

Metadata

Description of program:

The program_09.py can process DataQualityChecking.txt file. The file format for DataQualityChecking.txt must follow columns in order

- date,
- precipitation (mm),
- maximum air temperature (°C)
- minimum air temperature (°C), and
- wind speed (m/s)

The program can find the outliers based on insight and plots against original data. The changed values are saved to ReplacedValues.txt file

Summary of DataQuality checks

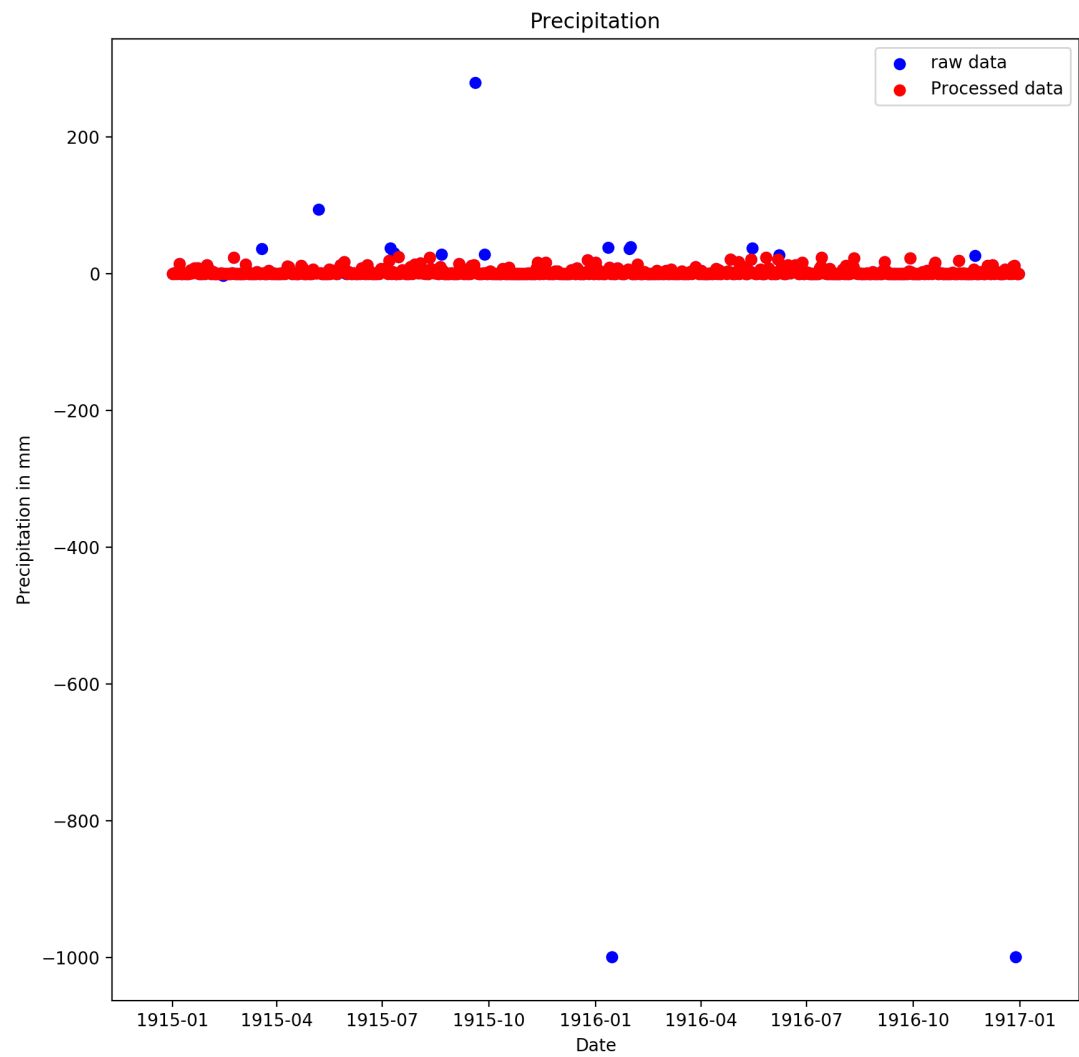
- **Check 1:** Removes No Data values.
 - Replace all values of -999 in this file with the NumPy NaN values (e.g., numpy.NaN or np.NaN).
 - Record the number of values replaced for each data type in the dataframe ReplacedValuesDF with the index "1. No Data"
- **Check 2:** Check for gross errors
 - Apply the following error thresholds: $0 \leq P \leq 25$; $-25 \leq T \leq 35$, $0 \leq WS \leq 10$.
 - Replace values outside this range with NaN.
 - Record the number of values replaced for each data type in the dataframe ReplacedValuesDF with the index "2. Gross Error"
- **Check 3:** Swap Max Temp and Min Temp when Max Temp is less than Min Temp.
 - Check that all values of Max Temp are greater than for Min Temp for the current day's observations.
 - Where they are not, swap the values.
 - Record the number of values replaced for each data type in the dataframe ReplacedValuesDF with the index "3. Swapped"
- **Check 4:** Check for daily temperature range exceedence.
 - Identify days with temperature range (Max Temp minus Min Temp) greater than 25°C.
 - When range is exceeded replace both Tmax and Tmin with NaN.
 - Record the number of values replaced for each data type in the dataframe ReplacedValuesDF with the index "4. Range Fail"

End result :

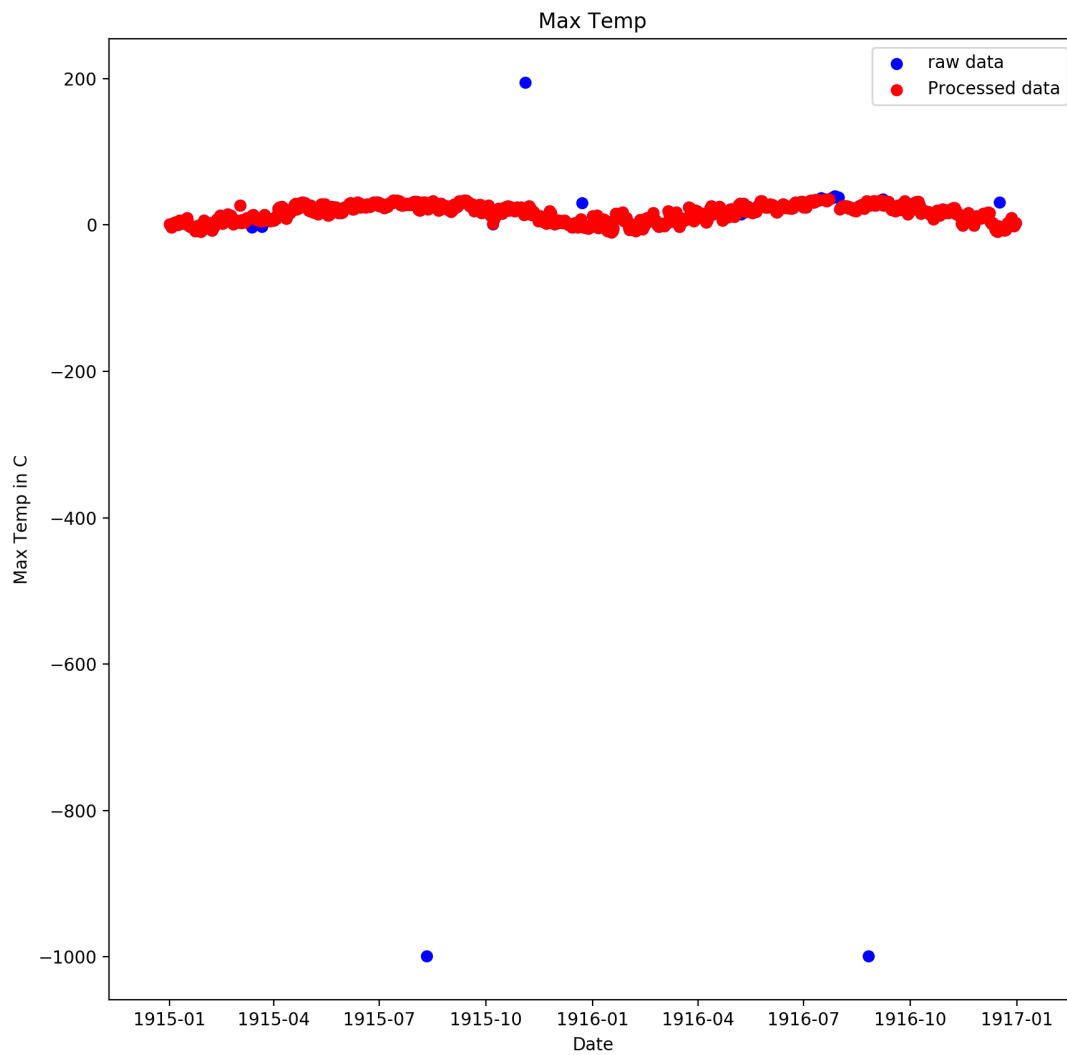
Final changed values counts.....

	Precip	Max Temp	Min Temp	Wind Speed
1. No Data	2.0	2.0	2.0	0.0
2. Gross Error	15.0	14.0	2.0	2.0
3. Swapped	0.0	4.0	4.0	0.0
4. Range Fail	0.0	5.0	5.0	0.0

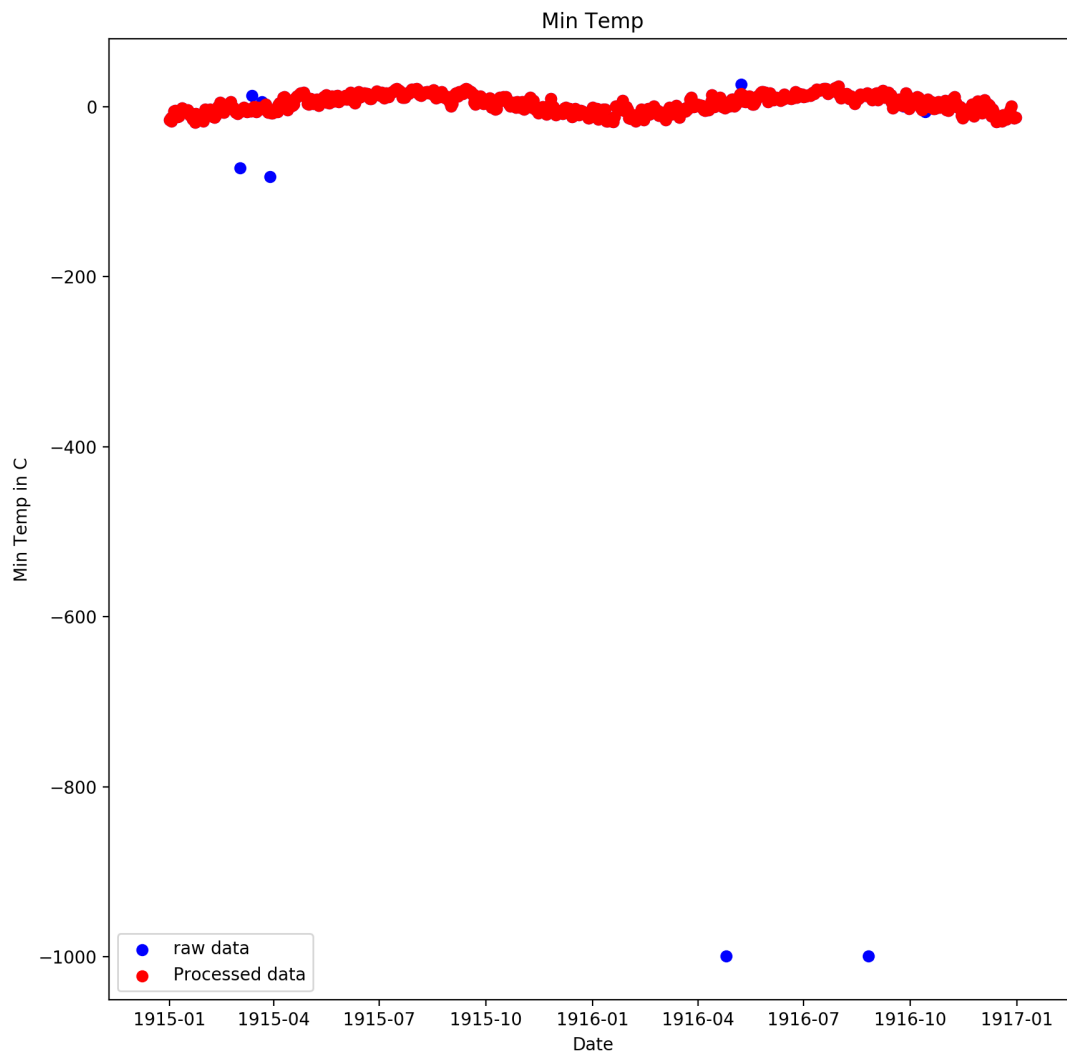
Comparison for Precipitation



Comparison for Max Temp



Comparison for Min Temp



Comparison for Wind Speed

