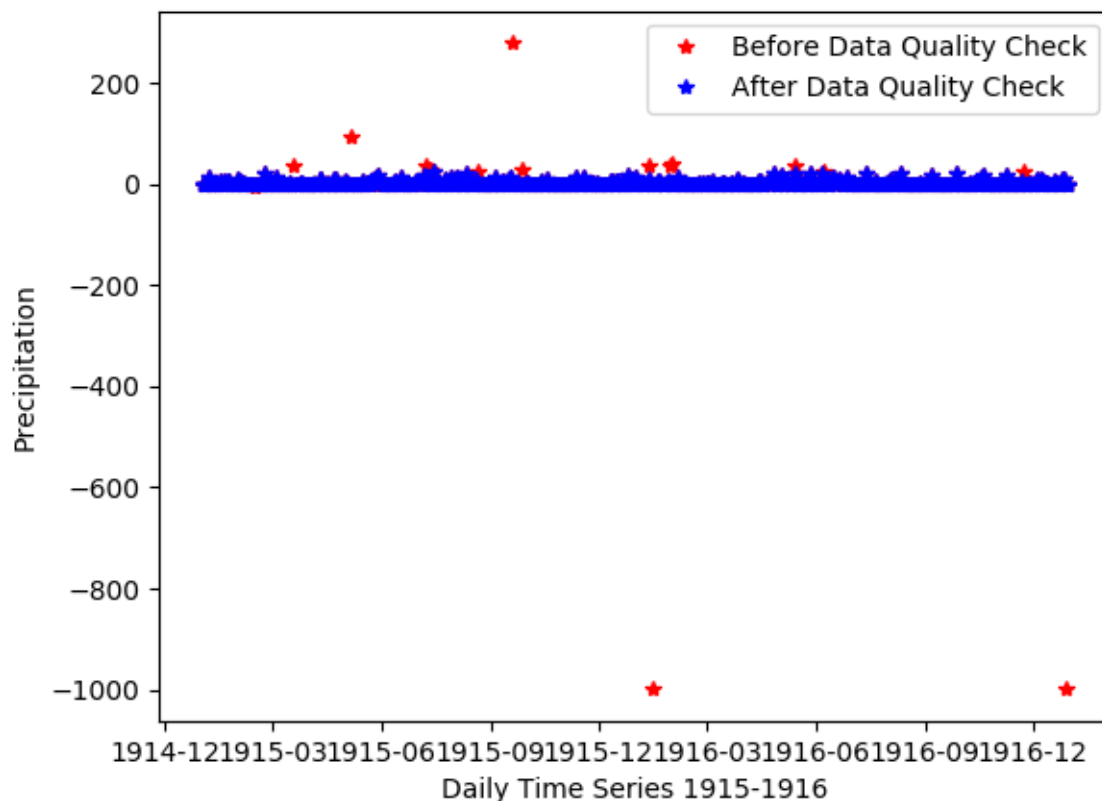


Program Name: Program_09.py
Program Creator: Marissa Cabbage
Date Created: 3/18/2020

This program completes data quality checking on sensor data. Sensor data that is checked includes precipitation (figure 1), maximum temperature (figure 2), minimum temperature (figure 3), and wind speed (figure 4). The first check replaces large negative numbers (-999) with NAN. The second check looks for values that are unrealistic for the time of year in the area. Thus, any temperatures greater than 35 degrees or less than -25 degrees are replaced with NAN values. Also, wind speeds less than 0 or greater than 10 are replaced with NAN. Finally, for the second check, precipitation values less than 0 or greater than 25 are replaced with NAN. The third data check is a logic check; if the maximum temperature value for a day is less than the minimum temperature for the same day, these two values are switched. The last, fourth check is also a logic check; if temperature range between maximum and minimum exceeds 25 degrees, then both maximum and minimum values are set to NAN. The number of data points that were altered due to each check is available in Table 1.

Figure 1: Daily Precipitation data 1915-1916. Red symbols represent data before quality checking, while blue represent data after quality checking. Most Notable are extreme values have been taken out of the data after checking.



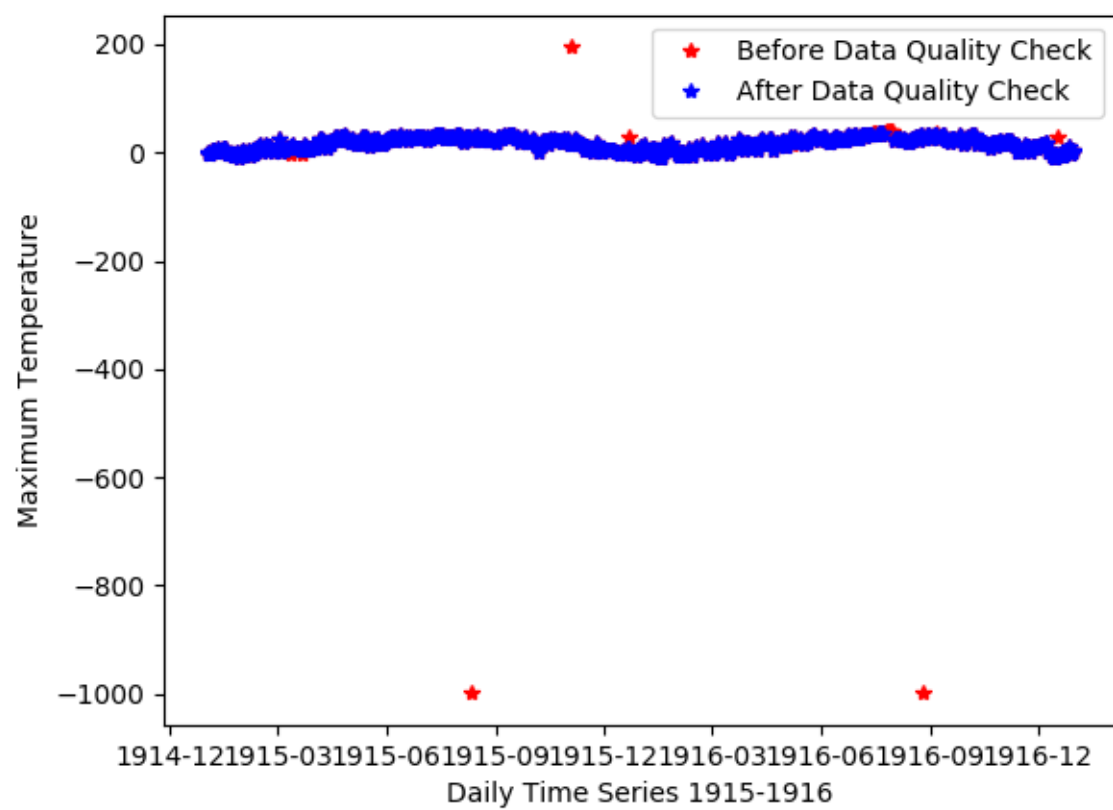


Figure 2: Daily Maximum temperature 1915-1916. Red symbols represent data before quality checking, while blue represent data after quality checking. Most Notable are extreme values have been taken out of the data after checking.

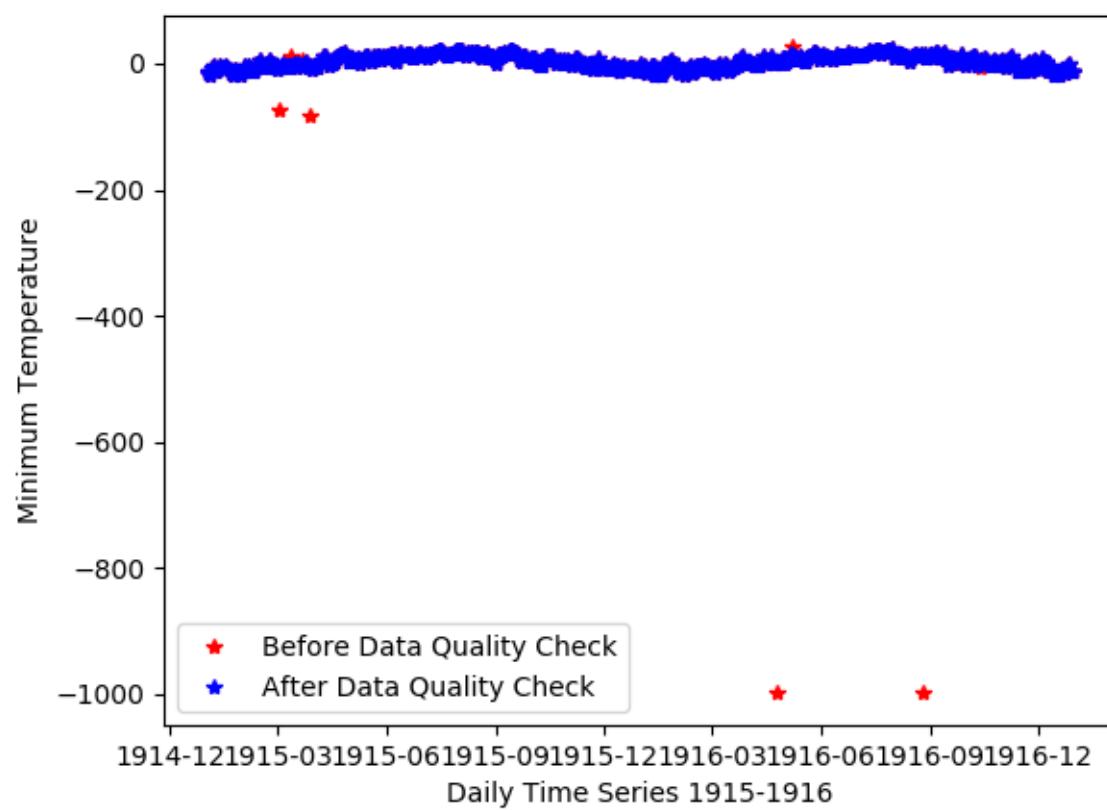


Figure 3: Daily Minimum temperature from 1915-1916. Red symbols represent data before quality checking, while blue represent data after quality checking. Most Notable are extreme values have been taken out of the data after checking.

Table 1: Number of data points altered during each data quality check for each variable.

Precipitation	Max Temp	Min Temp	Wind Speed
2	2	2	0
15	14	2	2
0	4	4	0
0	7	7	0

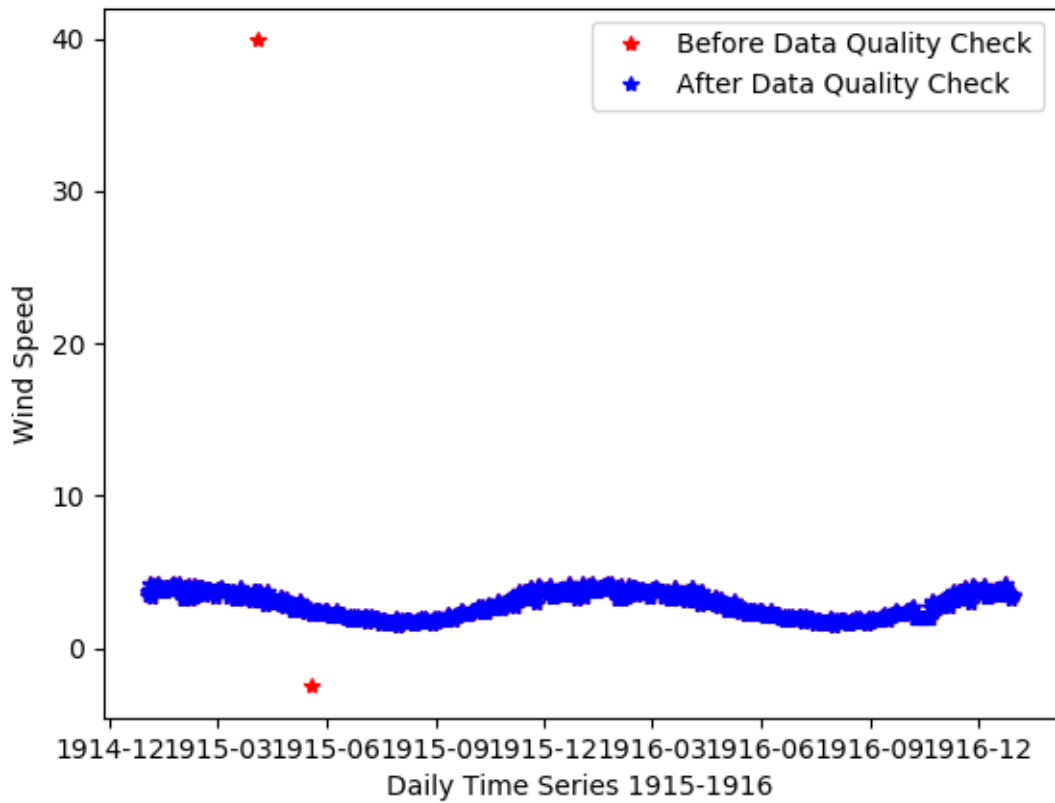


Figure 4: Daily Wind speed form 1915-1916. Red symbols represent data before quality checking, while blur represent data after quality checking. Most Notable are extreme values have been taken out of the data after checking.