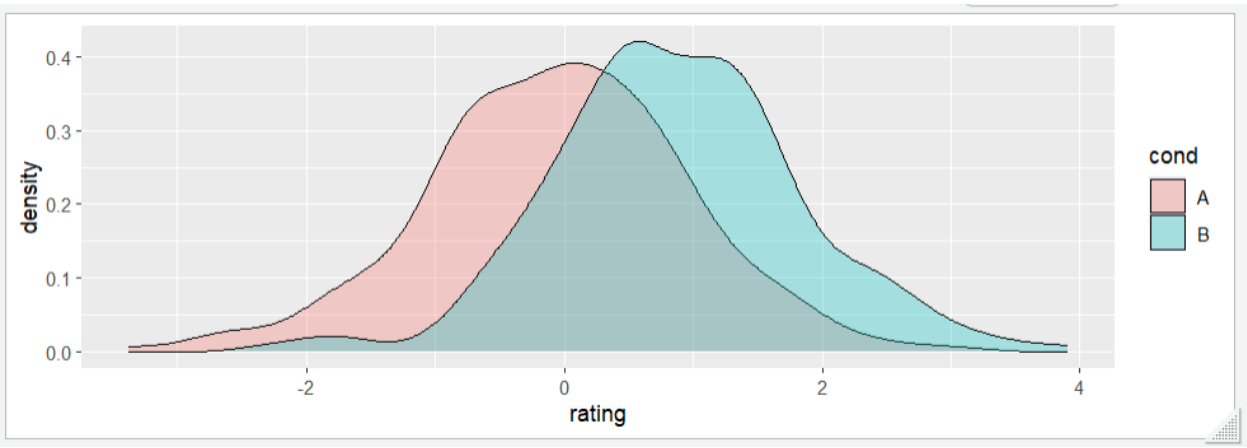


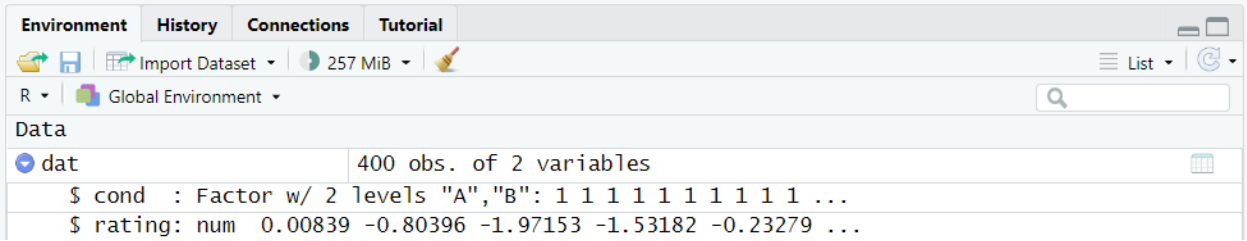
Part 3 screenshots:

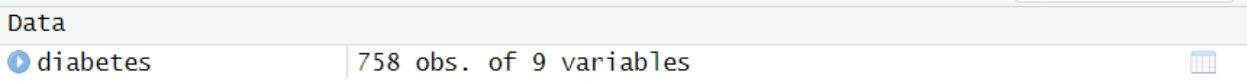






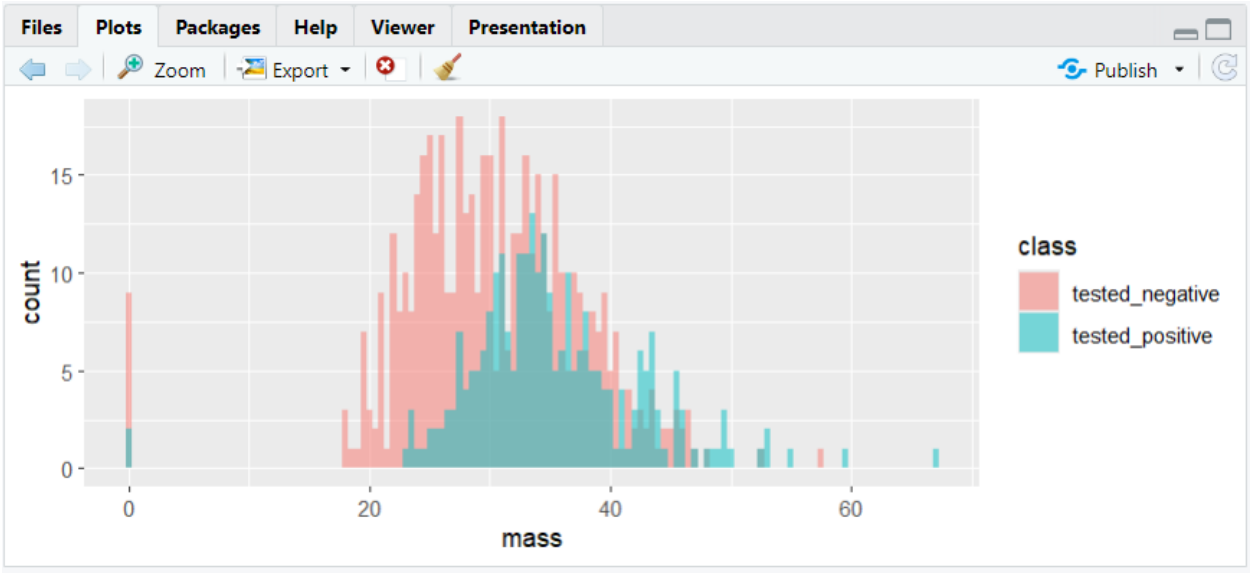


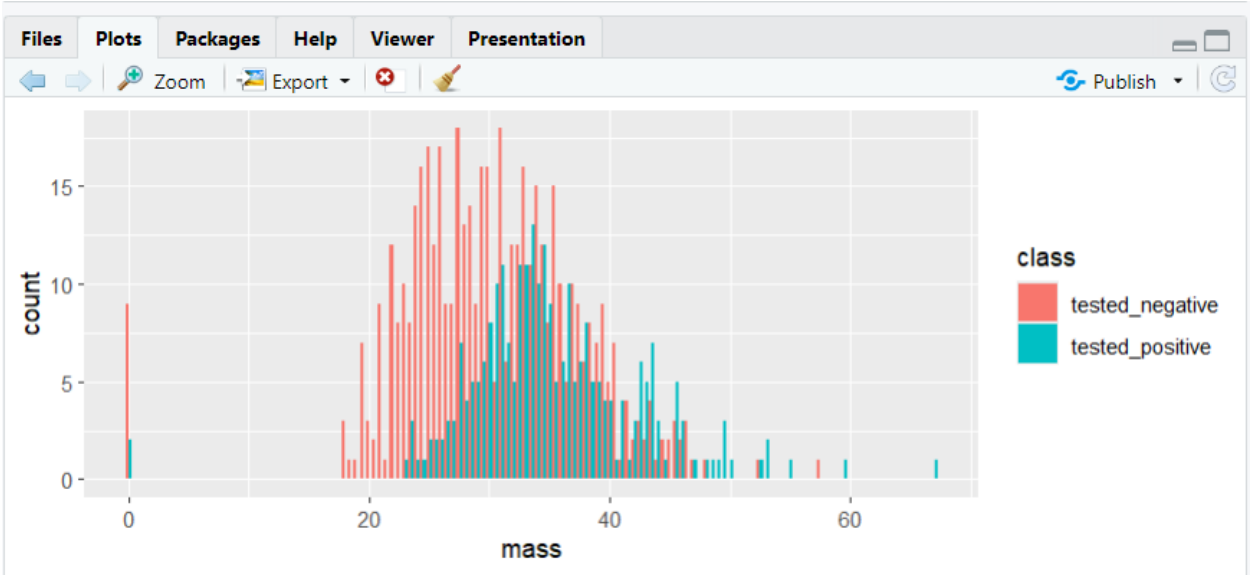


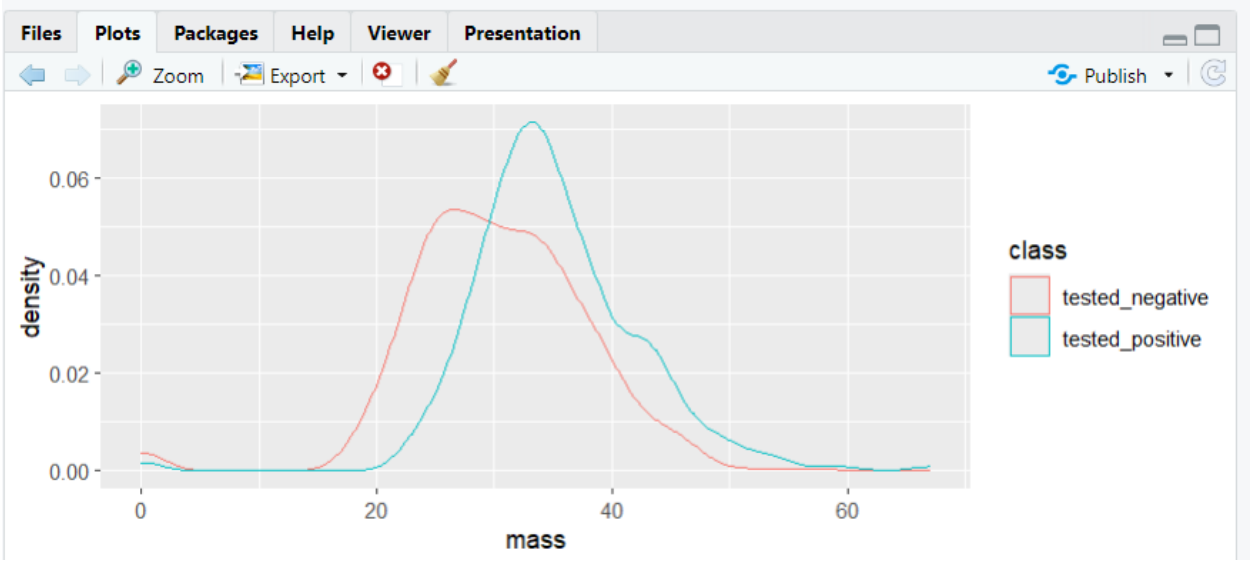


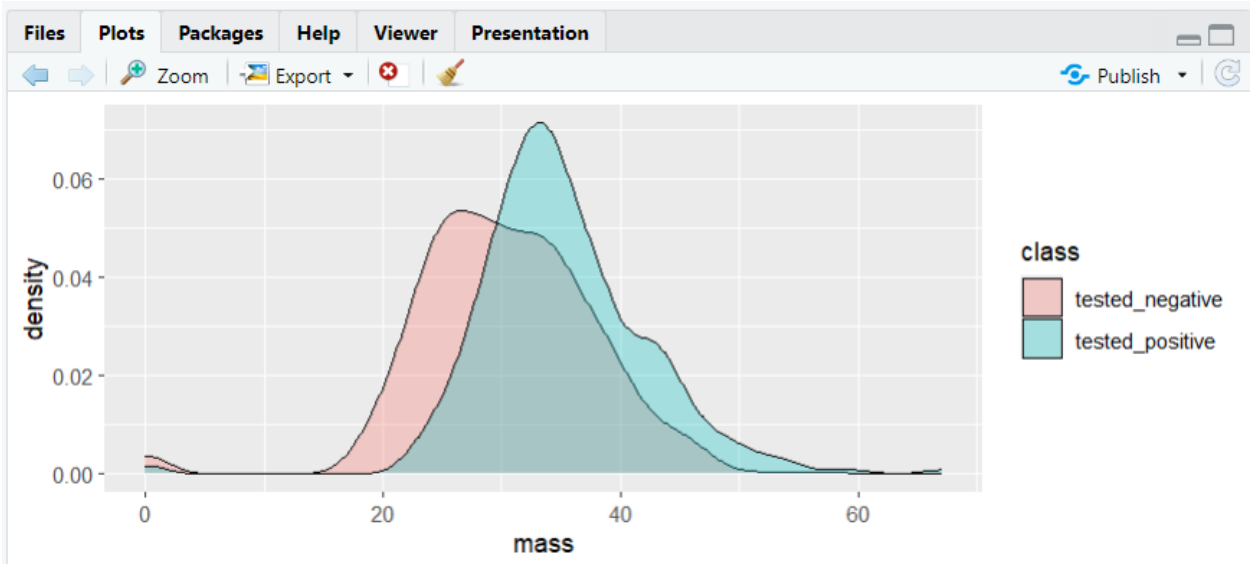
Part 3 screenshots (diabetes):

```
Data
diabetes                758 obs. of 9 variables
    $ preg : int  6 1 8 1 0 5 3 10 2 8 ...
    $ plas : int  148 85 183 89 137 116 78 115 197 125 ...
    $ pres : int  72 66 64 66 40 74 50 0 70 96 ...
    $ skin : int  35 29 0 23 35 0 32 0 45 0 ...
    $ insu : int  0 0 0 94 168 0 88 0 543 0 ...
    $ mass : num  33.6 26.6 23.3 28.1 43.1 25.6 31 35.3 30.5 0 ...
    $ pedi : num  0.627 0.351 0.672 0.167 2.288 ...
    $ age  : int  50 31 32 21 33 30 26 29 53 54 ...
    $ class: chr  "tested_positive" "tested_negative" "tested_positive" "tested_n...
```









Part 4 screenshots:

```
passengers                891 obs. of 13 variables
    $ X          : int  0 1 2 3 4 5 6 7 8 9 ...
    $ 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     : chr  "3" "1" "3" "1" ...
    $ Name       : chr  "Braund, Mr. Owen Harris" "Cumings, Mrs. John Bradley (Florence Bri…
    $ Sex        : chr  "male" "female" "female" "female" ...
    $ 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     : chr  "A/5 21171" "PC 17599" "STON/O2. 3101282" "113803" ...
    $ Fare       : num  7.25 71.28 7.92 53.1 8.05 ...
    $ Cabin      : chr  "" "C85" "" "C123" ...
    $ Embarked   : chr  "S" "C" "S" "S" ...
```

```
> passengers %>% drop_na() %>% summary()
       X          PassengerId       Survived         Pclass
 Min.   :  0.0   Min.   :  1.0   Min.   :0.0000   Length:714
 1st Qu.:221.2   1st Qu.:222.2   1st Qu.:0.0000   Class :character
 Median :444.0   Median :445.0   Median :0.0000   Mode  :character
 Mean   :447.6   Mean   :448.6   Mean   :0.4062
 3rd Qu.:676.8   3rd Qu.:677.8   3rd Qu.:1.0000
 Max.   :890.0   Max.   :891.0   Max.   :1.0000
     Name               Sex                 Age            SibSp
 Length:714         Length:714         Min.   : 0.42   Min.   :0.0000
 Class :character   Class :character   1st Qu.:20.12   1st Qu.:0.0000
 Mode  :character   Mode  :character   Median :28.00   Median :0.0000
                                       Mean   :29.70   Mean   :0.5126
                                       3rd Qu.:38.00   3rd Qu.:1.0000
                                       Max.   :80.00   Max.   :5.0000
     Parch           Ticket               Fare            Cabin
 Min.   :0.0000   Length:714         Min.   :  0.00   Length:714
 1st Qu.:0.0000   Class :character   1st Qu.:  8.05   Class :character
 Median :0.0000   Mode  :character   Median : 15.74   Mode  :character
 Mean   :0.4314                      Mean   : 34.69
 3rd Qu.:1.0000                      3rd Qu.: 33.38
 Max.   :6.0000                      Max.   :512.33
   Embarked
 Length:714
 Class :character
 Mode  :character
```

What I believe this is doing is taking a bunch of information that is being requested and give you all of the attributes that are associated with it as well as their types. It also gets rid of any empty spaces in any column as well as providing a summary of some statistics related to it.

```
> passengers %>% filter(Sex == "male")
     X PassengerId Survived Pclass                                 Name  Sex   Age
1    0           1        0      3              Braund, Mr. Owen Harris male 22.00
2    4           5        0      3             Allen, Mr. William Henry male 35.00
3    5           6        0      3                     Moran, Mr. James male    NA
4    6           7        0      1              McCarthy, Mr. Timothy J male 54.00
5    7           8        0      3       Palsson, Master. Gosta Leonard male  2.00
6   12          13        0      3       Saundercock, Mr. William Henry male 20.00
7   13          14        0      3          Andersson, Mr. Anders Johan male 39.00
8   16          17        0      3                  Rice, Master. Eugene male  2.00
9   17          18        1      2        Williams, Mr. Charles Eugene male    NA
10  20          21        0      2                Fynney, Mr. Joseph J male 35.00
11  21          22        1      2               Beesley, Mr. Lawrence male 34.00
12  23          24        1      1        Sloper, Mr. William Thompson male 28.00
13  26          27        0      3             Emir, Mr. Farred Chehab male    NA
14  27          28        0      1      Fortune, Mr. Charles Alexander male 19.00
```

This one is filtering it by the male sex and providing some additional information related to it as well.

```
> passengers %>% arrange(desc(Fare))
     X PassengerId Survived Pclass
1  258         259        1      1
2  679         680        1      1
3  737         738        1      1
4   27          28        0      1
5   88          89        1      1
6  341         342        1      1
7  438         439        0      1
8  311         312        1      1
9  742         743        1      1
10 118         119        0      1
11 299         300        1      1
12 380         381        1      ?
13 557         558        0      1
14 700         701        1      1
15 716         717        1      1
16 527         528        0      1
17 377         378        0      1
18 689         690        1      1
19 730         731        1      ?
20 779         780        1      1
21 318         319        1      1
22 856         857        1      1
23 268         269        1      1
24 332         333        0      1
25 609         610        1      1
26 297         298        0      1
27 305         306        1      1
28 498         499        0      1
29 708         709        1      1
30  31          32        1      1
31 195         196        1      1
32 269         270        1      1
```

	Name
1	Ward, Miss. Anna
2	Cardeza, Mr. Thomas Drake Martinez
3	Lesurer, Mr. Gustave J
4	Fortune, Mr. Charles Alexander
5	Fortune, Miss. Mabel Helen
6	Fortune, Miss. Alice Elizabeth
7	Fortune, Mr. Mark
8	Ryerson, Miss. Emily Borie
9	Ryerson, Miss. Susan Parker "Suzette"
10	Baxter, Mr. Quigg Edmond
11	Baxter, Mrs. James (Helene DeLaudeniere Chaput)
12	Bidois, Miss. Rosalie
13	Robbins, Mr. Victor
14	Astor, Mrs. John Jacob (Madeleine Talmadge Force)
15	Endres, Miss. Caroline Louise
16	Farthing, Mr. John
17	Widener, Mr. Harry Elkins
18	Madill, Miss. Georgette Alexandra
19	Allen, Miss. Elisabeth Walton
20	Robert, Mrs. Edward Scott (Elisabeth Walton McMillan)
21	Wick, Miss. Mary Natalie
22	Wick, Mrs. George Dennick (Mary Hitchcock)
23	Graham, Mrs. William Thompson (Edith Junkins)
24	Graham, Mr. George Edward
25	Shutes, Miss. Elizabeth W
26	Allison, Miss. Helen Loraine
27	Allison, Master. Hudson Trevor
28	Allison, Mrs. Hudson J C (Bessie Waldo Daniels)
29	Cleaver, Miss. Alice
30	Spencer, Mrs. William Augustus (Marie Eugenie)
31	Lurette, Miss. Elise
32	Bissette, Miss. Amelia
33	Young, Miss. Marie Grice
34	Ringhini, Mr. Sante
35	Spedden, Mrs. Frederic Oakley (Margaretta Corning Stone)
36	Burns, Miss. Elizabeth Margaret

	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
1	female	35.00	0	0	PC 17755	512.3292		C
2	male	36.00	0	1	PC 17755	512.3292	B51 B53 B55	C
3	male	35.00	0	0	PC 17755	512.3292	B101	C
4	male	19.00	3	2	19950	263.0000	C23 C25 C27	S
5	female	23.00	3	2	19950	263.0000	C23 C25 C27	S
6	female	24.00	3	2	19950	263.0000	C23 C25 C27	S
7	male	64.00	1	4	19950	263.0000	C23 C25 C27	S
8	female	18.00	2	2	PC 17608	262.3750	B57 B59 B63 B66	C
9	female	21.00	2	2	PC 17608	262.3750	B57 B59 B63 B66	C
10	male	24.00	0	1	PC 17558	247.5208	B58 B60	C
11	female	50.00	0	1	PC 17558	247.5208	B58 B60	C
12	female	42.00	0	0	PC 17757	227.5250		C
13	male	NA	0	0	PC 17757	227.5250		C
14	female	18.00	1	0	PC 17757	227.5250	C62 C64	C
15	female	38.00	0	0	PC 17757	227.5250	C45	C
16	male	NA	0	0	PC 17483	221.7792	C95	S
17	male	27.00	0	2	113503	211.5000	C82	C
18	female	15.00	0	1	24160	211.3375	B5	S
19	female	29.00	0	0	24160	211.3375	B5	S
20	female	43.00	0	1	24160	211.3375	B3	S
21	female	31.00	0	2	36928	164.8667	C7	S
22	female	45.00	1	1	36928	164.8667		S
23	female	58.00	0	1	PC 17582	153.4625	C125	S
24	male	38.00	0	1	PC 17582	153.4625	C91	S
25	female	40.00	0	0	PC 17582	153.4625	C125	S
26	female	2.00	1	2	113781	151.5500	C22 C26	S
27	male	0.92	1	2	113781	151.5500	C22 C26	S

This arranges passenger info by fare in descending order.

```
> passengers %>% mutate(FamSize = Parch + SibSp)
    X PassengerId Survived Pclass
1   0           1        0      3
2   1           2        1      1
3   2           3        1      3
4   3           4        1      1
5   4           5        0      3
6   5           6        0      3
7   6           7        0      1
8   7           8        0      3
9   8           9        1      3
10  9          10        1      2
11 10          11        1      3
12 11          12        1      1
13 12          13        0      3
14 13          14        0      3
15 14          15        0      3
16 15          16        1      2
17 16          17        0      3
18 17          18        1      2
19 18          19        0      3
20 19          20        1      3
21 20          21        0      2
22 21          22        1      2
23 22          23        1      3
24 23          24        1      1
25 24          25        0      3
26 25          26        1      ?
27 26          27        0      3
28 27          28        0      1
29 28          29        1      3
30 29          30        0      3
31 30          31        0      1
32 31          32        1      1
33 32          33        1      3
```

	Name	Sex	Age	SibSp	Parch
1	Braund, Mr. Owen Harris	male	22.0	1	0
2	Cumings, Mrs. John Bradley (Florence Briggs Thayer)	female	38.0	1	0
3	Heikkinen, Miss. Laina	female	26.0	0	0
4	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0
5	Allen, Mr. William Henry	male	35.0	0	0
6	Moran, Mr. James	male	NA	0	0
7	McCarthy, Mr. Timothy J	male	54.0	0	0
8	Palsson, Master. Gosta Leonard	male	2.0	3	1
9	Johnson, Mrs. Oscar W (Elisabeth Vilhelmina Berg)	female	27.0	0	2
10	Nasser, Mrs. Nicholas (Adele Achem)	female	14.0	1	0
11	Sandstrom, Miss. Marguerite Rut	female	4.0	1	1
12	Bonnell, Miss. Elizabeth	female	58.0	0	0
13	Saundercock, Mr. William Henry	male	20.0	0	0
14	Andersson, Mr. Anders Johan	male	39.0	1	5
15	Vestrom, Miss. Hulda Amanda Adolfina	female	14.0	0	0
16	Hewlett, Mrs. (Mary D Kingcome)	female	55.0	0	0
17	Rice, Master. Eugene	male	2.0	4	1
18	Williams, Mr. Charles Eugene	male	NA	0	0
19	Vander Planke, Mrs. Julius (Emelia Maria Vandemoortele)	female	31.0	1	0
20	Masselmani, Mrs. Fatima	female	NA	0	0
21	Fynney, Mr. Joseph J	male	35.0	0	0
22	Beesley, Mr. Lawrence	male	34.0	0	0
23	McGowan, Miss. Anna "Annie"	female	15.0	0	0
24	Sloper, Mr. William Thompson	male	28.0	0	0
25	Palsson, Miss. Torbora Danira	female	8.0	3	1

	Ticket	Fare	Cabin	Embarked	FamSize
1	A/5 21171	7.2500		S	1
2	PC 17599	71.2833	C85	C	1
3	STON/O2. 3101282	7.9250		S	0
4	113803	53.1000	C123	S	1
5	373450	8.0500		S	0
6	330877	8.4583		Q	0
7	17463	51.8625	E46	S	0
8	349909	21.0750		S	4
9	347742	11.1333		S	2
10	237736	30.0708		C	1
11	PP 9549	16.7000	G6	S	2
12	113783	26.5500	C103	S	0
13	A/5. 2151	8.0500		S	0
14	347082	31.2750		S	6
15	350406	7.8542		S	0
16	248706	16.0000		S	0
17	382652	29.1250		Q	5

This one seems to take parents and children and siblings and spouses and combines them into parch for parents and children, sibsp for siblings and spouses. Then they take the total size of the family and put it into famsize.

```
> passengers %>% group_by(Sex) %>% summarise(meanFare = mean(Fare), numSurv = sum(Survived))
# A tibble: 2 × 3
  Sex    meanFare numSurv
  <chr>     <dbl>   <int>
1 female     44.5     233
2 male       25.5     109
> 
```

This one takes the mean of the fare between men and women as well as the number of men and women who survived and compiles them into a list here.

Part 5 screenshots:

```
> # print result
> print(percentiles)
10% 30% 50% 60%
  0  10  23  27
```

Data	
diabetes	758 obs. of 9 variables
$ preg : int	6 1 8 1 0 5 3 10 2 8 ...
$ plas : int	148 85 183 89 137 116 78 115 197 125 ...
$ pres : int	72 66 64 66 40 74 50 0 70 96 ...
$ skin : int	35 29 0 23 35 0 32 0 45 0 ...
$ insu : int	0 0 0 94 168 0 88 0 543 0 ...
$ mass : num	33.6 26.6 23.3 28.1 43.1 25.6 31 35.3 30.5 0 ...
$ pedi : num	0.627 0.351 0.672 0.167 2.288 ...
$ age : int	50 31 32 21 33 30 26 29 53 54 ...
$ class: chr	"tested_positive" "tested_negative" "tested_positive" "tested_n…
Values	
percentiles	Named num [1:4] 0 10 23 27