Likert data：：CHEAT SHEET

Reference: https://en.wikipedia.org/wiki/Likert_scale
https://xang1234.github.io/likert/
https://wpforms.com/beginners-guide-what-is-a-likert-scale-and-how-to-use-it/
https://mbounthavong.com/blog/2019/5/16/communicating-data-effectively-with-data-visualization-part-15-divergent-stacked-bar-chart-for-likert-scales

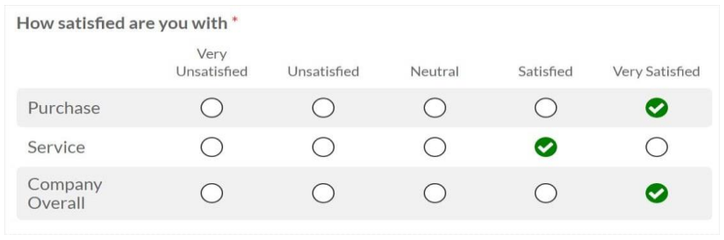
Introduction

Likert scales: Likert scales are used to represent survey or psychometric data. Users are asked a series of questions and are asked to give a numerical value for each question. User responses to multiple questions are centered around the neutral mark and they are an easy way to see survey responses are positive or negative. A scale can be created as the simple sum or average of questionnaire responses over the set of individual items (questions). In so doing, Likert scaling assumes distances between each choice (answer option) are equal.

Likert data: data with Likert scales

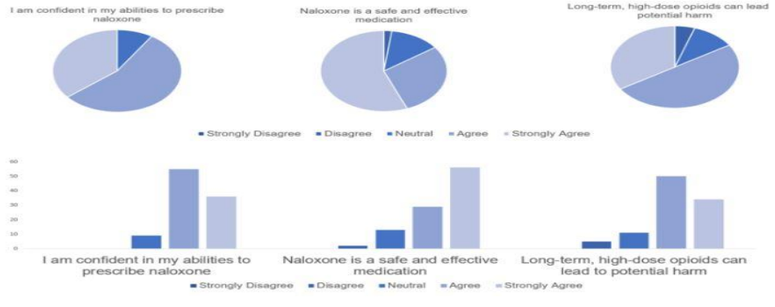
Common Example:

1. Strongly Agree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree
2. Highly Dissatisfied, Dissatisfied, Neutral, Satisfied, Highly Satisfied
3. Never, Almost Never, Neutral, Almost Every Time, Every Time

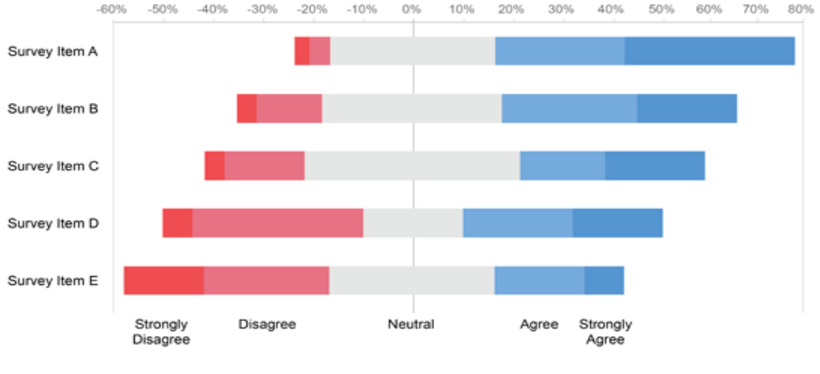


How do we perform data visualization on Likert data ?

1. Bar and Pie charts



2. Diverging stacked bar chart



Data visualization of Likert data in R

HH Package:

HH Package by Heiberger and Holland implements the Likert scale function.

How to install HH Package?

```
install.package("HH")
library("HH")
```

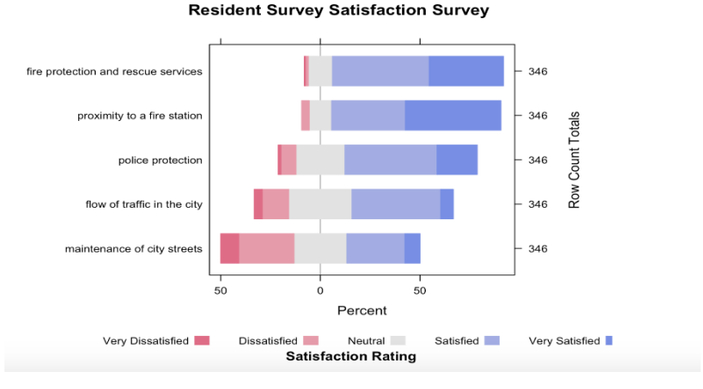
Example #1

If we have have a series of questions about the quality of residence in a certain area. Residents are asked to rate the quality of residence as very dissatisfied, dissatisfied, neutral, satisfied and very satisfied. A total of 5 questions were asked as shown below

```
##                                Measure Very Dissatisfied Dissatisfied Neutral
## 1                       police protection                5            26      85
## 2 fire protection and rescue services                   2             5      42
## 3          proximity to a fire station                  0            13      39
## 4          maintenance of city streets                 31            96      92
## 5          flow of traffic in the city                 14            46     110
##   Satisfied Very Satisfied
## 1       160             70
## 2       168            129
## 3       128            166
## 4       101             26
## 5       154             22
```

Then, we use likert() to plot diverging stacked bar chart

```
likert(Measure ~ ., data=df_table, ylab=NULL,
      ReferenceZero=3, as.percent=TRUE,
      positive.order=TRUE,
      main = list("Resident Survey Satisfaction Survey",x=unit(.55, "npc")),
      sub= list("Satisfaction Rating",x=unit(.57, "npc")),
      strip=FALSE,
      par.strip.text=list(cex=.7))
```



How to call function to plot likert data?

likert(x, ...) Or
plot. likert(x, ...)
For more information about this function, please visit
https://rdrr.io/cran/HH/man/likert.html

Example #2

We have a series of questions about the quality of food in a school. Students are asked to rate the food and service as very poor, poor, satisfactory, good and excellent. A total of 8 questions were asked.

	Measure	Very Poor	Poor	Satisfactory	Good	Excellent
1	*Temperature of Food*	0	7	38	91	14
2	*Timeliness of Meals Served*	0	1	27	57	65
3	*Accuracy of Meals Served*	0	1	34	49	66
4	*Courtesy of Food Service Staff*	0	2	12	56	80
5	*Portion Size of Meals Served*	0	4	33	96	17
6	*Taste of Meals Served*	2	19	50	75	4
7	*Variety of Food Provided in Menu*	0	5	56	73	16
8	*Presentation of Meals Served*	0	0	23	19	8

Then, we use likert() to plot diverging stacked bar chart

```
Type <-
c("Meal","Service","Service","Service","Meal","Meal","Meal","Meal")
SurveyData_Type<-cbind(SurveyData,Type)

likert(Measure ~ .| Type,data=Oct_df2, layout=c(1,2),
 scales=list(y=list(relation="free")),between=list(y=1),
 strip.left=strip.custom(bg="gray97"), strip=FALSE,
 par.strip.text=list(cex=1.1, lines=2), ylab=NULL, cex=1.2,
ReferenceZero=3,as.percent=TRUE, positive.order=TRUE,
main = list("Meal Service Satisfaction Survey Report",x=unit(.55, "npc")),
sub= list("Satisfaction Rating",x=unit(.57, "npc")),
xlim=c(-40,-20,0,20,40,60,80,100),resize.height.tuning=1)
```