

Stat290 finalproject

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2019-03-17

This project shows a local weather pattern in SF Bay area using 2018 personal weather stations data from WU.

- 1) provide interactive way for user to select city/geo location and show weather pattern
- 2) show local area weather pattern
 - i) Temperature (mean/min/max)
 - ii) Humidity (mean/min/max)
 - iii) Wind (direction/speed)
 - iv) Temperature contour line
 - v) Weather historical trend
 - vi) user data save/reload

```
#' @return run package
library(stat290.finalproject)
#' run shiny UI as below:
#' runWeatherUI()
```

```
#' @return a table of historical weather for selected city
#' ?history_weather
c="Alameda"
d1="2018-06-01"
d2="2018-12-31"
history_weather_tbl=history_weather(city_name = c,start_date=d1,end_date=d2)
history_weather_tbl[1:3,]
```

```
##   location_city      id      lon      lat temp temp_min temp_max
## 1      Alameda KCAALAME1 -122.2552 37.76756 18.1      11.1      25.0
## 2      Alameda KCAALAME1 -122.2552 37.76756 21.7      12.7      30.7
## 3      Alameda KCAALAME1 -122.2552 37.76756 19.9      13.5      26.4
##   humidity humidity_min humidity_max wind_dir wind_dir_degrees wind_speed
## 1       68          44          86      WNW          294          2
## 2       64          35          86      NW          310          1
## 3       71          49          87      NW          310          3
##   wind_speed_max wind_gust_speed wind_gust_speed_max      date year month
## 1             26             32             32 2018-06-01 2018      6
## 2             16             18             18 2018-06-02 2018      6
## 3             21             24             24 2018-06-03 2018      6
##   day
## 1   1
## 2   2
## 3   3
```

```
#' @return a table of historical weather of nearby stations(PWS) based on selected city
```

```
#' ?nearby_pws_city
pws_id_selected <- nearby_pws_city(city_name = "Alameda",check_date="2018-05-05")
pws_id_selected[1:3,]
```

```
##   location_city      id      lon      lat temp humidity wind_dir
```

```
## 1      Alameda KCAALAME1 -122.2552 37.76756 14.6      81      WNW
## 2      Alameda KCAALAME40 -122.2657 37.76909 15.3      72      North
## 3      Alameda KCAALAME36 -122.2653 37.77551 15.6      86      SW
##  wind_dir_degrees wind_speed      date
## 1              294              3 2018-05-05
## 2              0              0 2018-05-05
## 3              215              1 2018-05-05
```

notes

```
##' @return a table of historical weather of nearby stations(PWS) based on location (lon,lat and distance)
```

```
##' ?nearby_pws_coordinates
```

```
l1=-122.27999878
```

```
l2=37.52000046
```

```
dis=4000
```

```
d="2018-05-05"
```

```
pws_id_selected=nearby_pws_coordinates(lon=l1,lat=l2,distance = dis,data=pws,check_date = d)
```

```
pws_id_selected[1:3,]
```

```
##          id      lon      lat temp humidity wind_dir wind_dir_degrees
## 1 KCABELM042 -122.2788 37.52155 15.2      74      West      278
## 2 KCABELM015 -122.2828 37.52161 14.3      78      WNW      294
## 3 KCABELM062 -122.2758 37.52020 15.3      79      WSW      255
##  wind_speed      date
## 1              3 2018-05-05
## 2              2 2018-05-05
## 3              4 2018-05-05
```

```
##' @return a map of historical weather for selected PWS list or city
```

```
##' ?weather_map
```

```
library(ggplot2)
```

```
library(ggmap)
```

```
## Google's Terms of Service: https://cloud.google.com/maps-platform/terms/.
```

```
## Please cite ggmap if you use it! See citation("ggmap") for details.
```

```
library(akima)
```

```
pws_id_selected <- nearby_pws_city(city_name = "Alameda",check_date="2018-05-05")
```

```
weather_map(df=pws_id_selected)
```

```
## matype = "terrain-background" is only available with source = "stamen".
```

```
## resetting to source = "stamen"...
```

```
## Source : https://maps.googleapis.com/maps/api/staticmap?center=37.772909,-122.25578&zoom=14&size=6400x6400
```

```
## Source : http://tile.stamen.com/terrain-background/14/2626/6331.png
```

```
## Source : http://tile.stamen.com/terrain-background/14/2627/6331.png
```

```
## Source : http://tile.stamen.com/terrain-background/14/2628/6331.png
```

```
## Source : http://tile.stamen.com/terrain-background/14/2629/6331.png
```

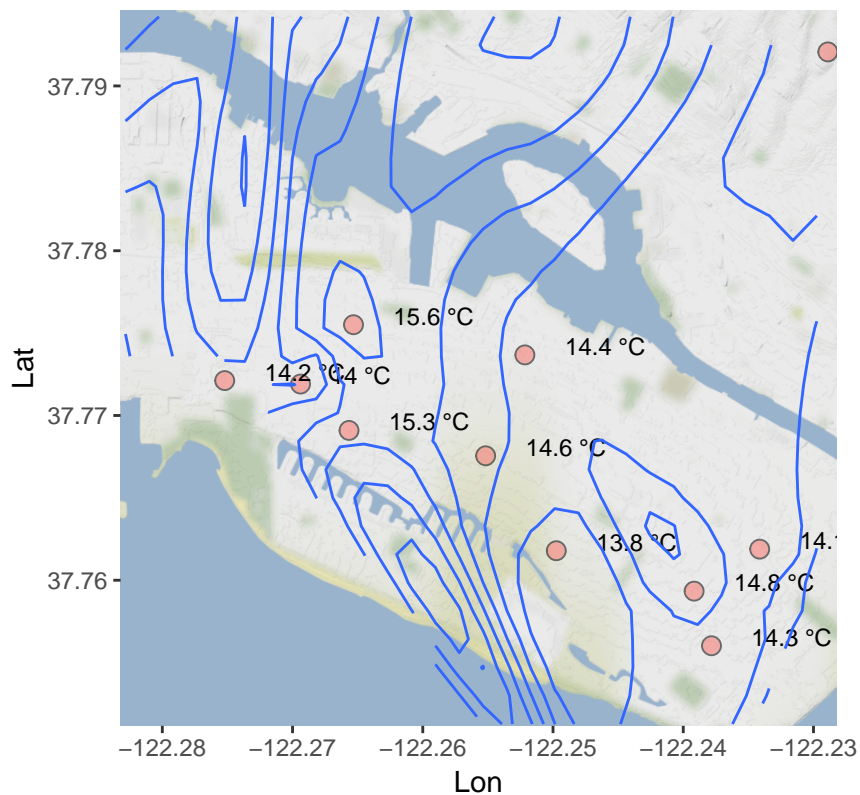
```
## Source : http://tile.stamen.com/terrain-background/14/2626/6332.png
```

```
## Source : http://tile.stamen.com/terrain-background/14/2627/6332.png
```

```
## Source : http://tile.stamen.com/terrain-background/14/2628/6332.png
```

```
## Source : http://tile.stamen.com/terrain-background/14/2629/6332.png
## Source : http://tile.stamen.com/terrain-background/14/2626/6333.png
## Source : http://tile.stamen.com/terrain-background/14/2627/6333.png
## Source : http://tile.stamen.com/terrain-background/14/2628/6333.png
## Source : http://tile.stamen.com/terrain-background/14/2629/6333.png
## Source : http://tile.stamen.com/terrain-background/14/2626/6334.png
## Source : http://tile.stamen.com/terrain-background/14/2627/6334.png
## Source : http://tile.stamen.com/terrain-background/14/2628/6334.png
## Source : http://tile.stamen.com/terrain-background/14/2629/6334.png
## Warning: Removed 7 rows containing missing values (geom_point).
## Warning: Removed 7 rows containing missing values (geom_text).
```

Bay Area Weather – Alameda (2018-05-05)



```
pws_id_selected <- nearby_pws_city(city_name = "Belmont", check_date="2018-05-05")
weather_map(df=pws_id_selected)
```

```
## mptype = "terrain-background" is only available with source = "stamen".
```

```
## resetting to source = "stamen"...
```

```
## Source : https://maps.googleapis.com/maps/api/staticmap?center=37.517678,-122.284111&zoom=14&size=640x640
```

```
## Source : http://tile.stamen.com/terrain-background/14/2625/6346.png
```

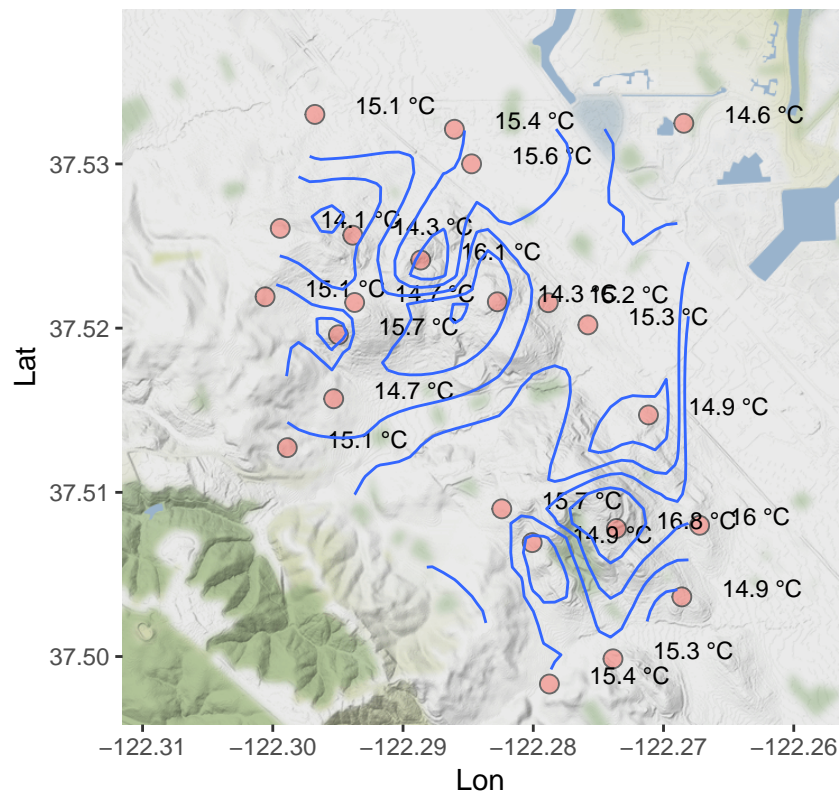
```
## Source : http://tile.stamen.com/terrain-background/14/2626/6346.png
```

```

## Source : http://tile.stamen.com/terrain-background/14/2627/6346.png
## Source : http://tile.stamen.com/terrain-background/14/2625/6347.png
## Source : http://tile.stamen.com/terrain-background/14/2626/6347.png
## Source : http://tile.stamen.com/terrain-background/14/2627/6347.png
## Source : http://tile.stamen.com/terrain-background/14/2625/6348.png
## Source : http://tile.stamen.com/terrain-background/14/2626/6348.png
## Source : http://tile.stamen.com/terrain-background/14/2627/6348.png

```

Bay Area Weather – Belmont (2018–05–05)



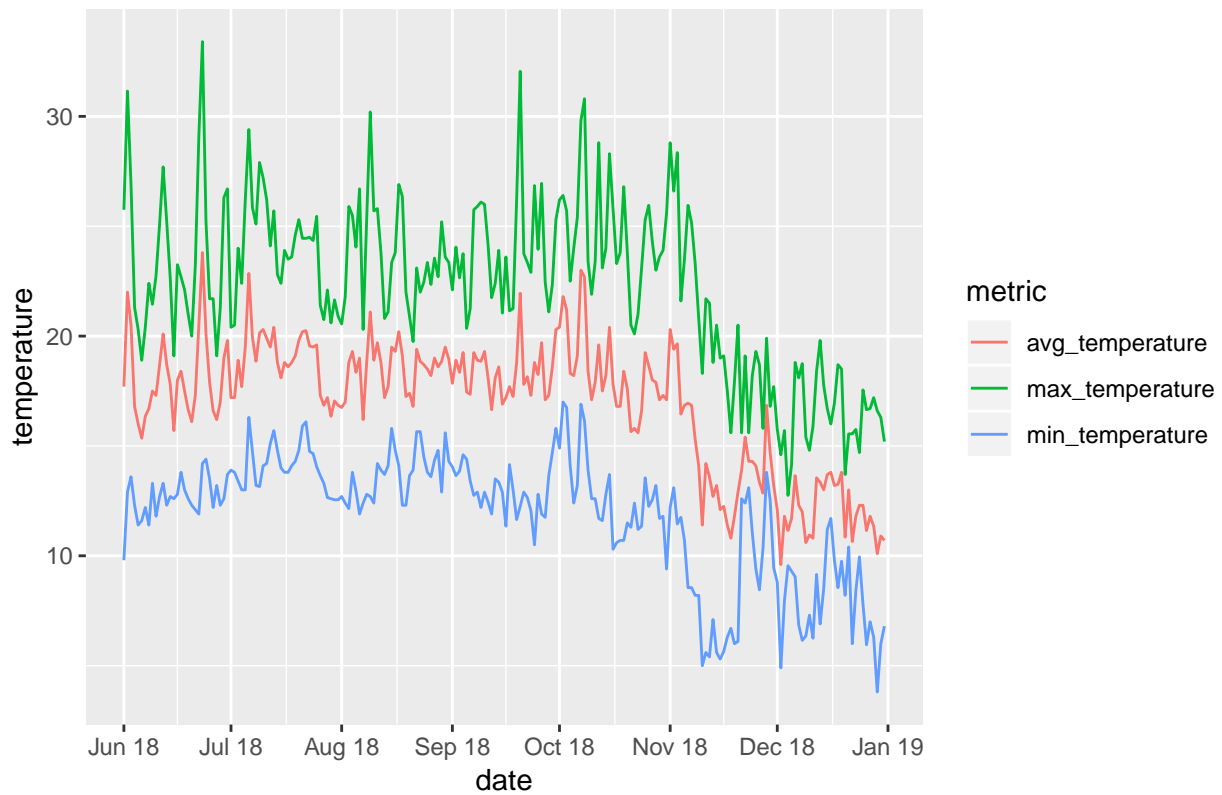
```

#' @return a chart of historical daily tempature with mean, max and min values

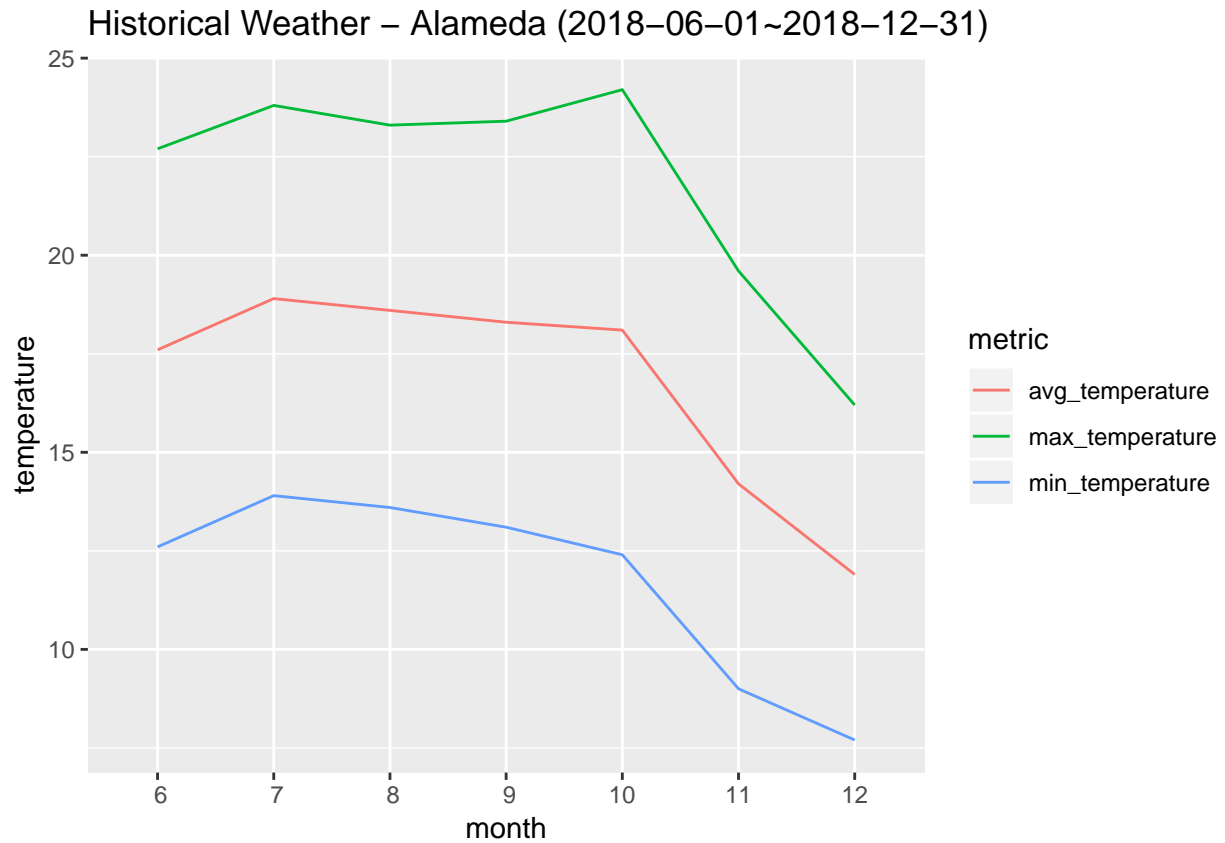
#' ?history_temp_daily
d1="2018-06-01"
d2="2018-12-31"
city="Alameda"
history_weather_tbl=history_weather(city_name = city,start_date=d1,end_date=d2)
history_temp_daily(df=history_weather_tbl)

```

Historical Weather – Alameda (2018-06-01~2018-12-31)



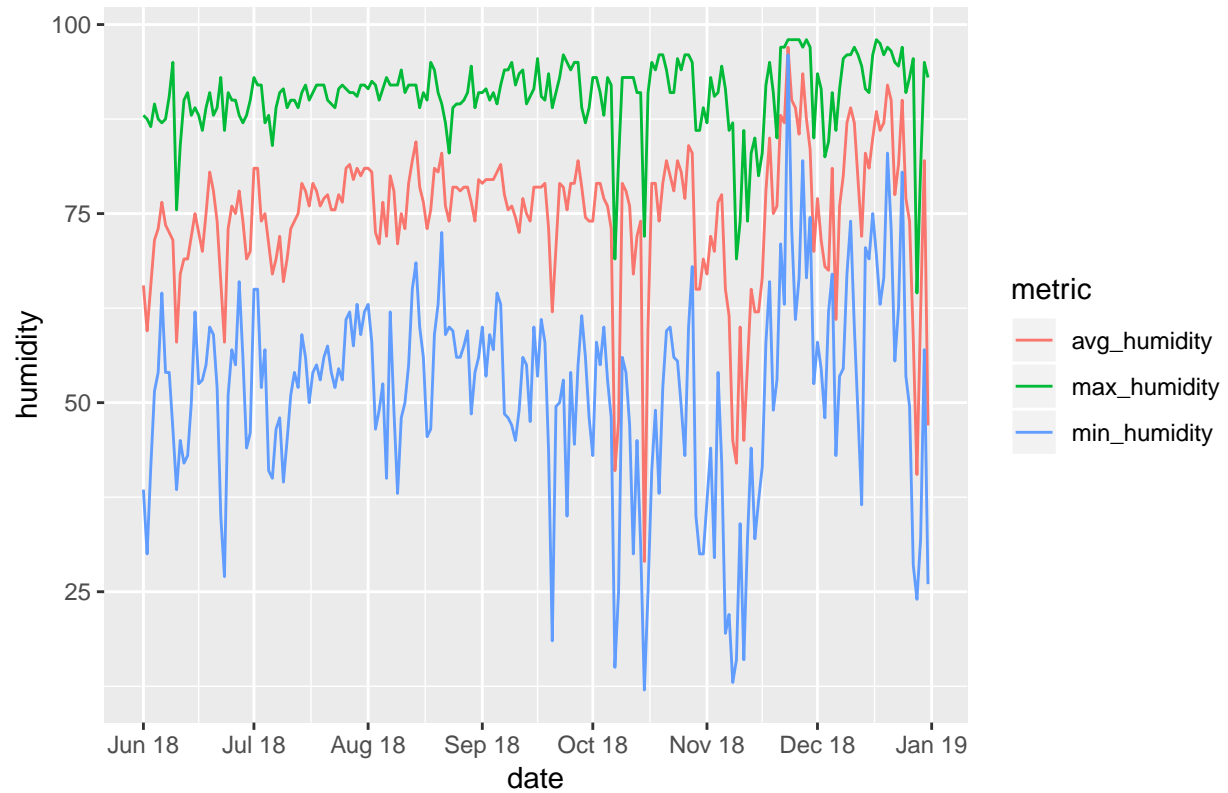
```
#' @return a chart of historical month tempature with mean, max and min values  
  
#' ?history_temp_month  
d1="2018-06-01"  
d2="2018-12-31"  
city="Alameda"  
history_weather_tbl=history_weather(city_name = city,start_date=d1,end_date=d2)  
history_temp_month(df=history_weather_tbl)
```



```
#' @return a chart of historical daily humidity with mean, max and min values

#' ?history_humidity_daily
d1="2018-06-01"
d2="2018-12-31"
city="Alameda"
history_weather_tbl=history_weather(city_name = city,start_date=d1,end_date=d2)
history_humidity_daily(df=history_weather_tbl)
```

Historical Weather – Alameda (2018-06-01~2018-12-31)



#' @return a chart of historical monthly humidity with mean, max and min values

#' ?history_humidity_month

d1="2018-06-01"

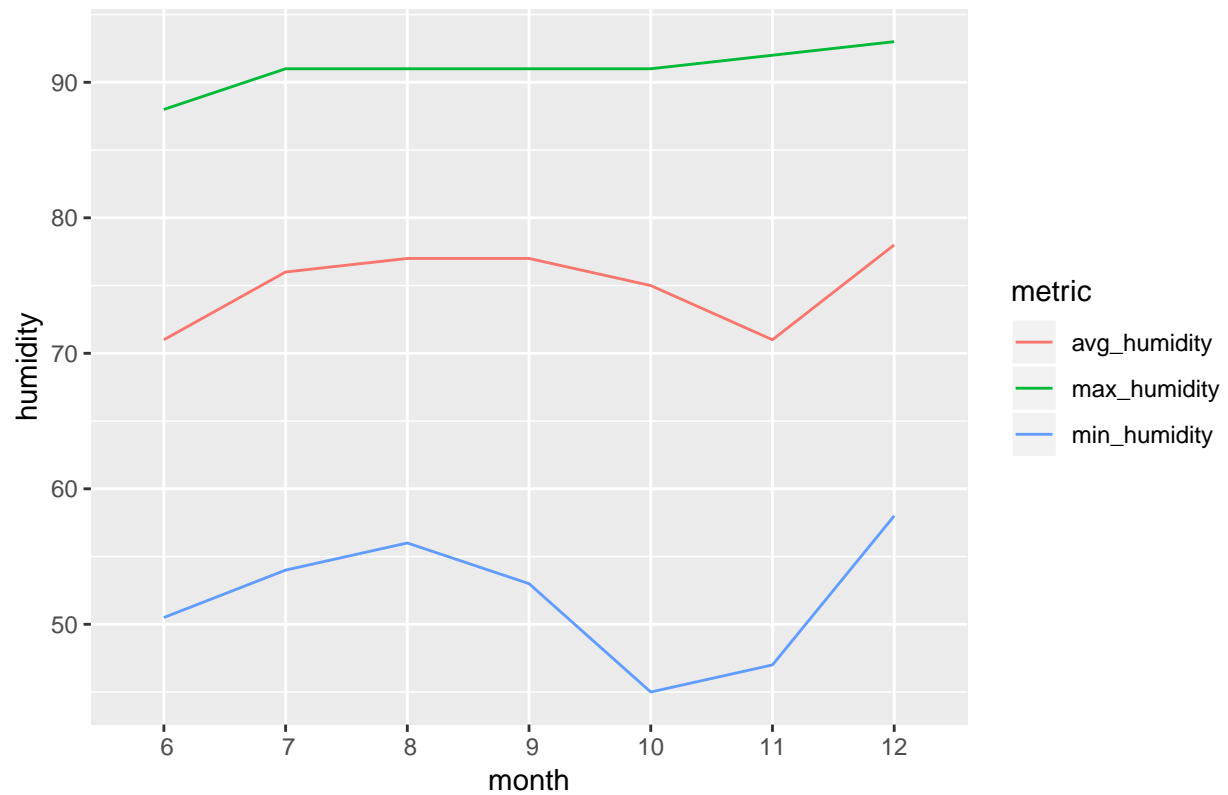
d2="2018-12-31"

city="Alameda"

history_weather_tbl=history_weather(city_name = city,start_date=d1,end_date=d2)

history_humidity_month(df=history_weather_tbl)

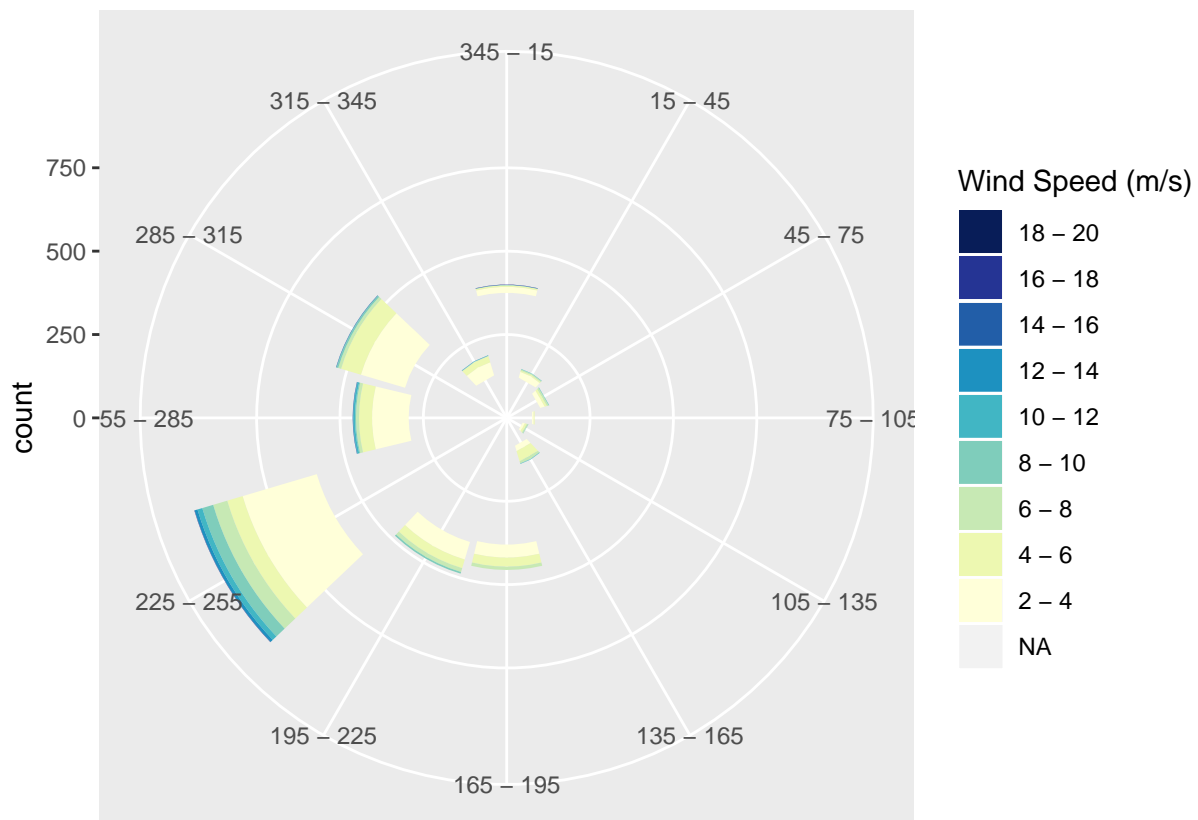
Historical Weather – Alameda (2018-06-01~2018-12-31)

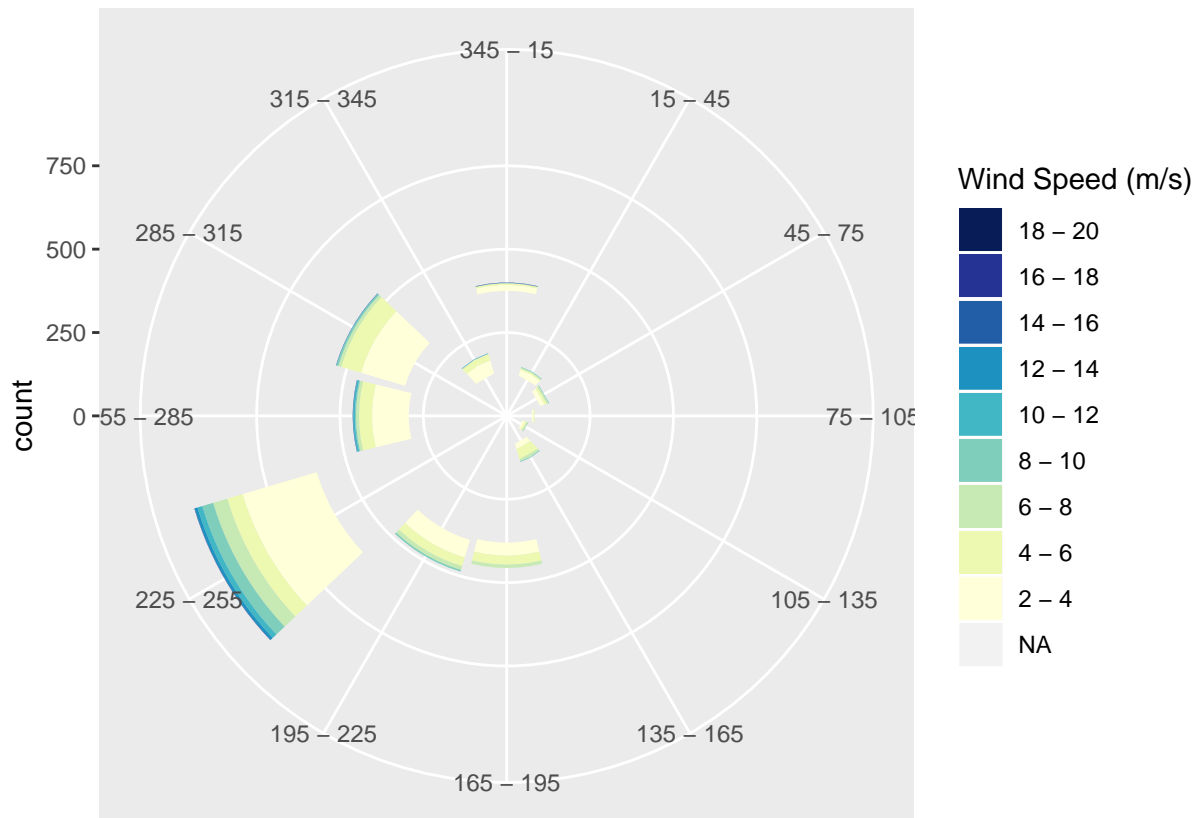


```
#' @return a wind rose
```

```
#' ?weather_windrose
```

```
df=history_weather(city_name = "Alameda",start_date="2018-06-01",end_date="2018-12-31")  
weather_windrose(data = df, spd = "wind_speed", dir = "wind_dir_degrees")
```



```
#' @return shiny UI
#' run shiny UI as below:
#' runWeatherUI()
```