Likert Data Assignment   Haowen Yu
Using the RSE data at
https://openpsychometrics.org/_rawdata/,
2/15/2014 Rosenberg Self-Esteem Scale data,
Summarize the overall results for each question (Q1-Q10), and separately for each gender (M,F).
For which questions does there appear to be a significant difference in responses based on gender?

Preparing before answer the questions.

Split Columns first.

```
#Change csv columns
df <- read_csv("g:/data.csv", col_names = TRUE)
head(df)
colnames(df)

names <- colnames(df) %>%
  strsplit("\t") %>%
  unlist()
names

df <- df %>%
  separate(col = colnames(df),
           sep = '\t',
           into = names)
head(df)
tail(df)
```

Change number to answers so I can understand the answers better.

```
#Change numbers to answers
df$Q1 <- rec(df$Q1, rec = "1=stronglydisagree;2=disagree;3=agree;4=stronglyagree;0=noanswer")
df$Q2 <- rec(df$Q2, rec = "1=stronglydisagree;2=disagree;3=agree;4=stronglyagree;0=noanswer")
df$Q3 <- rec(df$Q3, rec = "1=stronglydisagree;2=disagree;3=agree;4=stronglyagree;0=noanswer")
df$Q4 <- rec(df$Q4, rec = "1=stronglydisagree;2=disagree;3=agree;4=stronglyagree;0=noanswer")
df$Q5 <- rec(df$Q5, rec = "1=stronglydisagree;2=disagree;3=agree;4=stronglyagree;0=noanswer")
df$Q6 <- rec(df$Q6, rec = "1=stronglydisagree;2=disagree;3=agree;4=stronglyagree;0=noanswer")
df$Q7 <- rec(df$Q7, rec = "1=stronglydisagree;2=disagree;3=agree;4=stronglyagree;0=noanswer")
df$Q8 <- rec(df$Q8, rec = "1=stronglydisagree;2=disagree;3=agree;4=stronglyagree;0=noanswer")
df$Q9 <- rec(df$Q9, rec = "1=stronglydisagree;2=disagree;3=agree;4=stronglyagree;0=noanswer")
df$Q10 <- rec(df$Q10, rec = "1=stronglydisagree;2=disagree;3=agree;4=stronglyagree;0=noanswer")
df$gender <- rec(df$gender, rec = "1=male;2=female;3=other;0=noanswer")
df$source <- rec(df$source, rec = "1=frontpage;2=googlesearch;3=other")
head(df)
tail(df)
write_csv(df, "g:/dataNew.csv")
```

Note for Analyze the following questions

I did not count no-answer as a sufficient answer, but I compared the number of people who choose to give answer for different questions. Codes are similar for each question, in order to save pages count for the pdf file, I will only paste codes for Question 1 here, you can find all my codes in R file.

1. For Question 1

```
#Frequency Count and percentage on Q1
df$Q1 <- factor(df$Q1, levels = c("stronglydisagree",
                                  "disagree",
                                  "agree",
                                  "stronglyagree",
                                  "noanswer"))
freq <- table(df$Q1)
print(freq)
```
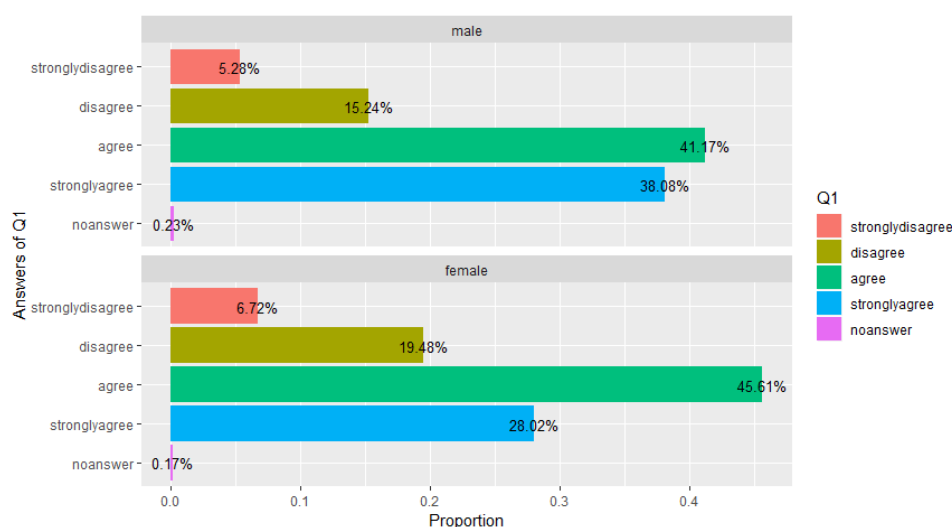
```
> freq <- table(df$Q1)
> print(freq)

stronglydisagree        disagree        agree    stronglyagree        noanswer
            3011            8647        21018            15200              98
>
```

Above output shows the most people agree with Q1 which is "I feel that I am a person of worth, at least on an equal plane with others.", the least people choose strongly disagree and 98 people did not answer this question.

```
#By different gender
Q1gender <- df[df$gender %in% c("male", "female"), c("Q1", "gender")]
head(Q1gender)

Q1gender <- Q1gender %>%
  group_by(gender) %>%
  count(Q1) %>%
  mutate(prop = n / sum(n)) %>%
  ungroup() %>%
  mutate(prop_perc = paste0(round(prop * 100, 2), "%"))
Q1gender$Q1 <- factor(Q1gender$Q1,
                 levels = c("stronglydisagree",
                            "disagree",|
                            "agree",
                            "stronglyagree",
                            "noanswer"))
Q1gender$gender <- factor(Q1gender$gender,
                 levels = c("male", "female"))
Q1gender
```

```
   gender Q1                    n     prop prop_perc
   <fct>  <fct>              <int>    <dbl> <chr>
 1 female stronglydisagree   1961 0.0672   6.72%
 2 female disagree           5684 0.195    19.48%
 3 female agree             13310 0.456    45.61%
 4 female stronglyagree      8177 0.280    28.02%
 5 female noanswer             50 0.00171  0.17%
 6 male   stronglydisagree    940 0.0528   5.28%
 7 male   disagree           2713 0.152    15.24%
 8 male   agree              7328 0.412    41.17%
 9 male   stronglyagree      6779 0.381    38.08%
10 male   noanswer             41 0.00230  0.23%
```

```
#Relation plot on percentage
ggplot(Q1gender) +
  geom_bar(aes(x = forcats::fct_rev(Q1), y = prop, fill = Q1),
           stat = "identity") +
  geom_text(aes(x = Q1, y = prop, label = prop_perc), size = 3.5) +
  facet_wrap(~gender, ncol = 1) +
  xlab("Answers of Q1") +
  ylab("Proportion") +
  coord_flip()
```


The percentage of male who strongly agree with this question is significantly higher than female.

```
#Question 2
#Frequency Count and percentage on Q2
df$Q1 <- factor(df$Q2, levels = c("stronglydisagree",
                                  "disagree",
                                  "agree",
                                  "stronglyagree",
                                  "noanswer"))
freq <- table(df$Q2)
print(freq)
```
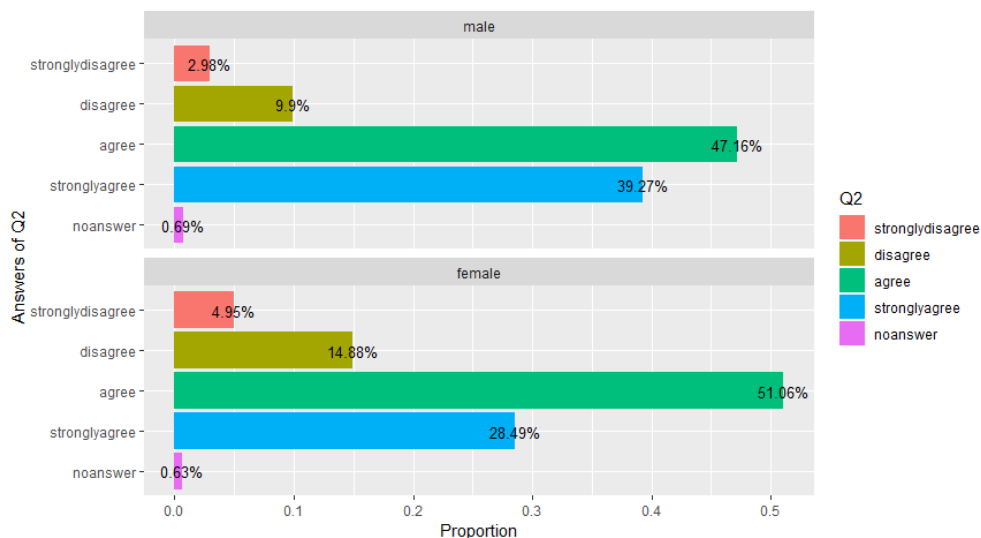
```
         agree         disagree         noanswer    stronglyagree stronglydisagree
         23743             6296              316            15558             2061
```

Above output shows the most people agree with Q2 which is "I feel that I have a number of good qualities.", the least people choose strongly disagree and 316 people did not answer this question. The number of people who did not give answer in question 2 is clearly bigger than question 1.

```
> Q2gender
# A tibble: 10 x 5
   gender Q2                     n   prop prop_perc
   <fct>  <fct>              <int>  <dbl> <chr>
 1 female agree              14899 0.511  51.06%
 2 female disagree            4341 0.149  14.88%
 3 female noanswer             183 0.00627 0.63%
 4 female stronglyagree       8315 0.285  28.49%
 5 female stronglydisagree    1444 0.0495 4.95%
 6 male   agree               8395 0.472  47.16%
 7 male   disagree            1762 0.0990 9.9%
 8 male   noanswer             123 0.00691 0.69%
 9 male   stronglyagree       6991 0.393  39.27%
10 male   stronglydisagree     530 0.0298 2.98%
```
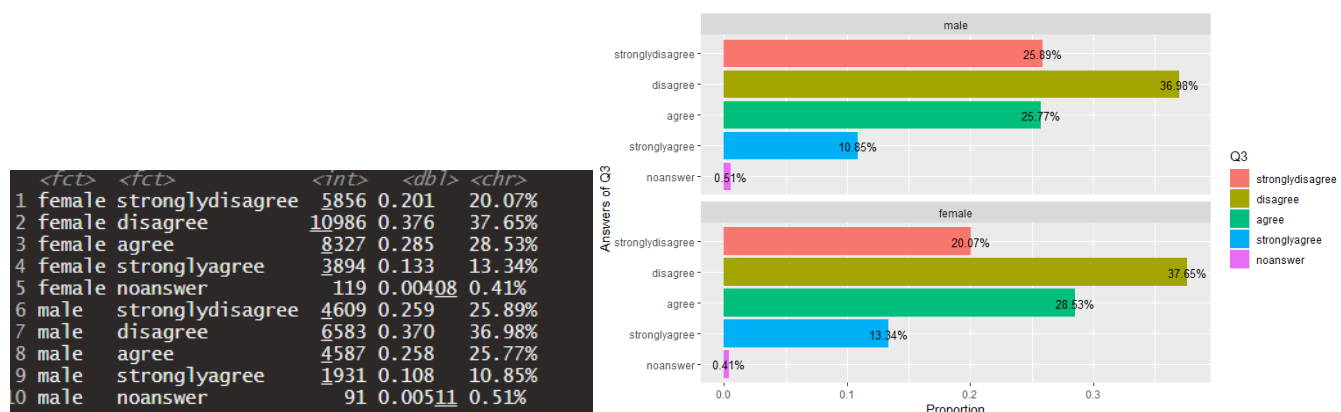

The percentage of male who strongly agree with this question is significantly higher than female.

Female give more negative answer for question 2.

3. For Question 3

```
stronglydisagree      disagree      agree   stronglyagree      noanswer
           10628         17868      13223           6032           223
```

Above output shows the most people disagree with Q3 which is "All in all, I am inclined to feel that I am a failure.", the least people choose strongly agree and 223 people did not answer this question.


```
   <fct>  <fct>             <int>   <dbl>  <chr>
 1 female stronglydisagree   5856  0.201  20.07%
 2 female disagree          10986  0.376  37.65%
 3 female agree              8327  0.285  28.53%
 4 female stronglyagree      3894  0.133  13.34%
 5 female noanswer            119  0.00408 0.41%
 6 male   stronglydisagree   4609  0.259  25.89%
 7 male   disagree           6583  0.370  36.98%
 8 male   agree              4587  0.258  25.77%
 9 male   stronglyagree      1931  0.108  10.85%
10 male   noanswer             91  0.00511 0.51%
```

There's not significant difference by different gender based on above output and figure.

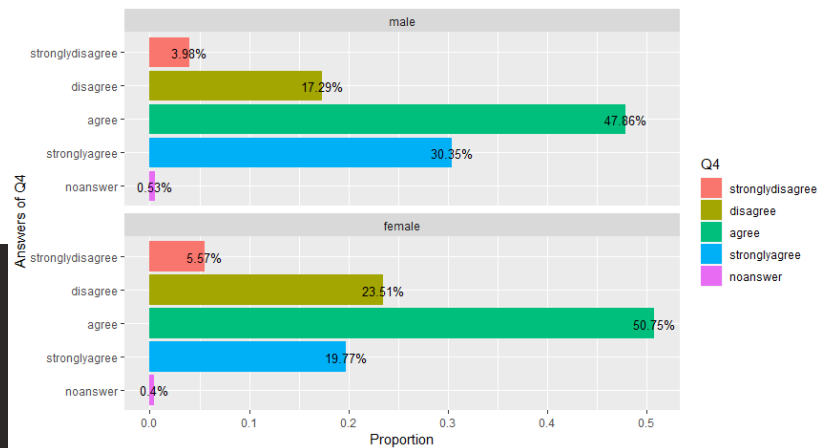Female give more positive answer for question 3.

4. For Question 4

```
stronglydisagree      disagree      agree   stronglyagree      noanswer
            2434         10213      23723          11381           223
```

Above output shows the most people agree with Q4 which is "I am able to do things as well as most other people.", the least people choose strongly disagree and 223 people did not answer this question.

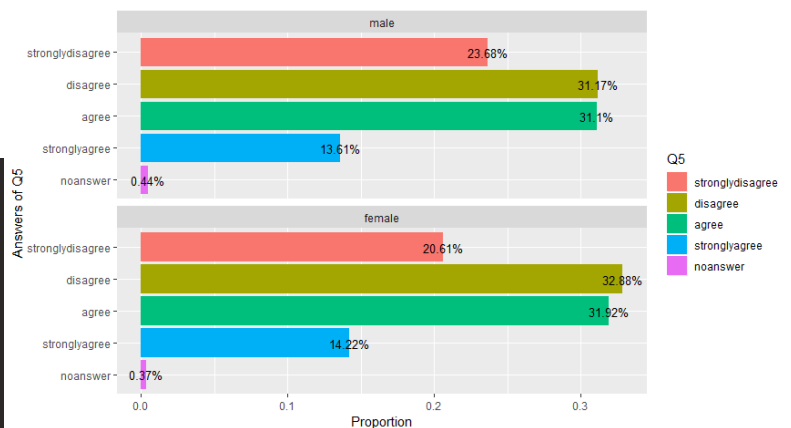|			n		
	<fct>	<fct>	<int>	<dbl>	<chr>
1	female	stronglydisagree	1624	0.0557	5.57%
2	female	disagree	6860	0.235	23.51%
3	female	agree	14810	0.508	50.75%
4	female	stronglyagree	5770	0.198	19.77%
5	female	noanswer	118	0.00404	0.4%
6	male	stronglydisagree	708	0.0398	3.98%
7	male	disagree	3077	0.173	17.29%
8	male	agree	8519	0.479	47.86%
9	male	stronglyagree	5403	0.304	30.35%
10	male	noanswer	94	0.00528	0.53%

The percentage of male who strongly agree with this question is significantly higher than female.

5. For Question 5

stronglydisagree	disagree	agree	stronglyagree	noanswer
10389	15402	15221	6769	193

Above output shows the most people disagree with Q5 which is "I feel I do not have much to be proud of.", the least people choose strongly agree and 193 people did not answer this question. The number of people who did not give answer in question 5 is relatively lower than question 3&4.

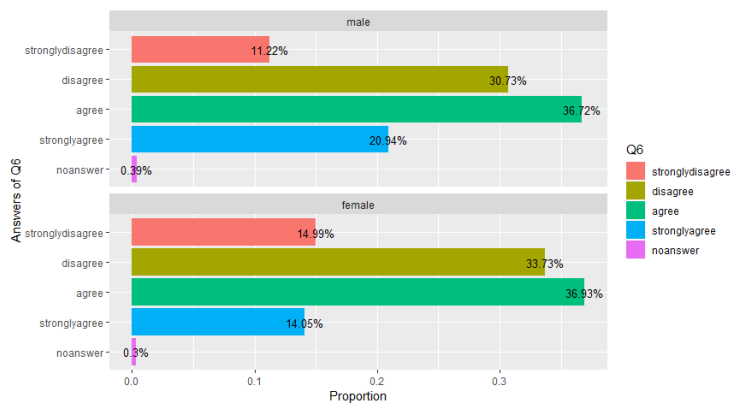|	gender	Q5	n	prop	prop_perc
	<fct>	<fct>	<int>	<dbl>	<chr>
1	female	stronglydisagree	6014	0.206	20.61%
2	female	disagree	9594	0.329	32.88%
3	female	agree	9316	0.319	31.92%
4	female	stronglyagree	4149	0.142	14.22%
5	female	noanswer	109	0.00374	0.37%
6	male	stronglydisagree	4216	0.237	23.68%
7	male	disagree	5548	0.312	31.17%
8	male	agree	5536	0.311	31.1%
9	male	stronglyagree	2423	0.136	13.61%
10	male	noanswer	78	0.00438	0.44%

There's not significant difference by different gender based on above output and figure.

6. For Question 6

stronglydisagree	disagree	agree	stronglyagree	noanswer
6555	15686	17595	7973	165

Above output shows the most people disagree with Q6 which is "I take a positive attitude toward myself.", the least people choose strongly disagree and 165 people did not answer this question.

	gender	Q6	n	prop	prop_perc
	<fct>	<fct>	<int>	<dbl>	<chr>
1	female	stronglydisagree	4375	0.150	14.99%
2	female	disagree	9844	0.337	33.73%
3	female	agree	10776	0.369	36.93%
4	female	stronglyagree	4099	0.140	14.05%
5	female	noanswer	88	0.00302	0.3%
6	male	stronglydisagree	1997	0.112	11.22%
7	male	disagree	5470	0.307	30.73%
8	male	agree	6537	0.367	36.72%
9	male	stronglyagree	3727	0.209	20.94%
10	male	noanswer	70	0.00393	0.39%

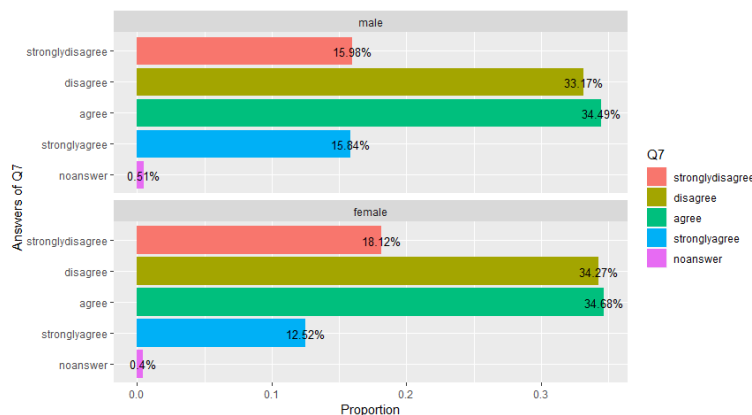The percentage of male who strongly agree with this question is significantly higher than female.

stronglydisagree	disagree	agree	stronglyagree	noanswer
8376	16284	16509	6589	216

Above output shows the most people agree with Q7 which is "On the whole, I am satisfied with myself.", the least people choose strongly agree and 216 people did not answer this question.

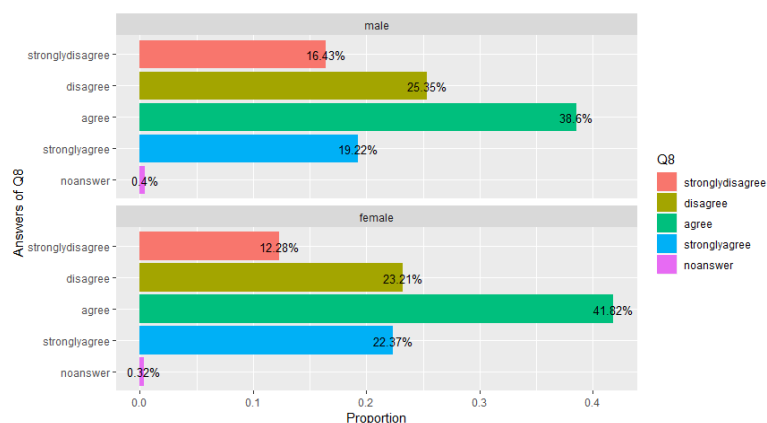|	gender	Q7	n	prop	prop_perc
	<fct>	<fct>	<int>	<dbl>	<chr>
1	female	stronglydisagree	5288	0.181	18.12%
2	female	disagree	10002	0.343	34.27%
3	female	agree	10120	0.347	34.68%
4	female	stronglyagree	3654	0.125	12.52%
5	female	noanswer	118	0.00404	0.4%
6	male	stronglydisagree	2845	0.160	15.98%
7	male	disagree	5905	0.332	33.17%
8	male	agree	6140	0.345	34.49%
9	male	stronglyagree	2820	0.158	15.84%
10	male	noanswer	91	0.00511	0.51%

There's not significant difference by different gender based on above output and figure.

stronglydisagree	disagree	agree	stronglyagree	noanswer
6632	11520	19452	10193	177

Above output shows the most people agree with Q8 which is "I wish I could have more respect for myself.", the least people choose strongly disagree and 177 people did not answer this question.

	<fct>	<fct>	<int>	<dbl>	<chr>
1	female	stronglydisagree	3583	0.123	12.28%
2	female	disagree	6773	0.232	23.21%
3	female	agree	12204	0.418	41.82%
4	female	stronglyagree	6528	0.224	22.37%
5	female	noanswer	94	0.00322	0.32%
6	male	stronglydisagree	2924	0.164	16.43%
7	male	disagree	4512	0.253	25.35%
8	male	agree	6871	0.386	38.6%
9	male	stronglyagree	3422	0.192	19.22%
10	male	noanswer	72	0.00404	0.4%

Female give more positive answer for question 8.
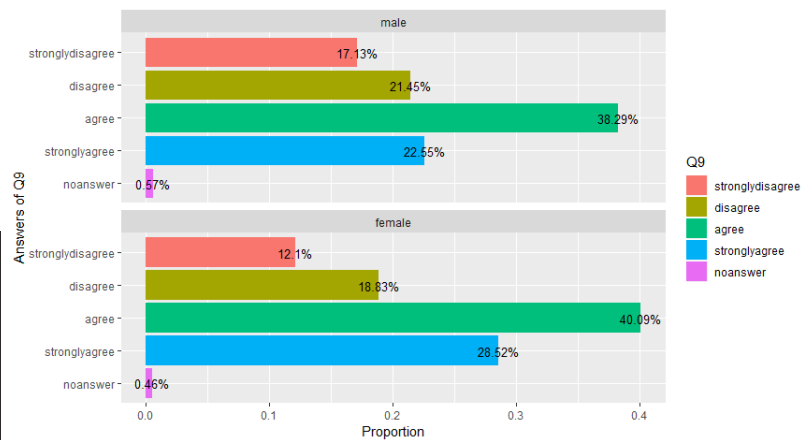
There's not significant difference by different gender based on above output and figure.

```
stronglydisagree        disagree          agree    stronglyagree         noanswer
            6691            9469          18855            12713              246
```

Above output shows the most people agree with Q9 which is "I certainly feel useless at times.", the least people choose strongly disagree and 246 people did not answer this question.


```
1 female stronglydisagree  3530 0.121    12.1%
2 female disagree          5496 0.188    18.83%
3 female agree            11699 0.401    40.09%
4 female stronglyagree     8323 0.285    28.52%
5 female noanswer           134 0.00459  0.46%
6 male   stronglydisagree  3050 0.171    17.13%
7 male   disagree          3819 0.215    21.45%
8 male   agree             6816 0.383    38.29%
9 male   stronglyagree     4014 0.225    22.55%
10 male  noanswer           102 0.00573  0.57%
```

Male give more negative answers for question 9.
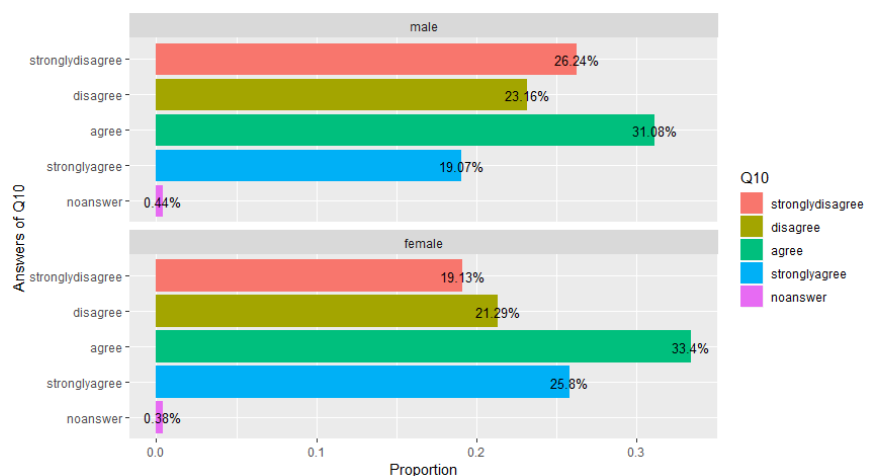
There's not significant difference by different gender based on above output and figure.

```
stronglydisagree        disagree          agree    stronglyagree         noanswer
           10421           10498          15584            11269              202
>|
```

Above output shows the most people agree with Q10 which is "At times I think I am no good at all.", the least people choose strongly disagree and 202 people did not answer this question.


```
1 female stronglydisagree  5582 0.191    19.13%
2 female disagree          6213 0.213    21.29%
3 female agree             9746 0.334    33.4%
4 female stronglyagree     7529 0.258    25.8%
5 female noanswer           112 0.00384  0.38%
6 male   stronglydisagree  4671 0.262    26.24%
7 male   disagree          4123 0.232    23.16%
8 male   agree             5533 0.311    31.08%
9 male   stronglyagree     3395 0.191    19.07%
10 male  noanswer            79 0.00444  0.44%
```

The percentage of male who strongly disagree with this question is significantly higher than female.

And the percentage of male who strongly agree with this question is significantly lower than female.