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"# Hands-on 4: Data-Engineering I - Data Curation\n",

"\n",

"\*Note: This lab session is graded. Complete all the exercises, run your code and upload the ipynb file under assignment Hands-on4\*\n",

"\n",

"\*\*Deadline is Today (02/08), 11:59 PM\*\*"

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"## Preamble: Python Libraries\n",

"- Collection of different modules\n",

"- Modules contain bundle of codes that can be repeatedly used in other programs\n",

"- Typically the library code are available through functions\n",

"- Some libraries are pre-installed in Anaconda and some have to be installed when you use them for the first time\n",

"- You should always check documentation and examples provided by the library"

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"56\n",

"4.605170185988092\n",

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"2.0\n"

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"# Generate a random number between 1, 100\n",

"\n",

"import random\n",

"\n",

"print (random.randint(1,100))\n",

"\n",

"# Compute logarithm of a number\n",

"\n",

"import math\n",

"\n",

"print (math.log(100))\n",

"print (math.log(100, 10))\n",

"\n",

"# Import only a function / object from Library\n",

"\n",

"from math import log\n",

"print (log(100,10))"

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"## Data Collection for Weather Analysis "

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"Let's say we want to perform statistical analysis on weather data for EstesPark, Colorado for the month of January 2023. The data is present at the website: https://www.estesparkweather.net/archive\_reports.php?date=202301. \n",

"\n",

"We need to automatically scrape the website, extract relevant data, transform it and store it somewhere for further analysis. \n",

"\n",

"We would need the following Python libraries : \n",

"\n",

"\*\*BeautifulSoup:\*\* It is a powerful Python library for pulling out data from HTML/XML files. It creates a parse tree for parsed pages that can be used to extract data from HTML/XML files. \n",

"\n",

"\*\*Requests:\*\* It is a Python HTTP library. It makes HTTP requests simpler. we just need to add the URL as an argument and the get() gets all the information from it.\n",

"\n",

"\*\*Pandas:\*\* This is the library for loading and transforming data in Tablular format\n",

"\n",

"While \"requests\" is available by default, we would need to install \*\*BeautifulSoup and Pandas\*\*. "

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"## 0. Open the website and look at the source\n",

"\n",

"1. Goto : https://www.estesparkweather.net/archive\_reports.php?date=202301\n",

"2. Check the page carefully, what kind of data do you need to extract? What kind of values do they contain? Will the data help in your analysis going forward?\n",

"3. Check the source (Typically RightClick->View Page Source). Where is your data of interest in the source? What HTML schema/format does data follow?"

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"## 1. Import libraries (install if needed)"

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"BeautifulSoup and Pandas are already installed and imported\n"

]

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"# Check if beautifulsoup and pandas are already installed\n",

"# If not, install it and then import\n",

"\n",

"try:\n",

" from bs4 import BeautifulSoup\n",

" import pandas\n",

" print (\"BeautifulSoup and Pandas are already installed and imported\")\n",

"except:\n",

" import sys\n",

" !conda install --yes --prefix {sys.prefix} bs4\n",

" !conda install --yes --prefix {sys.prefix} pandas\n",

" from bs4 import BeautifulSoup\n",

" import pandas\n",

" print (\"BeautifulSoup and Pandas were not found. Installed them and imported\")\n",

"\n",

"import requests"

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"## 2. Read the webpage and parse it with BeautifulSoup"

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"Webpage opened successfully...\n",

"Webpage loaded and parsed successfully...\n"

]

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"opened\_webpage = requests.get(\"https://www.estesparkweather.net/archive\_reports.php?date=201904\")\n",

"print (\"Webpage opened successfully...\")\n",

"\n",

"# Initialize a BeautifulSoup object to read and parse the webpage read\n",

"# This is like calling the \_\_init\_\_ function in BeautifulSoup\n",

"bs = BeautifulSoup(opened\_webpage.content, \"html.parser\")\n",

"print (\"Webpage loaded and parsed successfully...\")"

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"## 3. Perform ETL \n",

"\n",

"In the previous class, we discussed ETL, which is a popular data pipeline paradigm. Briefly, the steps are:\n",

"\n",

"\*\*a. Extract:\*\* Get Data from Different Sources Efficiently\n",

"\n",

"\*\*b. Transform:\*\* Perform transformations / calculations on data\n",

"\n",

"\*\*c. Load:\*\* Load the data into the target storage\n",

"\n",

"\n",

"\n",

"\n",

"\n",

"\n"

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"### 3.1. Extract\n",

"\n",

"Let's extract the data of our interest from the webpage. See, how we are "

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Extremes\\n\\n\\nAverage temperature 34.2°F\\n\\n\\nAverage humidity 83%\\n\\n\\nAverage dewpoint 29.4°F\\n\\n\\nAverage barometer 29.9 in.\\n\\n\\nAverage windspeed 2.5 mph\\n\\n\\nAverage gustspeed 3.8 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.08 in.\\n\\n\\nRainfall for year 1.16 in.\\n\\n\\nMaximum rain per minute 0.01 in. on day 02 at time 23:56\\n\\n\\nMaximum temperature 39.6°F on day 02 at time 17:33\\n\\n\\nMinimum temperature 28.8°F on day 02 at time 06:02\\n\\n\\nMaximum humidity 90% on day 02 at time 23:59\\n\\n\\nMinimum humidity 69% on day 02 at time 17:53\\n\\n\\nMaximum pressure 29.960 in. on day 02 at time 00:06\\n\\n\\nMinimum pressure 29.785 in. on day 02 at time 23:59\\n\\n\\nMaximum windspeed 10.4 mph on day 02 at time 15:25\\n\\n\\nMaximum gust speed 12.7 mph from 283 °(WNW) on day 02 at time 12:40\\n\\n\\nMaximum heat index 39.6°F on day 02 at time 17:33\\n\\n', '\\n\\nApr 3 Average and Extremes\\n\\n\\nAverage temperature 39.3°F\\n\\n\\nAverage humidity 67%\\n\\n\\nAverage dewpoint 27.3°F\\n\\n\\nAverage barometer 29.7 in.\\n\\n\\nAverage windspeed 4.1 mph\\n\\n\\nAverage gustspeed 6.0 mph\\n\\n\\nAverage direction 283° (WNW)\\n\\n\\nRainfall for month 0.10 in.\\n\\n\\nRainfall for year 1.18 in.\\n\\n\\nMaximum rain per minute 0.01 in. on day 03 at time 09:08\\n\\n\\nMaximum temperature 50.7°F on day 03 at time 18:08\\n\\n\\nMinimum temperature 30.7°F on day 03 at time 07:35\\n\\n\\nMaximum humidity 92% on day 03 at time 06:42\\n\\n\\nMinimum humidity 27% on day 03 at time 18:22\\n\\n\\nMaximum pressure 29.863 in. on day 03 at time 23:58\\n\\n\\nMinimum pressure 29.669 in. on day 03 at time 14:56\\n\\n\\nMaximum windspeed 17.3 mph on day 03 at time 13:06\\n\\n\\nMaximum gust speed 26.5 mph from 284 °(WNW) on day 03 at time 13:05\\n\\n\\nMaximum heat index 50.7°F on day 03 at time 18:08\\n\\n', '\\n\\nApr 4 Average and Extremes\\n\\n\\nAverage temperature 43.6°F\\n\\n\\nAverage humidity 46%\\n\\n\\nAverage dewpoint 23.4°F\\n\\n\\nAverage barometer 29.8 in.\\n\\n\\nAverage windspeed 6.3 mph\\n\\n\\nAverage gustspeed 9.0 mph\\n\\n\\nAverage direction 283° (WNW)\\n\\n\\nRainfall for month 0.10 in.\\n\\n\\nRainfall for year 1.18 in.\\n\\n\\nMaximum rain per minute 0.00 in. on day 04 at time 23:59\\n\\n\\nMaximum temperature 53.9°F on day 04 at time 15:43\\n\\n\\nMinimum temperature 30.9°F on day 04 at time 01:09\\n\\n\\nMaximum humidity 87% on day 04 at time 01:14\\n\\n\\nMinimum humidity 30% on day 04 at time 16:10\\n\\n\\nMaximum pressure 29.969 in. on day 04 at time 11:18\\n\\n\\nMinimum pressure 29.743 in. on day 04 at time 16:14\\n\\n\\nMaximum windspeed 16.1 mph on day 04 at time 15:50\\n\\n\\nMaximum gust speed 26.5 mph from 281 °( W ) on day 04 at time 04:29\\n\\n\\nMaximum heat index 53.9°F on day 04 at time 15:43\\n\\n', '\\n\\nApr 5 Average and Extremes\\n\\n\\nAverage temperature 45.8°F\\n\\n\\nAverage humidity 38%\\n\\n\\nAverage dewpoint 17.7°F\\n\\n\\nAverage barometer 29.7 in.\\n\\n\\nAverage windspeed 4.0 mph\\n\\n\\nAverage gustspeed 6.3 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.10 in.\\n\\n\\nRainfall for year 1.18 in.\\n\\n\\nMaximum rain per minute 0.00 in. on day 05 at time 23:59\\n\\n\\nMaximum temperature 60.5°F on day 05 at time 16:19\\n\\n\\nMinimum temperature 31.6°F on day 05 at time 03:30\\n\\n\\nMaximum humidity 72% on day 05 at time 04:14\\n\\n\\nMinimum humidity 14% on day 05 at time 17:29\\n\\n\\nMaximum pressure 29.867 in. on day 05 at time 00:08\\n\\n\\nMinimum pressure 29.560 in. on day 05 at time 20:19\\n\\n\\nMaximum windspeed 15.0 mph on day 05 at time 14:08\\n\\n\\nMaximum gust speed 25.3 mph from 280 °( W ) on day 05 at time 13:39\\n\\n\\nMaximum heat index 60.5°F on day 05 at time 16:19\\n\\n', '\\n\\nApr 6 Average and Extremes\\n\\n\\nAverage temperature 44.1°F\\n\\n\\nAverage humidity 42%\\n\\n\\nAverage dewpoint 21.3°F\\n\\n\\nAverage barometer 29.7 in.\\n\\n\\nAverage windspeed 6.1 mph\\n\\n\\nAverage gustspeed 9.1 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.10 in.\\n\\n\\nRainfall for year 1.18 in.\\n\\n\\nMaximum rain per minute 0.00 in. on day 06 at time 23:59\\n\\n\\nMaximum temperature 58.1°F on day 06 at time 13:11\\n\\n\\nMinimum temperature 31.2°F on day 06 at time 04:36\\n\\n\\nMaximum humidity 64% on day 06 at time 22:48\\n\\n\\nMinimum humidity 24% on day 06 at time 13:22\\n\\n\\nMaximum pressure 29.756 in. on day 06 at time 22:52\\n\\n\\nMinimum pressure 29.600 in. on day 06 at time 13:14\\n\\n\\nMaximum windspeed 24.2 mph on day 06 at time 17:48\\n\\n\\nMaximum gust speed 35.7 mph from 281 °( W ) on day 06 at time 22:16\\n\\n\\nMaximum heat index 58.1°F on day 06 at time 13:11\\n\\n', '\\n\\nApr 7 Average and Extremes\\n\\n\\nAverage temperature 47.9°F\\n\\n\\nAverage humidity 28%\\n\\n\\nAverage dewpoint 15.9°F\\n\\n\\nAverage barometer 29.8 in.\\n\\n\\nAverage windspeed 11.0 mph\\n\\n\\nAverage gustspeed 15.7 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.10 in.\\n\\n\\nRainfall for year 1.18 in.\\n\\n\\nMaximum rain per minute 0.00 in. on day 07 at time 23:59\\n\\n\\nMaximum temperature 60.4°F on day 07 at time 16:45\\n\\n\\nMinimum temperature 37.2°F on day 07 at time 05:29\\n\\n\\nMaximum humidity 43% on day 07 at time 03:11\\n\\n\\nMinimum humidity 18% on day 07 at time 16:24\\n\\n\\nMaximum pressure 29.937 in. on day 07 at time 09:16\\n\\n\\nMinimum pressure 29.673 in. on day 07 at time 00:23\\n\\n\\nMaximum windspeed 21.9 mph on day 07 at time 23:22\\n\\n\\nMaximum gust speed 35.7 mph from 281 °( W ) on day 07 at time 02:51\\n\\n\\nMaximum heat index 60.4°F on day 07 at time 16:45\\n\\n', '\\n\\nApr 8 Average and Extremes\\n\\n\\nAverage temperature 52.2°F\\n\\n\\nAverage humidity 29%\\n\\n\\nAverage dewpoint 20.3°F\\n\\n\\nAverage barometer 29.8 in.\\n\\n\\nAverage windspeed 7.9 mph\\n\\n\\nAverage gustspeed 11.8 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.10 in.\\n\\n\\nRainfall for year 1.18 in.\\n\\n\\nMaximum rain per minute 0.00 in. on day 08 at time 23:59\\n\\n\\nMaximum temperature 64.7°F on day 08 at time 14:17\\n\\n\\nMinimum temperature 43.2°F on day 08 at time 23:59\\n\\n\\nMaximum humidity 43% on day 08 at time 23:56\\n\\n\\nMinimum humidity 16% on day 08 at time 15:01\\n\\n\\nMaximum pressure 29.903 in. on day 08 at time 06:23\\n\\n\\nMinimum pressure 29.721 in. on day 08 at time 15:10\\n\\n\\nMaximum windspeed 18.4 mph on day 08 at time 12:11\\n\\n\\nMaximum gust speed 33.4 mph from 283 °(WNW) on day 08 at time 00:17\\n\\n\\nMaximum heat index 64.7°F on day 08 at time 14:17\\n\\n', '\\n\\nApr 9 Average and Extremes\\n\\n\\nAverage temperature 52.5°F\\n\\n\\nAverage humidity 28%\\n\\n\\nAverage dewpoint 17.2°F\\n\\n\\nAverage barometer 29.5 in.\\n\\n\\nAverage windspeed 8.3 mph\\n\\n\\nAverage gustspeed 11.8 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.10 in.\\n\\n\\nRainfall for year 1.18 in.\\n\\n\\nMaximum rain per minute 0.00 in. on day 09 at time 23:59\\n\\n\\nMaximum temperature 65.6°F on day 09 at time 15:12\\n\\n\\nMinimum temperature 35.9°F on day 09 at time 04:30\\n\\n\\nMaximum humidity 59% on day 09 at time 04:33\\n\\n\\nMinimum humidity 12% on day 09 at time 17:55\\n\\n\\nMaximum pressure 29.815 in. on day 09 at time 00:10\\n\\n\\nMinimum pressure 29.234 in. on day 09 at time 21:23\\n\\n\\nMaximum windspeed 25.3 mph on day 09 at time 15:53\\n\\n\\nMaximum gust speed 34.5 mph from 283 °(WNW) on day 09 at time 11:19\\n\\n\\nMaximum heat index 65.6°F on day 09 at time 15:12\\n\\n', '\\n\\nApr 10 Average and Extremes\\n\\n\\nAverage temperature 31.9°F\\n\\n\\nAverage humidity 78%\\n\\n\\nAverage dewpoint 24.9°F\\n\\n\\nAverage barometer 29.4 in.\\n\\n\\nAverage windspeed 5.2 mph\\n\\n\\nAverage gustspeed 8.3 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.23 in.\\n\\n\\nRainfall for year 1.31 in.\\n\\n\\nMaximum rain per minute 0.01 in. on day 10 at time 16:34\\n\\n\\nMaximum temperature 49.6°F on day 10 at time 00:11\\n\\n\\nMinimum temperature 19.2°F on day 10 at time 23:59\\n\\n\\nMaximum humidity 93% on day 10 at time 13:38\\n\\n\\nMinimum humidity 33% on day 10 at time 00:07\\n\\n\\nMaximum pressure 29.745 in. on day 10 at time 23:17\\n\\n\\nMinimum pressure 29.105 in. on day 10 at time 04:49\\n\\n\\nMaximum windspeed 18.4 mph on day 10 at time 20:51\\n\\n\\nMaximum gust speed 34.5 mph from 281 °( W ) on day 10 at time 02:11\\n\\n\\nMaximum heat index 49.6°F on day 10 at time 00:11\\n\\n', '\\n\\nApr 11 Average and Extremes\\n\\n\\nAverage temperature 24.5°F\\n\\n\\nAverage humidity 56%\\n\\n\\nAverage dewpoint 10.2°F\\n\\n\\nAverage barometer 29.7 in.\\n\\n\\nAverage windspeed 5.0 mph\\n\\n\\nAverage gustspeed 8.0 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.31 in.\\n\\n\\nRainfall for year 1.39 in.\\n\\n\\nMaximum rain per minute 0.01 in. on day 11 at time 15:00\\n\\n\\nMaximum temperature 32.4°F on day 11 at time 14:59\\n\\n\\nMinimum temperature 18.3°F on day 11 at time 01:56\\n\\n\\nMaximum humidity 85% on day 11 at time 02:18\\n\\n\\nMinimum humidity 38% on day 11 at time 20:48\\n\\n\\nMaximum pressure 29.787 in. on day 11 at time 21:13\\n\\n\\nMinimum pressure 29.644 in. on day 11 at time 13:14\\n\\n\\nMaximum windspeed 15.0 mph on day 11 at time 14:18\\n\\n\\nMaximum gust speed 27.6 mph from 284 °(WNW) on day 11 at time 07:06\\n\\n\\nMaximum heat index 32.4°F on day 11 at time 14:59\\n\\n', '\\n\\nApr 12 Average and Extremes\\n\\n\\nAverage temperature 24.3°F\\n\\n\\nAverage humidity 69%\\n\\n\\nAverage dewpoint 15.4°F\\n\\n\\nAverage barometer 29.8 in.\\n\\n\\nAverage windspeed 3.0 mph\\n\\n\\nAverage gustspeed 5.0 mph\\n\\n\\nAverage direction 283° (WNW)\\n\\n\\nRainfall for month 0.35 in.\\n\\n\\nRainfall for year 1.43 in.\\n\\n\\nMaximum rain per minute 0.01 in. on day 12 at time 13:15\\n\\n\\nMaximum temperature 33.4°F on day 12 at time 09:34\\n\\n\\nMinimum temperature 12.6°F on day 12 at time 06:53\\n\\n\\nMaximum humidity 82% on day 12 at time 19:57\\n\\n\\nMinimum humidity 45% on day 12 at time 09:31\\n\\n\\nMaximum pressure 29.993 in. on day 12 at time 19:14\\n\\n\\nMinimum pressure 29.693 in. on day 12 at time 02:00\\n\\n\\nMaximum windspeed 11.5 mph on day 12 at time 13:01\\n\\n\\nMaximum gust speed 18.4 mph from 281 °( W ) on day 12 at time 12:08\\n\\n\\nMaximum heat index 33.4°F on day 12 at time 09:34\\n\\n', '\\n\\nApr 13 Average and Extremes\\n\\n\\nAverage temperature 29.3°F\\n\\n\\nAverage humidity 75%\\n\\n\\nAverage dewpoint 22.1°F\\n\\n\\nAverage barometer 29.9 in.\\n\\n\\nAverage windspeed 2.4 mph\\n\\n\\nAverage gustspeed 4.4 mph\\n\\n\\nAverage direction 283° (WNW)\\n\\n\\nRainfall for month 0.36 in.\\n\\n\\nRainfall for year 1.44 in.\\n\\n\\nMaximum rain per minute 0.01 in. on day 13 at time 08:30\\n\\n\\nMaximum temperature 38.5°F on day 13 at time 16:24\\n\\n\\nMinimum temperature 23.3°F on day 13 at time 06:06\\n\\n\\nMaximum humidity 89% on day 13 at time 03:49\\n\\n\\nMinimum humidity 44% on day 13 at time 23:59\\n\\n\\nMaximum pressure 30.011 in. on day 13 at time 11:00\\n\\n\\nMinimum pressure 29.831 in. on day 13 at time 23:52\\n\\n\\nMaximum windspeed 16.1 mph on day 13 at time 23:53\\n\\n\\nMaximum gust speed 26.5 mph from 284 °(WNW) on day 13 at time 23:52\\n\\n\\nMaximum heat index 38.5°F on day 13 at time 16:24\\n\\n', '\\n\\nApr 14 Average and Extremes\\n\\n\\nAverage temperature 42.0°F\\n\\n\\nAverage humidity 38%\\n\\n\\nAverage dewpoint 17.9°F\\n\\n\\nAverage barometer 29.6 in.\\n\\n\\nAverage windspeed 12.6 mph\\n\\n\\nAverage gustspeed 18.7 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.36 in.\\n\\n\\nRainfall for year 1.44 in.\\n\\n\\nMaximum rain per minute 0.00 in. on day 14 at time 23:59\\n\\n\\nMaximum temperature 50.8°F on day 14 at time 15:02\\n\\n\\nMinimum temperature 32.8°F on day 14 at time 00:08\\n\\n\\nMaximum humidity 47% on day 14 at time 04:08\\n\\n\\nMinimum humidity 28% on day 14 at time 12:31\\n\\n\\nMaximum pressure 29.834 in. on day 14 at time 00:01\\n\\n\\nMinimum pressure 29.406 in. on day 14 at time 17:10\\n\\n\\nMaximum windspeed 29.9 mph on day 14 at time 13:24\\n\\n\\nMaximum gust speed 42.6 mph from 283 °(WNW) on day 14 at time 15:51\\n\\n\\nMaximum heat index 50.8°F on day 14 at time 15:02\\n\\n', '\\n\\nApr 15 Average and Extremes\\n\\n\\nAverage temperature 50.3°F\\n\\n\\nAverage humidity 33%\\n\\n\\nAverage dewpoint 21.4°F\\n\\n\\nAverage barometer 29.5 in.\\n\\n\\nAverage windspeed 8.0 mph\\n\\n\\nAverage gustspeed 11.1 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.36 in.\\n\\n\\nRainfall for year 1.44 in.\\n\\n\\nMaximum rain per minute 0.00 in. on day 15 at time 23:59\\n\\n\\nMaximum temperature 60.4°F on day 15 at time 16:24\\n\\n\\nMinimum temperature 38.8°F on day 15 at time 23:59\\n\\n\\nMaximum humidity 71% on day 15 at time 23:59\\n\\n\\nMinimum humidity 21% on day 15 at time 17:59\\n\\n\\nMaximum pressure 29.598 in. on day 15 at time 22:58\\n\\n\\nMinimum pressure 29.373 in. on day 15 at time 04:52\\n\\n\\nMaximum windspeed 23.0 mph on day 15 at time 15:04\\n\\n\\nMaximum gust speed 32.2 mph from 247 °(WSW) on day 15 at time 15:03\\n\\n\\nMaximum heat index 60.4°F on day 15 at time 16:24\\n\\n', '\\n\\nApr 16 Average and Extremes\\n\\n\\nAverage temperature 44.9°F\\n\\n\\nAverage humidity 55%\\n\\n\\nAverage dewpoint 27.8°F\\n\\n\\nAverage barometer 29.6 in.\\n\\n\\nAverage windspeed 3.4 mph\\n\\n\\nAverage gustspeed 5.4 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.36 in.\\n\\n\\nRainfall for year 1.44 in.\\n\\n\\nMaximum rain per minute 0.00 in. on day 16 at time 23:59\\n\\n\\nMaximum temperature 59.5°F on day 16 at time 12:22\\n\\n\\nMinimum temperature 31.2°F on day 16 at time 06:56\\n\\n\\nMaximum humidity 86% on day 16 at time 07:30\\n\\n\\nMinimum humidity 20% on day 16 at time 12:48\\n\\n\\nMaximum pressure 29.673 in. on day 16 at time 07:23\\n\\n\\nMinimum pressure 29.429 in. on day 16 at time 23:52\\n\\n\\nMaximum windspeed 13.8 mph on day 16 at time 23:25\\n\\n\\nMaximum gust speed 19.6 mph from 283 °(WNW) on day 16 at time 16:25\\n\\n\\nMaximum heat index 59.5°F on day 16 at time 12:22\\n\\n', '\\n\\nApr 17 Average and Extremes\\n\\n\\nAverage temperature 46.9°F\\n\\n\\nAverage humidity 42%\\n\\n\\nAverage dewpoint 23.6°F\\n\\n\\nAverage barometer 29.6 in.\\n\\n\\nAverage windspeed 5.7 mph\\n\\n\\nAverage gustspeed 8.9 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.36 in.\\n\\n\\nRainfall for year 1.44 in.\\n\\n\\nMaximum rain per minute 0.00 in. on day 17 at time 23:59\\n\\n\\nMaximum temperature 58.4°F on day 17 at time 17:16\\n\\n\\nMinimum temperature 36.5°F on day 17 at time 06:44\\n\\n\\nMaximum humidity 67% on day 17 at time 11:33\\n\\n\\nMinimum humidity 18% on day 17 at time 17:17\\n\\n\\nMaximum pressure 29.837 in. on day 17 at time 23:55\\n\\n\\nMinimum pressure 29.422 in. on day 17 at time 00:01\\n\\n\\nMaximum windspeed 16.1 mph on day 17 at time 20:57\\n\\n\\nMaximum gust speed 24.2 mph from 281 °( W ) on day 17 at time 18:38\\n\\n\\nMaximum heat index 58.4°F on day 17 at time 17:16\\n\\n', '\\n\\nApr 18 Average and Extremes\\n\\n\\nAverage temperature 46.0°F\\n\\n\\nAverage humidity 35%\\n\\n\\nAverage dewpoint 18.3°F\\n\\n\\nAverage barometer 29.9 in.\\n\\n\\nAverage windspeed 5.8 mph\\n\\n\\nAverage gustspeed 9.6 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.36 in.\\n\\n\\nRainfall for year 1.44 in.\\n\\n\\nMaximum rain per minute 0.00 in. on day 18 at time 23:59\\n\\n\\nMaximum temperature 57.6°F on day 18 at time 17:04\\n\\n\\nMinimum temperature 32.9°F on day 18 at time 05:03\\n\\n\\nMaximum humidity 62% on day 18 at time 00:43\\n\\n\\nMinimum humidity 19% on day 18 at time 16:47\\n\\n\\nMaximum pressure 29.999 in. on day 18 at time 23:52\\n\\n\\nMinimum pressure 29.779 in. on day 18 at time 04:28\\n\\n\\nMaximum windspeed 16.1 mph on day 18 at time 14:32\\n\\n\\nMaximum gust speed 31.1 mph from 283 °(WNW) on day 18 at time 15:20\\n\\n\\nMaximum heat index 57.6°F on day 18 at time 17:04\\n\\n', '\\n\\nApr 19 Average and Extremes\\n\\n\\nAverage temperature 52.4°F\\n\\n\\nAverage humidity 32%\\n\\n\\nAverage dewpoint 20.6°F\\n\\n\\nAverage barometer 29.8 in.\\n\\n\\nAverage windspeed 4.9 mph\\n\\n\\nAverage gustspeed 7.6 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.36 in.\\n\\n\\nRainfall for year 1.44 in.\\n\\n\\nMaximum rain per minute 0.00 in. on day 19 at time 23:59\\n\\n\\nMaximum temperature 69.1°F on day 19 at time 15:22\\n\\n\\nMinimum temperature 31.8°F on day 19 at time 02:21\\n\\n\\nMaximum humidity 67% on day 19 at time 02:19\\n\\n\\nMinimum humidity 12% on day 19 at time 15:26\\n\\n\\nMaximum pressure 30.023 in. on day 19 at time 01:05\\n\\n\\nMinimum pressure 29.652 in. on day 19 at time 19:17\\n\\n\\nMaximum windspeed 19.6 mph on day 19 at time 08:38\\n\\n\\nMaximum gust speed 31.1 mph from 284 °(WNW) on day 19 at time 07:41\\n\\n\\nMaximum heat index 72.4°F on day 19 at time 15:36\\n\\n', '\\n\\nApr 20 Average and Extremes\\n\\n\\nAverage temperature 53.1°F\\n\\n\\nAverage humidity 30%\\n\\n\\nAverage dewpoint 19.5°F\\n\\n\\nAverage barometer 29.6 in.\\n\\n\\nAverage windspeed 5.9 mph\\n\\n\\nAverage gustspeed 8.7 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.36 in.\\n\\n\\nRainfall for year 1.44 in.\\n\\n\\nMaximum rain per minute 0.00 in. on day 20 at time 23:59\\n\\n\\nMaximum temperature 69.4°F on day 20 at time 14:32\\n\\n\\nMinimum temperature 33.7°F on day 20 at time 02:20\\n\\n\\nMaximum humidity 64% on day 20 at time 02:39\\n\\n\\nMinimum humidity 10% on day 20 at time 14:25\\n\\n\\nMaximum pressure 29.766 in. on day 20 at time 00:24\\n\\n\\nMinimum pressure 29.371 in. on day 20 at time 15:59\\n\\n\\nMaximum windspeed 23.0 mph on day 20 at time 17:06\\n\\n\\nMaximum gust speed 34.5 mph from 281 °( W ) on day 20 at time 18:56\\n\\n\\nMaximum heat index 71.7°F on day 20 at time 14:32\\n\\n', '\\n\\nApr 21 Average and Extremes\\n\\n\\nAverage temperature 46.4°F\\n\\n\\nAverage humidity 59%\\n\\n\\nAverage dewpoint 30.7°F\\n\\n\\nAverage barometer 29.6 in.\\n\\n\\nAverage windspeed 3.0 mph\\n\\n\\nAverage gustspeed 4.9 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.52 in.\\n\\n\\nRainfall for year 1.60 in.\\n\\n\\nMaximum rain per minute 0.01 in. on day 21 at time 23:18\\n\\n\\nMaximum temperature 57.0°F on day 21 at time 09:23\\n\\n\\nMinimum temperature 37.8°F on day 21 at time 21:31\\n\\n\\nMaximum humidity 92% on day 21 at time 23:59\\n\\n\\nMinimum humidity 26% on day 21 at time 10:11\\n\\n\\nMaximum pressure 29.905 in. on day 21 at time 23:51\\n\\n\\nMinimum pressure 29.375 in. on day 21 at time 01:38\\n\\n\\nMaximum windspeed 15.0 mph on day 20 at time 00:04\\n\\n\\nMaximum gust speed 34.5 mph from 283 °(WNW) on day 21 at time 02:06\\n\\n\\nMaximum heat index 57.0°F on day 21 at time 09:23\\n\\n', '\\n\\nApr 22 Average and Extremes\\n\\n\\nAverage temperature 36.9°F\\n\\n\\nAverage humidity 89%\\n\\n\\nAverage dewpoint 33.9°F\\n\\n\\nAverage barometer 30.1 in.\\n\\n\\nAverage windspeed 3.3 mph\\n\\n\\nAverage gustspeed 5.2 mph\\n\\n\\nAverage direction 281° ( W )\\n\\n\\nRainfall for month 0.52 in.\\n\\n\\nRainfall for year 1.60 in.\\n\\n\\nMaximum rain per minute 0.00 in. on day 22 at time 23:59\\n\\n\\nMaximum temperature 40.2°F on day 22 at time 16:43\\n\\n\\nMinimum temperature 35.0°F on day 22 at time 07:47\\n\\n\\nMaximum humidity 93% on day 22 at time 03:02\\n\\n\\nMinimum humidity 76% on day 22 at time 16:43\\n\\n\\nMaximum pressure 30.144 in. on day 22 at time 21:14\\n\\n\\nMinimum pressure 29.834 in. on day 22 at time 01:28\\n\\n\\nMaximum windspeed 9.2 mph on day 22 at time 19:20\\n\\n\\nMaximum gust speed 19.6 mph from 281 °( W ) on day 22 at time 02:06\\n\\n\\nMaximum heat index 40.2°F on day 22 at time 16:43\\n\\n', '\\n\\nApr 23 Average and Extremes\\n\\n\\nAverage temperature 44.6°F\\n\\n\\nAverage humidity 65%\\n\\n\\nAverage dewpoint 32.3°F\\n\\n\\nAverage barometer 29.9 in.\\n\\n\\nAverage windspeed 1.9 mph\\n\\n\\nAverage gustspeed 3.6 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.52 in.\\n\\n\\nRainfall for year 1.60 in.\\n\\n\\nMaximum rain per minute 0.00 in. on day 23 at time 23:59\\n\\n\\nMaximum temperature 58.6°F on day 23 at time 18:01\\n\\n\\nMinimum temperature 29.3°F on day 23 at time 07:00\\n\\n\\nMaximum humidity 92% on day 23 at time 00:26\\n\\n\\nMinimum humidity 35% on day 23 at time 17:35\\n\\n\\nMaximum pressure 30.142 in. on day 23 at time 06:59\\n\\n\\nMinimum pressure 29.760 in. on day 23 at time 22:16\\n\\n\\nMaximum windspeed 12.7 mph on day 23 at time 15:08\\n\\n\\nMaximum gust speed 17.3 mph from 283 °(WNW) on day 23 at time 15:08\\n\\n\\nMaximum heat index 58.6°F on day 23 at time 18:01\\n\\n', '\\n\\nApr 24 Average and Extremes\\n\\n\\nAverage temperature 46.9°F\\n\\n\\nAverage humidity 56%\\n\\n\\nAverage dewpoint 29.0°F\\n\\n\\nAverage barometer 29.8 in.\\n\\n\\nAverage windspeed 2.6 mph\\n\\n\\nAverage gustspeed 4.3 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.53 in.\\n\\n\\nRainfall for year 1.61 in.\\n\\n\\nMaximum rain per minute 0.01 in. on day 24 at time 07:41\\n\\n\\nMaximum temperature 63.9°F on day 24 at time 16:03\\n\\n\\nMinimum temperature 29.5°F on day 24 at time 05:34\\n\\n\\nMaximum humidity 88% on day 24 at time 06:17\\n\\n\\nMinimum humidity 23% on day 24 at time 16:05\\n\\n\\nMaximum pressure 29.871 in. on day 24 at time 07:20\\n\\n\\nMinimum pressure 29.648 in. on day 24 at time 23:23\\n\\n\\nMaximum windspeed 18.4 mph on day 24 at time 17:43\\n\\n\\nMaximum gust speed 20.7 mph from 283 °(WNW) on day 24 at time 21:22\\n\\n\\nMaximum heat index 63.9°F on day 24 at time 16:03\\n\\n', '\\n\\nApr 25 Average and Extremes\\n\\n\\nAverage temperature 46.2°F\\n\\n\\nAverage humidity 56%\\n\\n\\nAverage dewpoint 30.0°F\\n\\n\\nAverage barometer 29.9 in.\\n\\n\\nAverage windspeed 2.5 mph\\n\\n\\nAverage gustspeed 4.5 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.54 in.\\n\\n\\nRainfall for year 1.62 in.\\n\\n\\nMaximum rain per minute 0.01 in. on day 25 at time 06:14\\n\\n\\nMaximum temperature 56.7°F on day 25 at time 13:29\\n\\n\\nMinimum temperature 34.3°F on day 25 at time 23:59\\n\\n\\nMaximum humidity 88% on day 25 at time 07:06\\n\\n\\nMinimum humidity 32% on day 25 at time 13:05\\n\\n\\nMaximum pressure 30.026 in. on day 25 at time 21:59\\n\\n\\nMinimum pressure 29.667 in. on day 25 at time 00:00\\n\\n\\nMaximum windspeed 11.5 mph on day 25 at time 12:20\\n\\n\\nMaximum gust speed 20.7 mph from 281 °( W ) on day 25 at time 04:26\\n\\n\\nMaximum heat index 56.7°F on day 25 at time 13:29\\n\\n', '\\n\\nApr 26 Average and Extremes\\n\\n\\nAverage temperature 47.5°F\\n\\n\\nAverage humidity 53%\\n\\n\\nAverage dewpoint 27.8°F\\n\\n\\nAverage barometer 29.7 in.\\n\\n\\nAverage windspeed 7.7 mph\\n\\n\\nAverage gustspeed 11.3 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.73 in.\\n\\n\\nRainfall for year 1.81 in.\\n\\n\\nMaximum rain per minute 0.02 in. on day 26 at time 22:16\\n\\n\\nMaximum temperature 67.3°F on day 26 at time 14:11\\n\\n\\nMinimum temperature 27.9°F on day 26 at time 06:04\\n\\n\\nMaximum humidity 89% on day 26 at time 23:42\\n\\n\\nMinimum humidity 18% on day 26 at time 13:38\\n\\n\\nMaximum pressure 30.004 in. on day 26 at time 00:00\\n\\n\\nMinimum pressure 29.403 in. on day 26 at time 19:52\\n\\n\\nMaximum windspeed 24.2 mph on day 26 at time 14:29\\n\\n\\nMaximum gust speed 32.2 mph from 284 °(WNW) on day 26 at time 14:28\\n\\n\\nMaximum heat index 67.3°F on day 26 at time 14:11\\n\\n', '\\n\\nApr 27 Average and Extremes\\n\\n\\nAverage temperature 49.1°F\\n\\n\\nAverage humidity 45%\\n\\n\\nAverage dewpoint 27.4°F\\n\\n\\nAverage barometer 29.6 in.\\n\\n\\nAverage windspeed 10.4 mph\\n\\n\\nAverage gustspeed 15.6 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.73 in.\\n\\n\\nRainfall for year 1.81 in.\\n\\n\\nMaximum rain per minute 0.00 in. on day 27 at time 23:59\\n\\n\\nMaximum temperature 58.1°F on day 27 at time 16:34\\n\\n\\nMinimum temperature 39.8°F on day 27 at time 23:31\\n\\n\\nMaximum humidity 78% on day 27 at time 00:01\\n\\n\\nMinimum humidity 26% on day 27 at time 13:55\\n\\n\\nMaximum pressure 29.694 in. on day 27 at time 10:16\\n\\n\\nMinimum pressure 29.400 in. on day 27 at time 23:50\\n\\n\\nMaximum windspeed 29.9 mph on day 27 at time 04:02\\n\\n\\nMaximum gust speed 48.3 mph from 281 °( W ) on day 27 at time 04:01\\n\\n\\nMaximum heat index 58.1°F on day 27 at time 16:34\\n\\n', '\\n\\nApr 28 Average and Extremes\\n\\n\\nAverage temperature 48.7°F\\n\\n\\nAverage humidity 50%\\n\\n\\nAverage dewpoint 28.9°F\\n\\n\\nAverage barometer 29.4 in.\\n\\n\\nAverage windspeed 13.6 mph\\n\\n\\nAverage gustspeed 19.9 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.81 in.\\n\\n\\nRainfall for year 1.89 in.\\n\\n\\nMaximum rain per minute 0.01 in. on day 28 at time 19:53\\n\\n\\nMaximum temperature 59.8°F on day 28 at time 12:14\\n\\n\\nMinimum temperature 35.0°F on day 28 at time 23:59\\n\\n\\nMaximum humidity 81% on day 28 at time 22:32\\n\\n\\nMinimum humidity 24% on day 28 at time 01:42\\n\\n\\nMaximum pressure 29.685 in. on day 28 at time 23:59\\n\\n\\nMinimum pressure 29.231 in. on day 28 at time 11:51\\n\\n\\nMaximum windspeed 31.1 mph on day 28 at time 12:07\\n\\n\\nMaximum gust speed 43.7 mph from 284 °(WNW) on day 28 at time 11:36\\n\\n\\nMaximum heat index 59.8°F on day 28 at time 12:14\\n\\n', '\\n\\nApr 29 Average and Extremes\\n\\n\\nAverage temperature 26.2°F\\n\\n\\nAverage humidity 85%\\n\\n\\nAverage dewpoint 22.3°F\\n\\n\\nAverage barometer 30.0 in.\\n\\n\\nAverage windspeed 2.1 mph\\n\\n\\nAverage gustspeed 3.7 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 0.82 in.\\n\\n\\nRainfall for year 1.90 in.\\n\\n\\nMaximum rain per minute 0.01 in. on day 29 at time 15:24\\n\\n\\nMaximum temperature 35.0°F on day 29 at time 00:03\\n\\n\\nMinimum temperature 21.3°F on day 29 at time 13:02\\n\\n\\nMaximum humidity 91% on day 29 at time 23:59\\n\\n\\nMinimum humidity 77% on day 29 at time 06:02\\n\\n\\nMaximum pressure 30.112 in. on day 29 at time 12:32\\n\\n\\nMinimum pressure 29.685 in. on day 29 at time 00:00\\n\\n\\nMaximum windspeed 10.4 mph on day 28 at time 00:40\\n\\n\\nMaximum gust speed 12.7 mph from 284 °(WNW) on day 29 at time 00:43\\n\\n\\nMaximum heat index 35.0°F on day 29 at time 00:03\\n\\n', '\\n\\nApr 30 Average and Extremes\\n\\n\\nAverage temperature 29.8°F\\n\\n\\nAverage humidity 94%\\n\\n\\nAverage dewpoint 28.3°F\\n\\n\\nAverage barometer 29.8 in.\\n\\n\\nAverage windspeed 2.7 mph\\n\\n\\nAverage gustspeed 4.1 mph\\n\\n\\nAverage direction 278° ( W )\\n\\n\\nRainfall for month 1.44 in.\\n\\n\\nRainfall for year 2.52 in.\\n\\n\\nMaximum rain per minute 0.02 in. on day 30 at time 10:10\\n\\n\\nMaximum temperature 37.3°F on day 30 at time 13:16\\n\\n\\nMinimum temperature 22.5°F on day 30 at time 05:56\\n\\n\\nMaximum humidity 100% on day 30 at time 23:59\\n\\n\\nMinimum humidity 88% on day 30 at time 09:22\\n\\n\\nMaximum pressure 30.076 in. on day 30 at time 00:18\\n\\n\\nMinimum pressure 29.661 in. on day 30 at time 13:05\\n\\n\\nMaximum windspeed 13.8 mph on day 30 at time 11:54\\n\\n\\nMaximum gust speed 18.4 mph from 284 °(WNW) on day 30 at time 11:57\\n\\n\\nMaximum heat index 37.3°F on day 30 at time 13:16\\n\\n', '\\n\\nAverage and Extremes for Month of April 2019 up to day 30\\n\\n\\nAverage temperature 42.1°F\\n\\n\\nAverage humidity 53%\\n\\n\\nAverage dewpoint 23.3°F\\n\\n\\nAverage barometer 29.738 in.\\n\\n\\nAverage windspeed 5.6 mph\\n\\n\\nAverage gustspeed 8.5 mph\\n\\n\\nAverage direction 282° (WNW)\\n\\n\\nRainfall for month 1.437 in.\\n\\n\\nRainfall for year 2.520 in.\\n\\n\\nMaximum rain per minute 0.020 in on day 30 at time 10:10\\n\\n\\nMaximum temperature 69.4°F on day 20 at time 14:32\\n\\n\\nMinimum temperature 12.6°F on day 12 at time 06:53\\n\\n\\nMaximum humidity 100% on day 30 at time 23:54\\n\\n\\nMinimum humidity 10% on day 20 at time 14:25\\n\\n\\nMaximum pressure 30.14 in. on day 22 at time 21:14\\n\\n\\nMinimum pressure 29.11 in. on day 10 at time 04:49\\n\\n\\nMaximum windspeed 31.1 mph from 284°(WNW) on day 28 at time 12:07\\n\\n\\nMaximum gust speed 48.3 mph from 293°(WNW) on day 27 at time 04:01\\n\\n\\nMaximum heat index 72.4°F on day 19 at time 15:36\\n\\n\\nAvg daily max temp53.9°F\\n\\n\\nAvg daily min temp30.4°F\\n\\n\\nFrost days17\\n\\n', '\\n\\nDaily Rain Totals\\n\\n\\n00.08 in. on day 2\\n\\n\\n00.02 in. on day 3\\n\\n\\n00.13 in. on day 10\\n\\n\\n00.08 in. on day 11\\n\\n\\n00.04 in. on day 12\\n\\n\\n00.01 in. on day 13\\n\\n\\n00.16 in. on day 21\\n\\n\\n00.01 in. on day 24\\n\\n\\n00.01 in. on day 25\\n\\n\\n00.19 in. on day 26\\n\\n\\n00.08 in. on day 28\\n\\n\\n00.01 in. on day 29\\n\\n\\n00.62 in. on day 30\\n\\n', '\\n\\n\\n\\n @\\n08-Feb-2023 5:50pm\\n\\n\\n\\n\\n\\t [Enable JavaScript for live updates]\\n\\n\\n\\n\\n\\t28.1\\n °F \\n\\n\\n\\n\\n\\xa0DryDusk/Dry\\t\\n\\n\\nFeels Like:\\n22°F\\n\\n\\nHumidity:\\n58%\\n\\n\\nDew Point:\\n15.2°F\\n\\n\\nWind\\n\\nSE@\\n5.2\\xa0mph\\n\\n\\nGust:\\n6.0\\xa0mph\\n\\n\\nPressure:\\n30.00 in\\n\\n\\n\\n\\n\\n\\nRain Today:\\n0.00 in\\n\\n\\nRain Rate:\\n0.000 in\\n\\n\\nStorm Rain:\\n in\\n\\n\\nRain Month:\\n0.00 in\\n\\n\\nRain Year:\\n0.28 in\\n\\n', '\\n\\nThisAfternoonChance SnowShowers andBreezyHi 31 °F \\nTonightChance SnowShowers andBlusteryLo 12 °F \\n\\n', '\\n\\nSunrise:\\n7:02 am\\n\\n\\nSunset:\\n5:28 pm\\n\\n\\nMoonrise:\\n8:31 pm\\n\\n\\nMoonset:\\n9:04 am\\n\\n\\n\\n\\n\\n\\n\\n\\n\\n\\n\\n90%\\n Illuminated\\n\\n\\n\\n\\n', '\\n\\n\\n\\n\\n\\n\\n\\n90%\\n Illuminated\\n\\n', '\\n\\nTemp Hi:\\n34.5°F \\n 2:49pm\\n\\n\\nTemp Lo:\\n9.6°F \\n 2:11am\\n\\n\\nHigh Wind Speed:\\n33.4 mph\\n 9:12am\\n\\n\\n\\n\\n\\nHigh Rain Rate:\\n0.000in/min\\n 12:00am\\n\\n\\nHigh Hourly\\n Rain Rate:\\n0.000 in/hr\\n\\n', '\\n\\nElevation:\\n0 ft\\n\\n\\nLatitude:\\n40:23:00N\\n\\n\\nLongitude:\\n105:29:00W\\n\\n', '\\n\\nQuote from the patron saint of the webmaster, St. Alphonsus Liguori : \\n\"My Jesus, Thou alone art sufficient for me.\\xa0 My love, do not permit me to separate myself from Thee.\\xa0 When shall I be able to say, \\'My God, I cannot lose thee any more?\\' \" \\n\\xa0©2007 EstesParkWeather.net and ExceptionalWeather.com. EstesParkWeather.net is part of the ExceptionalWeather Network\\nRadar/maps © Weather Underground. Used with permission. \\xa0\\xa0 Valid XHTML 1.0 \\xa0\\xa0\\xa0 Valid CSS \\n Never base important decisions on this or any weather information obtained from the Internet. \\n\\n']\n"

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"raw\_data = []\n",

"\n",

"# Find all the tables in the webpage page that we have just parsed\n",

"table = bs.find\_all(\"table\")\n",

"\n",

"for row in table:\n",

" line = row.text\n",

" raw\_data.append(line)\n",

"\n",

"print(raw\_data)"

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"### 3.2. Transform\n",

"\n",

"As we can see, the data is not in a great shape. But the good news is that we have everything in the form of a list. We can now use basic python operations that we discussed in the first and second hands-on to transform our data\n",

"\n",

"But before that, let's ask this question. In what way I could transform the data so that it could be useful for further analysis?\n",

"\n",

"Well, we wish we had the data in the following table format...\n",

"\n",

"![Screenshot%202023-02-07%20at%204.04.44%20PM.png](attachment:Screenshot%202023-02-07%20at%204.04.44%20PM.png)\n",

"\n",

"In general, a good file format to save this kind of tabular data is \*\*Comma Separated Values (CSV)\*\*\n",

"\n",

"Now let's work towards transforming our data. Our steps could be:\n",

"\n",

"- Define a list of columns and store the column names in the list\n",

"- Extract one row from raw data at a time, make a dictionary (key-value pair) out of it, where the keys are the column names and values are the entries\n",

"- Convert the data into a dataframe (which is kind of a table object) so that we could do some cleaning and apply additional transformation operations"

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"final\_data = []\n",

"\n",

"for l in raw\_data:\n",

" entries = l.split(\"\\n\")\n",

" row = {} # empty dictionary for every row\n",

" for entry in entries:\n",

" for column\_name in column\_names:\n",

" if column\_name in entry:\n",

" entry = entry.replace(column\_name,\"\")\n",

" row[column\_name] = entry\n",

" break # stops the inner loop here because we already find a match\n",

" final\_data.append(row)\n",

"\n",

"# Sanity check - let's print the first 5 rows\n",

"print(final\_data[:5])"

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"\n",

"We use \*\*Pandas\*\* to convert our data into dataframe"

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" <td>0.070 in. ( 2 mm)</td>\n",

" <td>0.010 in. ( 0 mm) on day 03 at time 18:07</td>\n",

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" <td>23.8 °F (-4.6 °C) on day 04 at time 23:57</td>\n",

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" <td>89 % on day 03 at time 08:17</td>\n",

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" <td>0.070 in. ( 2 mm)</td>\n",

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" <td>43.1 °F (6.2 °C) on day 05 at time 13:29</td>\n",

" <td>23.2 °F (-4.9 °C) on day 04 at time 00:48</td>\n",

" <td>30.3 in. on day 05 at time 23:46</td>\n",

" <td>30.6 in. on day 05 at time 09:01</td>\n",

" <td>30.0 mph from 215on day 05 at time 02:29</td>\n",

" <td>37.0 mph from 231 on day 05 at time 02:24</td>\n",

" <td>53 % on day 04 at time 00:21</td>\n",

" <td>22 % on day 05 at time 11:12</td>\n",

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" <td>11.8 °F (-11.2 °C)</td>\n",

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" <td>24.6 mph</td>\n",

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" <td>37.9 °F (3.3 °C) on day 06 at time 01:39</td>\n",

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" <td>31.0 mph from 266on day 06 at time 10:00</td>\n",

" <td>43.0 mph from 247 on day 06 at time 18:15</td>\n",

" <td>37 % on day 06 at time 01:40</td>\n",

" <td>15 % on day 06 at time 00:03</td>\n",

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" <td>58.0 mph from 267 on day 07 at time 19:31</td>\n",

" <td>49 % on day 07 at time 20:34</td>\n",

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" <td>20.9 mph</td>\n",

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" <td>0.070 in. ( 2 mm)</td>\n",

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" <td>43.0 mph from 227on day 15 at time 11:07</td>\n",

" <td>52.0 mph from 266 on day 15 at time 09:04</td>\n",

" <td>60 % on day 15 at time 16:07</td>\n",

" <td>22 % on day 15 at time 04:12</td>\n",

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" <td>7.8 mph</td>\n",

" <td>12.1 mph</td>\n",

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" <td>0.070 in. ( 2 mm)</td>\n",

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" <td>17.7 °F (-7.9 °C) on day 16 at time 20:33</td>\n",

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" <td>30.3 in. on day 16 at time 19:29</td>\n",

" <td>28.0 mph from 260on day 16 at time 23:30</td>\n",

" <td>39.0 mph from 276 on day 16 at time 23:35</td>\n",

" <td>69 % on day 16 at time 08:51</td>\n",

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" <td>15.7 mph</td>\n",

" <td>23.2 mph</td>\n",

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" <td>0.070 in. ( 2 mm)</td>\n",

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" <td>34.0 mph from 246on day 17 at time 23:35</td>\n",

" <td>46.0 mph from 261 on day 17 at time 23:36</td>\n",

" <td>58 % on day 17 at time 19:45</td>\n",

" <td>19 % on day 17 at time 01:43</td>\n",

" <td>39.8 °F (4.3 °C)on day 17 at time 13:59</td>\n",

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" <td>18.9 °F (-7.3 °C)</td>\n",

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" <td>12.9 mph</td>\n",

" <td>17.2 mph</td>\n",

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" <td>0.070 in. ( 2 mm)</td>\n",

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" <td>25.4 °F (-3.7 °C) on day 18 at time 00:06</td>\n",

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" <td>29.8 in. on day 18 at time 04:29</td>\n",

" <td>38.0 mph from 251on day 17 at time 00:56</td>\n",

" <td>47.0 mph from 241 on day 18 at time 01:03</td>\n",

" <td>91 % on day 18 at time 21:29</td>\n",

" <td>28 % on day 18 at time 11:48</td>\n",

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" <td>2.5 mph</td>\n",

" <td>3.7 mph</td>\n",

" <td>6 ° ( N )</td>\n",

" <td>0.070 in. ( 2 mm)</td>\n",

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" <td>30.2 in. on day 19 at time 23:59</td>\n",

" <td>14.0 mph from 221on day 19 at time 04:28</td>\n",

" <td>18.0 mph from 259 on day 19 at time 04:38</td>\n",

" <td>87 % on day 19 at time 00:06</td>\n",

" <td>57 % on day 19 at time 04:41</td>\n",

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" <td>30.316 in.</td>\n",

" <td>10.3 mph</td>\n",

" <td>14.0 mph</td>\n",

" <td>249 ° (WSW)</td>\n",

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" <td>0.070 in. ( 2 mm)</td>\n",

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" <td>-2.5 °F (-19.2 °C) on day 20 at time 06:20</td>\n",

" <td>30.2 in. on day 19 at time 00:14</td>\n",

" <td>30.5 in. on day 20 at time 18:44</td>\n",

" <td>26.0 mph from 288on day 20 at time 18:59</td>\n",

" <td>34.0 mph from 251 on day 20 at time 11:39</td>\n",

" <td>87 % on day 19 at time 00:19</td>\n",

" <td>33 % on day 20 at time 14:33</td>\n",

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" <td>38 %</td>\n",

" <td>0.1 °F (-17.7 °C)</td>\n",

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" <td>9.8 mph</td>\n",

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" <td>0.000 in. ( 0 mm) on day 21 at time 00:06</td>\n",

" <td>30.7 °F (-0.7 °C) on day 21 at time 13:45</td>\n",

" <td>13.6 °F (-10.2 °C) on day 21 at time 21:29</td>\n",

" <td>30.1 in. on day 21 at time 14:28</td>\n",

" <td>30.4 in. on day 21 at time 21:42</td>\n",

" <td>32.0 mph from 256on day 21 at time 02:31</td>\n",

" <td>37.0 mph from 246 on day 21 at time 09:57</td>\n",

" <td>64 % on day 21 at time 00:06</td>\n",

" <td>28 % on day 21 at time 15:16</td>\n",

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" <td>52 %</td>\n",

" <td>1.2 °F (-17.1 °C)</td>\n",

" <td>30.378 in.</td>\n",

" <td>5.5 mph</td>\n",

" <td>7.6 mph</td>\n",

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" <td>4.1 °F (-15.5 °C) on day 22 at time 07:17</td>\n",

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" <td>30.6 in. on day 22 at time 09:12</td>\n",

" <td>21.0 mph from 241on day 22 at time 23:52</td>\n",

" <td>29.0 mph from 236 on day 22 at time 00:05</td>\n",

" <td>81 % on day 22 at time 06:52</td>\n",

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" <td>2.9 °F (-16.2 °C)</td>\n",

" <td>29.142 in.</td>\n",

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" <td>24.1 °F (-4.4 °C) on day 29 at time 00:10</td>\n",

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"11 Jan 20 16.7 °F (-8.5 °C) \n",

"12 Jan 21 22.6 °F (-5.2 °C) \n",

"13 Jan 22 17.8 °F (-7.9 °C) \n",

"14 Jan 23 29.9 °F (-1.2 °C) \n",

"15 Jan 24 28.8 °F (-1.8 °C) \n",

"16 Jan 25 26.5 °F (-3.1 °C) \n",

"17 Jan 26 30.2 °F (-1.0 °C) \n",

"18 Jan 27 31.7 °F (-0.2 °C) \n",

"19 Jan 28 25.6 °F (-3.6 °C) \n",

"20 Jan 29 25.4 °F (-3.7 °C) \n",

"21 Jan 30 34.7 °F (1.5 °C) \n",

"22 Jan 31 37.7 °F (3.2 °C) \n",

"23 for Month of January 2006 up to day 31 31.1 °F (-0.5 °C) \n",

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"25 NaN NaN \n",

"26 NaN NaN \n",

"27 NaN NaN \n",

"28 NaN NaN \n",

"29 NaN NaN \n",

"30 NaN NaN \n",

"31 NaN NaN \n",

"\n",

" Average humidity Average dewpoint Average barometer Average windspeed \\\n",

"0 44 % 15.9 °F (-8.9 °C) 29.491 in. 13.2 mph \n",

"1 35 % 14.1 °F (-10.0 °C) 29.800 in. 16.0 mph \n",

"2 48 % 15.3 °F (-9.3 °C) 30.039 in. 12.7 mph \n",

"3 31 % 6.2 °F (-14.3 °C) 30.520 in. 15.5 mph \n",

"4 24 % 11.8 °F (-11.2 °C) 30.102 in. 17.3 mph \n",

"5 21 % 7.6 °F (-13.5 °C) 29.657 in. 16.7 mph \n",

"6 32 % 8.1 °F (-13.3 °C) 29.535 in. 14.9 mph \n",

"7 41 % 0.2 °F (-17.7 °C) 30.037 in. 7.8 mph \n",

"8 35 % 5.2 °F (-14.9 °C) 30.012 in. 15.7 mph \n",

"9 59 % 18.9 °F (-7.3 °C) 29.760 in. 12.9 mph \n",

"10 80 % 15.7 °F (-9.1 °C) 29.959 in. 2.5 mph \n",

"11 54 % 1.4 °F (-17.0 °C) 30.316 in. 10.3 mph \n",

"12 38 % 0.1 °F (-17.7 °C) 30.248 in. 9.8 mph \n",

"13 52 % 1.2 °F (-17.1 °C) 30.378 in. 5.5 mph \n",

"14 31 % 2.9 °F (-16.2 °C) 29.142 in. 15.2 mph \n",

"15 43 % 6.8 °F (-14.0 °C) 29.391 in. 1.2 mph \n",

"16 49 % 6.1 °F (-14.4 °C) 29.296 in. 1.3 mph \n",

"17 49 % 12.6 °F (-10.8 °C) 28.855 in. 12.1 mph \n",

"18 38 % 7.9 °F (-13.4 °C) 28.889 in. 8.7 mph \n",

"19 38 % 2.8 °F (-16.2 °C) 28.845 in. 14.8 mph \n",

"20 40 % 3.7 °F (-15.7 °C) 28.853 in. 16.1 mph \n",

"21 44 % 14.9 °F (-9.5 °C) 28.862 in. 16.0 mph \n",

"22 41 % 15.3 °F (-9.3 °C) 28.611 in. 12.7 mph \n",

"23 42 % 8.7 °F (-12.9 °C) 29.591 in. 11.8 mph \n",

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"25 NaN NaN NaN NaN \n",

"26 NaN NaN NaN NaN \n",

"27 NaN NaN NaN NaN \n",

"28 NaN NaN NaN NaN \n",

"29 NaN NaN NaN NaN \n",

"30 NaN NaN NaN NaN \n",

"31 NaN NaN NaN NaN \n",

"\n",

" Average gustspeed Average direction Rainfall for month \\\n",

"0 18.1 mph 250 ° (WSW) 0.000 in. ( 0 mm) \n",

"1 21.5 mph 251 ° (WSW) 0.000 in. ( 0 mm) \n",

"2 17.3 mph 252 ° (WSW) 0.070 in. ( 2 mm) \n",

"3 19.3 mph 228 ° ( SW) 0.070 in. ( 2 mm) \n",

"4 24.6 mph 254 ° (WSW) 0.070 in. ( 2 mm) \n",

"5 22.8 mph 248 ° (WSW) 0.070 in. ( 2 mm) \n",

"6 20.9 mph 247 ° (WSW) 0.070 in. ( 2 mm) \n",

"7 12.1 mph 267 ° ( W ) 0.070 in. ( 2 mm) \n",

"8 23.2 mph 252 ° (WSW) 0.070 in. ( 2 mm) \n",

"9 17.2 mph 247 ° (WSW) 0.070 in. ( 2 mm) \n",

"10 3.7 mph 6 ° ( N ) 0.070 in. ( 2 mm) \n",

"11 14.0 mph 249 ° (WSW) 0.070 in. ( 2 mm) \n",

"12 13.6 mph 248 ° (WSW) 0.070 in. ( 2 mm) \n",

"13 7.6 mph 244 ° (WSW) 0.070 in. ( 2 mm) \n",

"14 19.9 mph 247 ° (WSW) 0.070 in. ( 2 mm) \n",

"15 2.3 mph 309 ° ( NW) 0.070 in. ( 2 mm) \n",

"16 2.1 mph 339 ° (NNW) 0.070 in. ( 2 mm) \n",

"17 17.0 mph 253 ° (WSW) 0.070 in. ( 2 mm) \n",

"18 12.1 mph 253 ° (WSW) 0.070 in. ( 2 mm) \n",

"19 20.0 mph 248 ° (WSW) 0.070 in. ( 2 mm) \n",

"20 23.0 mph 254 ° (WSW) 0.070 in. ( 2 mm) \n",

"21 21.1 mph 241 ° (WSW) 0.070 in. ( 2 mm) \n",

"22 18.0 mph 254 ° (WSW) 0.000 in. ( 0 mm) \n",

"23 16.3 mph 250 ° (WSW) 0.070 in. ( 2 mm) \n",

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"25 NaN NaN NaN \n",

"26 NaN NaN NaN \n",

"27 NaN NaN NaN \n",

"28 NaN NaN NaN \n",

"29 NaN NaN NaN \n",

"30 NaN NaN NaN \n",

"31 NaN NaN NaN \n",

"\n",

" Rainfall for year Maximum rain per minute \\\n",

"0 0.000 in. ( 0 mm) 0.000 in. ( 0 mm) on day 01 at time 00:06 \n",

"1 0.000 in. ( 0 mm) 0.000 in. ( 0 mm) on day 02 at time 00:06 \n",

"2 0.070 in. ( 2 mm) 0.010 in. ( 0 mm) on day 03 at time 18:07 \n",

"3 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 05 at time 00:06 \n",

"4 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 06 at time 00:06 \n",

"5 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 14 at time 00:06 \n",

"6 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 15 at time 00:06 \n",

"7 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 16 at time 00:06 \n",

"8 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 17 at time 00:06 \n",

"9 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 18 at time 00:06 \n",

"10 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 19 at time 00:06 \n",

"11 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 20 at time 00:06 \n",

"12 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 21 at time 00:06 \n",

"13 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 22 at time 00:06 \n",

"14 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 23 at time 00:06 \n",

"15 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 24 at time 00:06 \n",

"16 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 25 at time 00:06 \n",

"17 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 26 at time 00:06 \n",

"18 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 27 at time 00:06 \n",

"19 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 28 at time 00:06 \n",

"20 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 29 at time 00:06 \n",

"21 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 30 at time 00:06 \n",

"22 0.070 in. ( 2 mm) 0.000 in. ( 0 mm) on day 00 at time 00:06 \n",

"23 0.070 in. ( 2 mm) 0.010 in. ( 0 mm) on day 03 at time 18:07 \n",

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"27 NaN NaN \n",

"28 NaN NaN \n",

"29 NaN NaN \n",

"30 NaN NaN \n",

"31 NaN NaN \n",

"\n",

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"0 41.5 °F (5.3 °C) on day 01 at time 00:09 \n",

"1 47.0 °F (8.3 °C) on day 02 at time 14:29 \n",

"2 43.3 °F (6.3 °C) on day 03 at time 03:22 \n",

"3 43.1 °F (6.2 °C) on day 05 at time 13:29 \n",

"4 54.5 °F (12.5 °C) on day 06 at time 13:24 \n",

"5 55.1 °F (12.8 °C) on day 14 at time 14:57 \n",

"6 42.5 °F (5.8 °C) on day 15 at time 12:19 \n",

"7 29.7 °F (-1.3 °C) on day 16 at time 11:50 \n",

"8 39.8 °F (4.3 °C) on day 17 at time 13:59 \n",

"9 42.6 °F (5.9 °C) on day 18 at time 11:11 \n",

"10 26.1 °F (-3.3 °C) on day 19 at time 04:42 \n",

"11 24.5 °F (-4.2 °C) on day 20 at time 14:54 \n",

"12 30.7 °F (-0.7 °C) on day 21 at time 13:45 \n",

"13 30.0 °F (-1.1 °C) on day 22 at time 14:30 \n",

"14 39.5 °F (4.2 °C) on day 23 at time 15:44 \n",

"15 50.8 °F (10.4 °C) on day 24 at time 13:15 \n",

"16 53.3 °F (11.8 °C) on day 25 at time 14:58 \n",

"17 37.6 °F (3.1 °C) on day 26 at time 12:08 \n",

"18 41.3 °F (5.2 °C) on day 27 at time 14:29 \n",

"19 33.2 °F (0.7 °C) on day 28 at time 14:33 \n",

"20 29.4 °F (-1.4 °C) on day 29 at time 12:26 \n",

"21 46.0 °F (7.8 °C) on day 30 at time 13:29 \n",

"22 44.3 °F (6.8 °C) on day 31 at time 12:27 \n",

"23 55.1 °F (12.8 °C) on day 14 at time 14:57 \n",

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"25 NaN \n",

"26 NaN \n",

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"29 NaN \n",

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"31 NaN \n",

"\n",

" Minimum temperature \\\n",

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"1 31.3 °F (-0.4 °C) on day 01 at time 00:09 \n",

"2 23.8 °F (-4.6 °C) on day 04 at time 23:57 \n",

"3 23.2 °F (-4.9 °C) on day 04 at time 00:48 \n",

"4 37.9 °F (3.3 °C) on day 06 at time 01:39 \n",

"5 23.4 °F (-4.8 °C) on day 12 at time 18:34 \n",

"6 25.0 °F (-3.9 °C) on day 15 at time 00:06 \n",

"7 17.7 °F (-7.9 °C) on day 16 at time 20:33 \n",

"8 20.0 °F (-6.7 °C) on day 16 at time 00:50 \n",

"9 25.4 °F (-3.7 °C) on day 18 at time 00:06 \n",

"10 13.6 °F (-10.2 °C) on day 19 at time 23:09 \n",

"11 -2.5 °F (-19.2 °C) on day 20 at time 06:20 \n",

"12 13.6 °F (-10.2 °C) on day 21 at time 21:29 \n",

"13 4.1 °F (-15.5 °C) on day 22 at time 07:17 \n",

"14 21.9 °F (-5.6 °C) on day 23 at time 01:57 \n",

"15 12.6 °F (-10.8 °C) on day 24 at time 07:47 \n",

"16 7.2 °F (-13.8 °C) on day 25 at time 07:09 \n",

"17 16.4 °F (-8.7 °C) on day 26 at time 02:57 \n",

"18 25.9 °F (-3.4 °C) on day 27 at time 23:33 \n",

"19 20.0 °F (-6.7 °C) on day 28 at time 07:29 \n",

"20 22.9 °F (-5.1 °C) on day 29 at time 07:26 \n",

"21 24.1 °F (-4.4 °C) on day 29 at time 00:10 \n",

"22 29.7 °F (-1.3 °C) on day 31 at time 22:25 \n",

"23 -2.5 °F (-19.2 °C) on day 20 at time 06:20 \n",

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"29 NaN \n",

"30 NaN \n",

"31 NaN \n",

"\n",

" Minimum pressure Maximum pressure \\\n",

"0 29.2 in. on day 01 at time 06:29 29.8 in. on day 01 at time 23:16 \n",

"1 29.7 in. on day 02 at time 13:01 29.8 in. on day 02 at time 18:31 \n",

"2 29.6 in. on day 03 at time 04:16 30.5 in. on day 04 at time 23:16 \n",

"3 30.3 in. on day 05 at time 23:46 30.6 in. on day 05 at time 09:01 \n",

"4 29.8 in. on day 06 at time 23:46 30.3 in. on day 05 at time 00:16 \n",

"5 29.4 in. on day 07 at time 19:01 30.1 in. on day 12 at time 18:14 \n",

"6 29.4 in. on day 15 at time 12:59 29.7 in. on day 15 at time 00:06 \n",

"7 29.7 in. on day 15 at time 00:44 30.3 in. on day 16 at time 19:29 \n",

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"9 29.7 in. on day 18 at time 20:59 29.8 in. on day 18 at time 04:29 \n",

"10 29.7 in. on day 19 at time 04:59 30.2 in. on day 19 at time 23:59 \n",

"11 30.2 in. on day 19 at time 00:14 30.5 in. on day 20 at time 18:44 \n",

"12 30.1 in. on day 21 at time 14:28 30.4 in. on day 21 at time 21:42 \n",

"13 29.1 in. on day 22 at time 00:06 30.6 in. on day 22 at time 09:12 \n",

"14 29.0 in. on day 23 at time 15:06 29.2 in. on day 23 at time 18:51 \n",

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"16 28.9 in. on day 25 at time 23:51 29.6 in. on day 25 at time 07:21 \n",

"17 28.7 in. on day 26 at time 05:06 28.9 in. on day 26 at time 21:51 \n",

"18 28.7 in. on day 27 at time 14:51 29.0 in. on day 27 at time 06:21 \n",

"19 28.7 in. on day 28 at time 21:51 29.0 in. on day 28 at time 07:21 \n",

"20 28.7 in. on day 29 at time 01:21 29.0 in. on day 29 at time 23:36 \n",

"21 28.6 in. on day 30 at time 00:06 29.0 in. on day 30 at time 04:36 \n",

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"0 34.0 mph from 254on day 01 at time 23:32 \n",

"1 43.0 mph from 256on day 02 at time 11:48 \n",

"2 39.0 mph from 259on day 03 at time 17:58 \n",

"3 30.0 mph from 215on day 05 at time 02:29 \n",

"4 31.0 mph from 266on day 06 at time 10:00 \n",

"5 40.0 mph from 256on day 07 at time 18:42 \n",

"6 43.0 mph from 227on day 15 at time 11:07 \n",

"7 28.0 mph from 260on day 16 at time 23:30 \n",

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"21 36.0 mph from 240on day 30 at time 04:54 \n",

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"30 NaN \n",

"31 NaN \n",

"\n",

" Maximum gust speed Maximum humidity \\\n",

"0 45.0 mph from 254 on day 01 at time 23:32 62 % on day 01 at time 05:47 \n",

"1 56.0 mph from 256 on day 02 at time 11:48 51 % on day 02 at time 00:06 \n",

"2 62.0 mph from 254 on day 03 at time 17:56 89 % on day 03 at time 08:17 \n",

"3 37.0 mph from 231 on day 05 at time 02:24 53 % on day 04 at time 00:21 \n",

"4 43.0 mph from 247 on day 06 at time 18:15 37 % on day 06 at time 01:40 \n",

"5 58.0 mph from 267 on day 07 at time 19:31 49 % on day 07 at time 20:34 \n",

"6 52.0 mph from 266 on day 15 at time 09:04 60 % on day 15 at time 16:07 \n",

"7 39.0 mph from 276 on day 16 at time 23:35 69 % on day 16 at time 08:51 \n",

"8 46.0 mph from 261 on day 17 at time 23:36 58 % on day 17 at time 19:45 \n",

"9 47.0 mph from 241 on day 18 at time 01:03 91 % on day 18 at time 21:29 \n",

"10 18.0 mph from 259 on day 19 at time 04:38 87 % on day 19 at time 00:06 \n",

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"12 37.0 mph from 246 on day 21 at time 09:57 64 % on day 21 at time 00:06 \n",

"13 29.0 mph from 236 on day 22 at time 00:05 81 % on day 22 at time 06:52 \n",

"14 41.0 mph from 244 on day 22 at time 00:52 42 % on day 23 at time 07:54 \n",

"15 16.0 mph from 288 on day 23 at time 00:28 67 % on day 24 at time 23:54 \n",

"16 12.0 mph from 041 on day 25 at time 15:01 73 % on day 25 at time 08:16 \n",

"17 43.0 mph from 250 on day 26 at time 15:55 71 % on day 26 at time 03:36 \n",

"18 34.0 mph from 244 on day 27 at time 01:47 65 % on day 27 at time 23:20 \n",

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"22 43.0 mph from 240 on day 31 at time 01:19 67 % on day 31 at time 07:54 \n",

"23 62.0 mph from 254 on day 03 at time 17:56 91 % on day 18 at time 21:29 \n",

"24 NaN NaN \n",

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"29 NaN NaN \n",

"30 NaN NaN \n",

"31 NaN NaN \n",

"\n",

" Minimum humidity Maximum heat index \n",

"0 31 % on day 01 at time 21:46 41.5 °F (5.3 °C)on day 00 at time 00:09 \n",

"1 22 % on day 02 at time 06:51 47.0 °F (8.3 °C)on day 02 at time 14:29 \n",

"2 33 % on day 03 at time 03:12 43.3 °F (6.3 °C)on day 03 at time 03:22 \n",

"3 22 % on day 05 at time 11:12 43.1 °F (6.2 °C)on day 05 at time 13:29 \n",

"4 15 % on day 06 at time 00:03 54.5 °F (12.5 °C)on day 06 at time 13:24 \n",

"5 14 % on day 14 at time 14:59 55.1 °F (12.8 °C)on day 14 at time 14:57 \n",

"6 22 % on day 15 at time 04:12 42.5 °F (5.8 °C)on day 15 at time 12:19 \n",

"7 22 % on day 16 at time 00:06 29.7 °F (-1.3 °C)on day 16 at time 11:50 \n",

"8 19 % on day 17 at time 01:43 39.8 °F (4.3 °C)on day 17 at time 13:59 \n",

"9 28 % on day 18 at time 11:48 42.6 °F (5.9 °C)on day 18 at time 11:11 \n",

"10 57 % on day 19 at time 04:41 26.1 °F (-3.3 °C)on day 19 at time 04:42 \n",

"11 33 % on day 20 at time 14:33 24.5 °F (-4.2 °C)on day 20 at time 14:54 \n",

"12 28 % on day 21 at time 15:16 30.7 °F (-0.7 °C)on day 21 at time 13:45 \n",

"13 22 % on day 22 at time 00:04 30.0 °F (-1.1 °C)on day 22 at time 14:30 \n",

"14 21 % on day 23 at time 03:45 39.5 °F (4.2 °C)on day 23 at time 15:44 \n",

"15 15 % on day 24 at time 12:43 50.8 °F (10.4 °C)on day 24 at time 13:15 \n",

"16 12 % on day 25 at time 14:44 53.3 °F (11.8 °C)on day 25 at time 14:58 \n",

"17 31 % on day 26 at time 12:21 37.6 °F (3.1 °C)on day 26 at time 12:08 \n",

"18 17 % on day 27 at time 14:37 41.3 °F (5.2 °C)on day 27 at time 14:29 \n",

"19 20 % on day 28 at time 13:39 33.2 °F (0.7 °C)on day 28 at time 14:33 \n",

"20 27 % on day 29 at time 14:14 29.4 °F (-1.4 °C)on day 29 at time 12:26 \n",

"21 29 % on day 30 at time 13:30 46.0 °F (7.8 °C)on day 30 at time 13:29 \n",

"22 26 % on day 31 at time 16:46 44.3 °F (6.8 °C)on day 31 at time 12:27 \n",

"23 12 % on day 25 at time 14:44 55.1 °F (12.8 °C)on day 14 at time 14:57 \n",

"24 NaN NaN \n",

"25 NaN NaN \n",

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"final\_data = pandas.DataFrame(final\_data)\n",

"\n",

"# Print a few elements in the dataframe\n",

"final\_data"

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"At this point we have transformed our data into a decent form. We can choose to store it or do a bit more cleaning and then store.\n",

"\n",

"Some basic cleaning that we can do:\n",

"\n",

"- Does the data contain any duplicate rows? If yes, remove them.\n",

"- Does the data contain any NULL entries? If yes, then replace the entry with a default value (we can even remove the row completely).\n",

"\n",

"And some basic statistical analysis before storing the data\n"

]

},

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"#### Duplication Checks and Cleaning"

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"metadata": {},

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" Number of duplicates before : 7\n",

" Number of duplicates after removing : 0\n"

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"number\_of\_duplicates = final\_data.duplicated().sum()\n",

"print (f\" Number of duplicates before : {number\_of\_duplicates}\")\n",

"\n",

"# Delete duplicate rows\n",

"final\_data = final\_data.drop\_duplicates()\n",

"\n",

"number\_of\_duplicates = final\_data.duplicated().sum()\n",

"print (f\" Number of duplicates after removing : {number\_of\_duplicates}\")"

]

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"#### Inspecting data and checking noisy entries"

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},

"outputs": [

{

"name": "stdout",

"output\_type": "stream",

"text": [

"<class 'pandas.core.frame.DataFrame'>\n",

"Int64Index: 33 entries, 0 to 32\n",

"Data columns (total 20 columns):\n",

" # Column Non-Null Count Dtype \n",

"--- ------ -------------- ----- \n",

" 0 Average and Extremes 32 non-null object\n",

" 1 Average temperature 32 non-null object\n",

" 2 Average humidity 32 non-null object\n",

" 3 Average dewpoint 32 non-null object\n",

" 4 Average barometer 32 non-null object\n",

" 5 Average windspeed 32 non-null object\n",

" 6 Average gustspeed 32 non-null object\n",

" 7 Average direction 32 non-null object\n",

" 8 Rainfall for month 32 non-null object\n",

" 9 Rainfall for year 32 non-null object\n",

" 10 Maximum rain per minute 32 non-null object\n",

" 11 Maximum temperature 32 non-null object\n",

" 12 Minimum temperature 32 non-null object\n",

" 13 Maximum humidity 32 non-null object\n",

" 14 Minimum humidity 32 non-null object\n",

" 15 Maximum pressure 32 non-null object\n",

" 16 Minimum pressure 32 non-null object\n",

" 17 Maximum windspeed 32 non-null object\n",

" 18 Maximum gust speed 32 non-null object\n",

" 19 Maximum heat index 32 non-null object\n",

"dtypes: object(20)\n",

"memory usage: 5.4+ KB\n"

]

}

],

"source": [

"final\_data.info()"

]

},

{

"cell\_type": "markdown",

"id": "cf3d0e41",

"metadata": {},

"source": [

"We can see that the data has 33 rows overall and but 32 non-null entries. Let's delete the row with NULL entries"

]

},

{

"cell\_type": "code",

"execution\_count": 184,

"id": "dc26b887",

"metadata": {

"scrolled": true

},

"outputs": [

{

"name": "stdout",

"output\_type": "stream",

"text": [

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"Int64Index: 32 entries, 0 to 31\n",

"Data columns (total 20 columns):\n",

" # Column Non-Null Count Dtype \n",

"--- ------ -------------- ----- \n",

" 0 Average and Extremes 32 non-null object\n",

" 1 Average temperature 32 non-null object\n",

" 2 Average humidity 32 non-null object\n",

" 3 Average dewpoint 32 non-null object\n",

" 4 Average barometer 32 non-null object\n",

" 5 Average windspeed 32 non-null object\n",

" 6 Average gustspeed 32 non-null object\n",

" 7 Average direction 32 non-null object\n",

" 8 Rainfall for month 32 non-null object\n",

" 9 Rainfall for year 32 non-null object\n",

" 10 Maximum rain per minute 32 non-null object\n",

" 11 Maximum temperature 32 non-null object\n",

" 12 Minimum temperature 32 non-null object\n",

" 13 Maximum humidity 32 non-null object\n",

" 14 Minimum humidity 32 non-null object\n",

" 15 Maximum pressure 32 non-null object\n",

" 16 Minimum pressure 32 non-null object\n",

" 17 Maximum windspeed 32 non-null object\n",

" 18 Maximum gust speed 32 non-null object\n",

" 19 Maximum heat index 32 non-null object\n",

"dtypes: object(20)\n",

"memory usage: 5.2+ KB\n"

]

}

],

"source": [

"final\_data = final\_data.dropna()\n",

"final\_data.info()"

]

},

{

"cell\_type": "markdown",

"id": "905d4df9",

"metadata": {},

"source": [

"\*\*[Additional Transformations]\*\* We can remove unnecessary strings (e.g. \"F\" for fahrenheit) and \"%\" Symbol and convert these columns into integer/float\n"

]

},

{

"cell\_type": "code",

"execution\_count": 123,

"id": "8fccf1fc",

"metadata": {

"scrolled": false

},

"outputs": [

{

"ename": "AttributeError",

"evalue": "'float' object has no attribute 'replace'",

"output\_type": "error",

"traceback": [

"\u001b[1;31m---------------------------------------------------------------------------\u001b[0m",

"\u001b[1;31mAttributeError\u001b[0m Traceback (most recent call last)",

"\u001b[1;32m~\\AppData\\Local\\Temp\\ipykernel\_11944\\769641127.py\u001b[0m in \u001b[0;36m<module>\u001b[1;34m\u001b[0m\n\u001b[0;32m 9\u001b[0m \u001b[1;32mreturn\u001b[0m \u001b[0mconverted\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n\u001b[0;32m 10\u001b[0m \u001b[1;33m\u001b[0m\u001b[0m\n\u001b[1;32m---> 11\u001b[1;33m \u001b[0mfinal\_data\u001b[0m\u001b[1;33m[\u001b[0m\u001b[1;34m\"Average temperature\"\u001b[0m\u001b[1;33m]\u001b[0m \u001b[1;33m=\u001b[0m \u001b[0mfinal\_data\u001b[0m\u001b[1;33m[\u001b[0m\u001b[1;34m\"Average temperature\"\u001b[0m\u001b[1;33m]\u001b[0m\u001b[1;33m.\u001b[0m\u001b[0mapply\u001b[0m\u001b[1;33m(\u001b[0m\u001b[0mclearn\_string\_and\_convert\u001b[0m\u001b[1;33m)\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n\u001b[0m\u001b[0;32m 12\u001b[0m \u001b[0mfinal\_data\u001b[0m\u001b[1;33m[\u001b[0m\u001b[1;34m\"Average humidity\"\u001b[0m\u001b[1;33m]\u001b[0m \u001b[1;33m=\u001b[0m \u001b[0mfinal\_data\u001b[0m\u001b[1;33m[\u001b[0m\u001b[1;34m\"Average humidity\"\u001b[0m\u001b[1;33m]\u001b[0m\u001b[1;33m.\u001b[0m\u001b[0mapply\u001b[0m\u001b[1;33m(\u001b[0m\u001b[0mclearn\_string\_and\_convert\u001b[0m\u001b[1;33m)\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n\u001b[0;32m 13\u001b[0m \u001b[0mfinal\_data\u001b[0m\u001b[1;33m[\u001b[0m\u001b[1;34m\"Average dewpoint\"\u001b[0m\u001b[1;33m]\u001b[0m \u001b[1;33m=\u001b[0m \u001b[0mfinal\_data\u001b[0m\u001b[1;33m[\u001b[0m\u001b[1;34m\"Average dewpoint\"\u001b[0m\u001b[1;33m]\u001b[0m\u001b[1;33m.\u001b[0m\u001b[0mapply\u001b[0m\u001b[1;33m(\u001b[0m\u001b[0mclearn\_string\_and\_convert\u001b[0m\u001b[1;33m)\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n",

"\u001b[1;32m~\\anaconda3\\lib\\site-packages\\pandas\\core\\series.py\u001b[0m in \u001b[0;36mapply\u001b[1;34m(self, func, convert\_dtype, args, \*\*kwargs)\u001b[0m\n\u001b[0;32m 4431\u001b[0m \u001b[0mdtype\u001b[0m\u001b[1;33m:\u001b[0m \u001b[0mfloat64\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n\u001b[0;32m 4432\u001b[0m \"\"\"\n\u001b[1;32m-> 4433\u001b[1;33m \u001b[1;32mreturn\u001b[0m \u001b[0mSeriesApply\u001b[0m\u001b[1;33m(\u001b[0m\u001b[0mself\u001b[0m\u001b[1;33m,\u001b[0m \u001b[0mfunc\u001b[0m\u001b[1;33m,\u001b[0m \u001b[0mconvert\_dtype\u001b[0m\u001b[1;33m,\u001b[0m \u001b[0margs\u001b[0m\u001b[1;33m,\u001b[0m \u001b[0mkwargs\u001b[0m\u001b[1;33m)\u001b[0m\u001b[1;33m.\u001b[0m\u001b[0mapply\u001b[0m\u001b[1;33m(\u001b[0m\u001b[1;33m)\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n\u001b[0m\u001b[0;32m 4434\u001b[0m \u001b[1;33m\u001b[0m\u001b[0m\n\u001b[0;32m 4435\u001b[0m def \_reduce(\n",

"\u001b[1;32m~\\anaconda3\\lib\\site-packages\\pandas\\core\\apply.py\u001b[0m in \u001b[0;36mapply\u001b[1;34m(self)\u001b[0m\n\u001b[0;32m 1086\u001b[0m \u001b[1;32mreturn\u001b[0m \u001b[0mself\u001b[0m\u001b[1;33m.\u001b[0m\u001b[0mapply\_str\u001b[0m\u001b[1;33m(\u001b[0m\u001b[1;33m)\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n\u001b[0;32m 1087\u001b[0m \u001b[1;33m\u001b[0m\u001b[0m\n\u001b[1;32m-> 1088\u001b[1;33m \u001b[1;32mreturn\u001b[0m \u001b[0mself\u001b[0m\u001b[1;33m.\u001b[0m\u001b[0mapply\_standard\u001b[0m\u001b[1;33m(\u001b[0m\u001b[1;33m)\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n\u001b[0m\u001b[0;32m 1089\u001b[0m \u001b[1;33m\u001b[0m\u001b[0m\n\u001b[0;32m 1090\u001b[0m \u001b[1;32mdef\u001b[0m \u001b[0magg\u001b[0m\u001b[1;33m(\u001b[0m\u001b[0mself\u001b[0m\u001b[1;33m)\u001b[0m\u001b[1;33m:\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n",

"\u001b[1;32m~\\anaconda3\\lib\\site-packages\\pandas\\core\\apply.py\u001b[0m in \u001b[0;36mapply\_standard\u001b[1;34m(self)\u001b[0m\n\u001b[0;32m 1141\u001b[0m \u001b[1;31m# List[Union[Callable[..., Any], str]]]]]\"; expected\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n\u001b[0;32m 1142\u001b[0m \u001b[1;31m# \"Callable[[Any], Any]\"\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n\u001b[1;32m-> 1143\u001b[1;33m mapped = lib.map\_infer(\n\u001b[0m\u001b[0;32m 1144\u001b[0m \u001b[0mvalues\u001b[0m\u001b[1;33m,\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n\u001b[0;32m 1145\u001b[0m \u001b[0mf\u001b[0m\u001b[1;33m,\u001b[0m \u001b[1;31m# type: ignore[arg-type]\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n",

"\u001b[1;32m~\\anaconda3\\lib\\site-packages\\pandas\\\_libs\\lib.pyx\u001b[0m in \u001b[0;36mpandas.\_libs.lib.map\_infer\u001b[1;34m()\u001b[0m\n",

"\u001b[1;32m~\\AppData\\Local\\Temp\\ipykernel\_11944\\769641127.py\u001b[0m in \u001b[0;36mclearn\_string\_and\_convert\u001b[1;34m(s)\u001b[0m\n\u001b[0;32m 1\u001b[0m \u001b[1;31m# Define a function for cleaning\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n\u001b[0;32m 2\u001b[0m \u001b[1;32mdef\u001b[0m \u001b[0mclearn\_string\_and\_convert\u001b[0m\u001b[1;33m(\u001b[0m\u001b[0ms\u001b[0m\u001b[1;33m)\u001b[0m\u001b[1;33m:\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n\u001b[1;32m----> 3\u001b[1;33m \u001b[0ms\u001b[0m \u001b[1;33m=\u001b[0m \u001b[0ms\u001b[0m\u001b[1;33m.\u001b[0m\u001b[0mreplace\u001b[0m\u001b[1;33m(\u001b[0m\u001b[1;34m\"%\"\u001b[0m\u001b[1;33m,\u001b[0m\u001b[1;34m\"\"\u001b[0m\u001b[1;33m)\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n\u001b[0m\u001b[0;32m 4\u001b[0m \u001b[0ms\u001b[0m \u001b[1;33m=\u001b[0m \u001b[0ms\u001b[0m\u001b[1;33m.\u001b[0m\u001b[0mreplace\u001b[0m\u001b[1;33m(\u001b[0m\u001b[1;34m\"°F\"\u001b[0m\u001b[1;33m,\u001b[0m\u001b[1;34m\"\"\u001b[0m\u001b[1;33m)\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n\u001b[0;32m 5\u001b[0m \u001b[0ms\u001b[0m \u001b[1;33m=\u001b[0m \u001b[0ms\u001b[0m\u001b[1;33m.\u001b[0m\u001b[0mreplace\u001b[0m\u001b[1;33m(\u001b[0m\u001b[1;34m\"in.\"\u001b[0m\u001b[1;33m,\u001b[0m\u001b[1;34m\"\"\u001b[0m\u001b[1;33m)\u001b[0m\u001b[1;33m\u001b[0m\u001b[1;33m\u001b[0m\u001b[0m\n",

"\u001b[1;31mAttributeError\u001b[0m: 'float' object has no attribute 'replace'"

]

}

],

"source": [

"# Define a function for cleaning\n",

"def clearn\_string\_and\_convert(s):\n",

" s = s.replace(\"%\",\"\")\n",

" s = s.replace(\"°F\",\"\")\n",

" s = s.replace(\"in.\",\"\")\n",

" s = s.replace(\"mph\",\"\")\n",

" s = s.split(\"(\")[0]\n",

" converted = float(s)\n",

" return converted\n",

"\n",

"final\_data[\"Average temperature\"] = final\_data[\"Average temperature\"].apply(clearn\_string\_and\_convert)\n",

"final\_data[\"Average humidity\"] = final\_data[\"Average humidity\"].apply(clearn\_string\_and\_convert)\n",

"final\_data[\"Average dewpoint\"] = final\_data[\"Average dewpoint\"].apply(clearn\_string\_and\_convert)\n",

"final\_data[\"Average barometer\"] = final\_data[\"Average barometer\"].apply(clearn\_string\_and\_convert)\n",

"final\_data[\"Average windspeed\"] = final\_data[\"Average windspeed\"].apply(clearn\_string\_and\_convert)\n",

"final\_data[\"Average gustspeed\"] = final\_data[\"Average gustspeed\"].apply(clearn\_string\_and\_convert)\n",

"\n",

"final\_data.head()"

]

},

{

"cell\_type": "markdown",

"id": "4e20814f",

"metadata": {},

"source": [

"\*\*[Optional]\*\* Describe some of your columns"

]

},

{

"cell\_type": "code",

"execution\_count": 186,

"id": "8e810cc0",

"metadata": {

"scrolled": false

},

"outputs": [

{

"data": {

"text/plain": [

"count 32.000000\n",

"mean 24.900000\n",

"std 10.212927\n",

"min -0.800000\n",

"25% 20.350000\n",

"50% 23.000000\n",

"75% 32.350000\n",

"max 42.900000\n",

"Name: Average temperature, dtype: float64"

]

},

"execution\_count": 186,

"metadata": {},

"output\_type": "execute\_result"

}

],

"source": [

"final\_data[\"Average temperature\"].describe()"

]

},

{

"cell\_type": "markdown",

"id": "609bd506",

"metadata": {},

"source": [

"\*\*[Optional]\*\* Plot a histogram of a column"

]

},

{

"cell\_type": "code",

"execution\_count": 111,

"id": "e6bad12f",

"metadata": {},

"outputs": [

{

"data": {

"image/png": "\n",

"text/plain": [

"<Figure size 640x480 with 1 Axes>"

]

},

"metadata": {},

"output\_type": "display\_data"

}

],

"source": [

"hist = final\_data[\"Average temperature\"].hist(bins=5)"

]

},

{

"cell\_type": "markdown",

"id": "e8ea84e9",

"metadata": {},

"source": [

"We will look into visualizations in the next hands-on"

]

},

{

"cell\_type": "markdown",

"id": "8aa0f564",

"metadata": {},

"source": [

"### 3.3 Load\n",

"\n",

"Now, let's store the DataFrame table that we created on our local disk so that we can use it later. We choose to convert it to a CSV format. It is quite simple with Pandas dataframes."

]

},

{

"cell\_type": "code",

"execution\_count": 58,

"id": "d7133a7c",

"metadata": {},

"outputs": [],

"source": [

"final\_data.to\_csv(\"EstesPark\_Weather\_January\_2023.csv\")"

]

},

{

"cell\_type": "markdown",

"id": "2bc971d4",

"metadata": {},

"source": [

"## Exercise E1: ETL data for January 2006\n",

"\n",

"- Repeat the steps shown in section 2 and 3 above for January 2006. \n",

"- Extract January 2006 data from https://www.estesparkweather.net/archive\_reports.php?date=200601\n",

"- Perform transform steps in the same way as shown in 3.2 and save the data on your laptop. \n",

"- Describe \"Average temperature\" using `describe()` function shown under 3.2. What differences do you see between January 2023 and January 2006. Does it hint a possiblity of global warming? Write down in a markdown block. "

]

},

{

"cell\_type": "code",

"execution\_count": 149,

"id": "4a4c3038",

"metadata": {},

"outputs": [

{

"name": "stdout",

"output\_type": "stream",

"text": [

"Webpage opened successfully...\n",

"Webpage loaded and parsed successfully...\n"

]

},

{

"data": {

"text/html": [

"<div>\n",

"<style scoped>\n",

" .dataframe tbody tr th:only-of-type {\n",

" vertical-align: middle;\n",

" }\n",

"\n",

" .dataframe tbody tr th {\n",

" vertical-align: top;\n",

" }\n",

"\n",

" .dataframe thead th {\n",

" text-align: right;\n",

" }\n",

"</style>\n",

"<table border=\"1\" class=\"dataframe\">\n",

" <thead>\n",

" <tr style=\"text-align: right;\">\n",

" <th></th>\n",

" <th>Average and Extremes</th>\n",

" <th>Average temperature</th>\n",

" <th>Average humidity</th>\n",

" <th>Average dewpoint</th>\n",

" <th>Average barometer</th>\n",

" <th>Average windspeed</th>\n",

" <th>Average gustspeed</th>\n",

" <th>Average direction</th>\n",

" <th>Rainfall for month</th>\n",

" <th>Rainfall for year</th>\n",

" <th>Maximum rain per minute</th>\n",

" <th>Maximum temperature</th>\n",

" <th>Minimum temperature</th>\n",

" <th>Maximum humidity</th>\n",

" <th>Minimum humidity</th>\n",

" <th>Maximum pressure</th>\n",

" <th>Minimum pressure</th>\n",

" <th>Maximum windspeed</th>\n",

" <th>Maximum gust speed</th>\n",

" <th>Maximum heat index</th>\n",

" </tr>\n",

" </thead>\n",

" <tbody>\n",

" <tr>\n",

" <th>0</th>\n",

" <td>Apr 1</td>\n",

" <td>35.4°F</td>\n",

" <td>44%</td>\n",

" <td>13.0°F</td>\n",

" <td>30.0 in.</td>\n",

" <td>5.2 mph</td>\n",

" <td>8.2 mph</td>\n",

" <td>283° (WNW)</td>\n",

" <td>0.00 in.</td>\n",

" <td>1.08 in.</td>\n",

" <td>0.00 in. on day 01 at time 00:00</td>\n",

" <td>49.9°F on day 01 at time 16:28</td>\n",

" <td>18.1°F on day 01 at time 05:18</td>\n",

" <td>82% on day 01 at time 05:22</td>\n",

" <td>17% on day 01 at time 16:31</td>\n",

" <td>30.080 in. on day 01 at time 00:00</td>\n",

" <td>29.779 in. on day 01 at time 16:25</td>\n",

" <td>18.4 mph on day 01 at time 20:54</td>\n",

" <td>25.3 mph from 283 °(WNW) on day 01 at time 2...</td>\n",

" <td>49.9°F on day 01 at time 16:28</td>\n",

" </tr>\n",

" <tr>\n",

" <th>1</th>\n",

" <td>Apr 2</td>\n",

" <td>34.2°F</td>\n",

" <td>83%</td>\n",

" <td>29.4°F</td>\n",

" <td>29.9 in.</td>\n",

" <td>2.5 mph</td>\n",

" <td>3.8 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.08 in.</td>\n",

" <td>1.16 in.</td>\n",

" <td>0.01 in. on day 02 at time 23:56</td>\n",

" <td>39.6°F on day 02 at time 17:33</td>\n",

" <td>28.8°F on day 02 at time 06:02</td>\n",

" <td>90% on day 02 at time 23:59</td>\n",

" <td>69% on day 02 at time 17:53</td>\n",

" <td>29.960 in. on day 02 at time 00:06</td>\n",

" <td>29.785 in. on day 02 at time 23:59</td>\n",

" <td>10.4 mph on day 02 at time 15:25</td>\n",

" <td>12.7 mph from 283 °(WNW) on day 02 at time 1...</td>\n",

" <td>39.6°F on day 02 at time 17:33</td>\n",

" </tr>\n",

" <tr>\n",

" <th>2</th>\n",

" <td>Apr 3</td>\n",

" <td>39.3°F</td>\n",

" <td>67%</td>\n",

" <td>27.3°F</td>\n",

" <td>29.7 in.</td>\n",

" <td>4.1 mph</td>\n",

" <td>6.0 mph</td>\n",

" <td>283° (WNW)</td>\n",

" <td>0.10 in.</td>\n",

" <td>1.18 in.</td>\n",

" <td>0.01 in. on day 03 at time 09:08</td>\n",

" <td>50.7°F on day 03 at time 18:08</td>\n",

" <td>30.7°F on day 03 at time 07:35</td>\n",

" <td>92% on day 03 at time 06:42</td>\n",

" <td>27% on day 03 at time 18:22</td>\n",

" <td>29.863 in. on day 03 at time 23:58</td>\n",

" <td>29.669 in. on day 03 at time 14:56</td>\n",

" <td>17.3 mph on day 03 at time 13:06</td>\n",

" <td>26.5 mph from 284 °(WNW) on day 03 at time 1...</td>\n",

" <td>50.7°F on day 03 at time 18:08</td>\n",

" </tr>\n",

" <tr>\n",

" <th>3</th>\n",

" <td>Apr 4</td>\n",

" <td>43.6°F</td>\n",

" <td>46%</td>\n",

" <td>23.4°F</td>\n",

" <td>29.8 in.</td>\n",

" <td>6.3 mph</td>\n",

" <td>9.0 mph</td>\n",

" <td>283° (WNW)</td>\n",

" <td>0.10 in.</td>\n",

" <td>1.18 in.</td>\n",

" <td>0.00 in. on day 04 at time 23:59</td>\n",

" <td>53.9°F on day 04 at time 15:43</td>\n",

" <td>30.9°F on day 04 at time 01:09</td>\n",

" <td>87% on day 04 at time 01:14</td>\n",

" <td>30% on day 04 at time 16:10</td>\n",

" <td>29.969 in. on day 04 at time 11:18</td>\n",

" <td>29.743 in. on day 04 at time 16:14</td>\n",

" <td>16.1 mph on day 04 at time 15:50</td>\n",

" <td>26.5 mph from 281 °( W ) on day 04 at time 0...</td>\n",

" <td>53.9°F on day 04 at time 15:43</td>\n",

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" <th>4</th>\n",

" <td>Apr 5</td>\n",

" <td>45.8°F</td>\n",

" <td>38%</td>\n",

" <td>17.7°F</td>\n",

" <td>29.7 in.</td>\n",

" <td>4.0 mph</td>\n",

" <td>6.3 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.10 in.</td>\n",

" <td>1.18 in.</td>\n",

" <td>0.00 in. on day 05 at time 23:59</td>\n",

" <td>60.5°F on day 05 at time 16:19</td>\n",

" <td>31.6°F on day 05 at time 03:30</td>\n",

" <td>72% on day 05 at time 04:14</td>\n",

" <td>14% on day 05 at time 17:29</td>\n",

" <td>29.867 in. on day 05 at time 00:08</td>\n",

" <td>29.560 in. on day 05 at time 20:19</td>\n",

" <td>15.0 mph on day 05 at time 14:08</td>\n",

" <td>25.3 mph from 280 °( W ) on day 05 at time 1...</td>\n",

" <td>60.5°F on day 05 at time 16:19</td>\n",

" </tr>\n",

" <tr>\n",

" <th>5</th>\n",

" <td>Apr 6</td>\n",

" <td>44.1°F</td>\n",

" <td>42%</td>\n",

" <td>21.3°F</td>\n",

" <td>29.7 in.</td>\n",

" <td>6.1 mph</td>\n",

" <td>9.1 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.10 in.</td>\n",

" <td>1.18 in.</td>\n",

" <td>0.00 in. on day 06 at time 23:59</td>\n",

" <td>58.1°F on day 06 at time 13:11</td>\n",

" <td>31.2°F on day 06 at time 04:36</td>\n",

" <td>64% on day 06 at time 22:48</td>\n",

" <td>24% on day 06 at time 13:22</td>\n",

" <td>29.756 in. on day 06 at time 22:52</td>\n",

" <td>29.600 in. on day 06 at time 13:14</td>\n",

" <td>24.2 mph on day 06 at time 17:48</td>\n",

" <td>35.7 mph from 281 °( W ) on day 06 at time 2...</td>\n",

" <td>58.1°F on day 06 at time 13:11</td>\n",

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" <th>6</th>\n",

" <td>Apr 7</td>\n",

" <td>47.9°F</td>\n",

" <td>28%</td>\n",

" <td>15.9°F</td>\n",

" <td>29.8 in.</td>\n",

" <td>11.0 mph</td>\n",

" <td>15.7 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.10 in.</td>\n",

" <td>1.18 in.</td>\n",

" <td>0.00 in. on day 07 at time 23:59</td>\n",

" <td>60.4°F on day 07 at time 16:45</td>\n",

" <td>37.2°F on day 07 at time 05:29</td>\n",

" <td>43% on day 07 at time 03:11</td>\n",

" <td>18% on day 07 at time 16:24</td>\n",

" <td>29.937 in. on day 07 at time 09:16</td>\n",

" <td>29.673 in. on day 07 at time 00:23</td>\n",

" <td>21.9 mph on day 07 at time 23:22</td>\n",

" <td>35.7 mph from 281 °( W ) on day 07 at time 0...</td>\n",

" <td>60.4°F on day 07 at time 16:45</td>\n",

" </tr>\n",

" <tr>\n",

" <th>7</th>\n",

" <td>Apr 8</td>\n",

" <td>52.2°F</td>\n",

" <td>29%</td>\n",

" <td>20.3°F</td>\n",

" <td>29.8 in.</td>\n",

" <td>7.9 mph</td>\n",

" <td>11.8 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.10 in.</td>\n",

" <td>1.18 in.</td>\n",

" <td>0.00 in. on day 08 at time 23:59</td>\n",

" <td>64.7°F on day 08 at time 14:17</td>\n",

" <td>43.2°F on day 08 at time 23:59</td>\n",

" <td>43% on day 08 at time 23:56</td>\n",

" <td>16% on day 08 at time 15:01</td>\n",

" <td>29.903 in. on day 08 at time 06:23</td>\n",

" <td>29.721 in. on day 08 at time 15:10</td>\n",

" <td>18.4 mph on day 08 at time 12:11</td>\n",

" <td>33.4 mph from 283 °(WNW) on day 08 at time 0...</td>\n",

" <td>64.7°F on day 08 at time 14:17</td>\n",

" </tr>\n",

" <tr>\n",

" <th>8</th>\n",

" <td>Apr 9</td>\n",

" <td>52.5°F</td>\n",

" <td>28%</td>\n",

" <td>17.2°F</td>\n",

" <td>29.5 in.</td>\n",

" <td>8.3 mph</td>\n",

" <td>11.8 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.10 in.</td>\n",

" <td>1.18 in.</td>\n",

" <td>0.00 in. on day 09 at time 23:59</td>\n",

" <td>65.6°F on day 09 at time 15:12</td>\n",

" <td>35.9°F on day 09 at time 04:30</td>\n",

" <td>59% on day 09 at time 04:33</td>\n",

" <td>12% on day 09 at time 17:55</td>\n",

" <td>29.815 in. on day 09 at time 00:10</td>\n",

" <td>29.234 in. on day 09 at time 21:23</td>\n",

" <td>25.3 mph on day 09 at time 15:53</td>\n",

" <td>34.5 mph from 283 °(WNW) on day 09 at time 1...</td>\n",

" <td>65.6°F on day 09 at time 15:12</td>\n",

" </tr>\n",

" <tr>\n",

" <th>9</th>\n",

" <td>Apr 10</td>\n",

" <td>31.9°F</td>\n",

" <td>78%</td>\n",

" <td>24.9°F</td>\n",

" <td>29.4 in.</td>\n",

" <td>5.2 mph</td>\n",

" <td>8.3 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.23 in.</td>\n",

" <td>1.31 in.</td>\n",

" <td>0.01 in. on day 10 at time 16:34</td>\n",

" <td>49.6°F on day 10 at time 00:11</td>\n",

" <td>19.2°F on day 10 at time 23:59</td>\n",

" <td>93% on day 10 at time 13:38</td>\n",

" <td>33% on day 10 at time 00:07</td>\n",

" <td>29.745 in. on day 10 at time 23:17</td>\n",

" <td>29.105 in. on day 10 at time 04:49</td>\n",

" <td>18.4 mph on day 10 at time 20:51</td>\n",

" <td>34.5 mph from 281 °( W ) on day 10 at time 0...</td>\n",

" <td>49.6°F on day 10 at time 00:11</td>\n",

" </tr>\n",

" <tr>\n",

" <th>10</th>\n",

" <td>Apr 11</td>\n",

" <td>24.5°F</td>\n",

" <td>56%</td>\n",

" <td>10.2°F</td>\n",

" <td>29.7 in.</td>\n",

" <td>5.0 mph</td>\n",

" <td>8.0 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.31 in.</td>\n",

" <td>1.39 in.</td>\n",

" <td>0.01 in. on day 11 at time 15:00</td>\n",

" <td>32.4°F on day 11 at time 14:59</td>\n",

" <td>18.3°F on day 11 at time 01:56</td>\n",

" <td>85% on day 11 at time 02:18</td>\n",

" <td>38% on day 11 at time 20:48</td>\n",

" <td>29.787 in. on day 11 at time 21:13</td>\n",

" <td>29.644 in. on day 11 at time 13:14</td>\n",

" <td>15.0 mph on day 11 at time 14:18</td>\n",

" <td>27.6 mph from 284 °(WNW) on day 11 at time 0...</td>\n",

" <td>32.4°F on day 11 at time 14:59</td>\n",

" </tr>\n",

" <tr>\n",

" <th>11</th>\n",

" <td>Apr 12</td>\n",

" <td>24.3°F</td>\n",

" <td>69%</td>\n",

" <td>15.4°F</td>\n",

" <td>29.8 in.</td>\n",

" <td>3.0 mph</td>\n",

" <td>5.0 mph</td>\n",

" <td>283° (WNW)</td>\n",

" <td>0.35 in.</td>\n",

" <td>1.43 in.</td>\n",

" <td>0.01 in. on day 12 at time 13:15</td>\n",

" <td>33.4°F on day 12 at time 09:34</td>\n",

" <td>12.6°F on day 12 at time 06:53</td>\n",

" <td>82% on day 12 at time 19:57</td>\n",

" <td>45% on day 12 at time 09:31</td>\n",

" <td>29.993 in. on day 12 at time 19:14</td>\n",

" <td>29.693 in. on day 12 at time 02:00</td>\n",

" <td>11.5 mph on day 12 at time 13:01</td>\n",

" <td>18.4 mph from 281 °( W ) on day 12 at time 1...</td>\n",

" <td>33.4°F on day 12 at time 09:34</td>\n",

" </tr>\n",

" <tr>\n",

" <th>12</th>\n",

" <td>Apr 13</td>\n",

" <td>29.3°F</td>\n",

" <td>75%</td>\n",

" <td>22.1°F</td>\n",

" <td>29.9 in.</td>\n",

" <td>2.4 mph</td>\n",

" <td>4.4 mph</td>\n",

" <td>283° (WNW)</td>\n",

" <td>0.36 in.</td>\n",

" <td>1.44 in.</td>\n",

" <td>0.01 in. on day 13 at time 08:30</td>\n",

" <td>38.5°F on day 13 at time 16:24</td>\n",

" <td>23.3°F on day 13 at time 06:06</td>\n",

" <td>89% on day 13 at time 03:49</td>\n",

" <td>44% on day 13 at time 23:59</td>\n",

" <td>30.011 in. on day 13 at time 11:00</td>\n",

" <td>29.831 in. on day 13 at time 23:52</td>\n",

" <td>16.1 mph on day 13 at time 23:53</td>\n",

" <td>26.5 mph from 284 °(WNW) on day 13 at time 2...</td>\n",

" <td>38.5°F on day 13 at time 16:24</td>\n",

" </tr>\n",

" <tr>\n",

" <th>13</th>\n",

" <td>Apr 14</td>\n",

" <td>42.0°F</td>\n",

" <td>38%</td>\n",

" <td>17.9°F</td>\n",

" <td>29.6 in.</td>\n",

" <td>12.6 mph</td>\n",

" <td>18.7 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.36 in.</td>\n",

" <td>1.44 in.</td>\n",

" <td>0.00 in. on day 14 at time 23:59</td>\n",

" <td>50.8°F on day 14 at time 15:02</td>\n",

" <td>32.8°F on day 14 at time 00:08</td>\n",

" <td>47% on day 14 at time 04:08</td>\n",

" <td>28% on day 14 at time 12:31</td>\n",

" <td>29.834 in. on day 14 at time 00:01</td>\n",

" <td>29.406 in. on day 14 at time 17:10</td>\n",

" <td>29.9 mph on day 14 at time 13:24</td>\n",

" <td>42.6 mph from 283 °(WNW) on day 14 at time 1...</td>\n",

" <td>50.8°F on day 14 at time 15:02</td>\n",

" </tr>\n",

" <tr>\n",

" <th>14</th>\n",

" <td>Apr 15</td>\n",

" <td>50.3°F</td>\n",

" <td>33%</td>\n",

" <td>21.4°F</td>\n",

" <td>29.5 in.</td>\n",

" <td>8.0 mph</td>\n",

" <td>11.1 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.36 in.</td>\n",

" <td>1.44 in.</td>\n",

" <td>0.00 in. on day 15 at time 23:59</td>\n",

" <td>60.4°F on day 15 at time 16:24</td>\n",

" <td>38.8°F on day 15 at time 23:59</td>\n",

" <td>71% on day 15 at time 23:59</td>\n",

" <td>21% on day 15 at time 17:59</td>\n",

" <td>29.598 in. on day 15 at time 22:58</td>\n",

" <td>29.373 in. on day 15 at time 04:52</td>\n",

" <td>23.0 mph on day 15 at time 15:04</td>\n",

" <td>32.2 mph from 247 °(WSW) on day 15 at time 1...</td>\n",

" <td>60.4°F on day 15 at time 16:24</td>\n",

" </tr>\n",

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" <th>15</th>\n",

" <td>Apr 16</td>\n",

" <td>44.9°F</td>\n",

" <td>55%</td>\n",

" <td>27.8°F</td>\n",

" <td>29.6 in.</td>\n",

" <td>3.4 mph</td>\n",

" <td>5.4 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.36 in.</td>\n",

" <td>1.44 in.</td>\n",

" <td>0.00 in. on day 16 at time 23:59</td>\n",

" <td>59.5°F on day 16 at time 12:22</td>\n",

" <td>31.2°F on day 16 at time 06:56</td>\n",

" <td>86% on day 16 at time 07:30</td>\n",

" <td>20% on day 16 at time 12:48</td>\n",

" <td>29.673 in. on day 16 at time 07:23</td>\n",

" <td>29.429 in. on day 16 at time 23:52</td>\n",

" <td>13.8 mph on day 16 at time 23:25</td>\n",

" <td>19.6 mph from 283 °(WNW) on day 16 at time 1...</td>\n",

" <td>59.5°F on day 16 at time 12:22</td>\n",

" </tr>\n",

" <tr>\n",

" <th>16</th>\n",

" <td>Apr 17</td>\n",

" <td>46.9°F</td>\n",

" <td>42%</td>\n",

" <td>23.6°F</td>\n",

" <td>29.6 in.</td>\n",

" <td>5.7 mph</td>\n",

" <td>8.9 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.36 in.</td>\n",

" <td>1.44 in.</td>\n",

" <td>0.00 in. on day 17 at time 23:59</td>\n",

" <td>58.4°F on day 17 at time 17:16</td>\n",

" <td>36.5°F on day 17 at time 06:44</td>\n",

" <td>67% on day 17 at time 11:33</td>\n",

" <td>18% on day 17 at time 17:17</td>\n",

" <td>29.837 in. on day 17 at time 23:55</td>\n",

" <td>29.422 in. on day 17 at time 00:01</td>\n",

" <td>16.1 mph on day 17 at time 20:57</td>\n",

" <td>24.2 mph from 281 °( W ) on day 17 at time 1...</td>\n",

" <td>58.4°F on day 17 at time 17:16</td>\n",

" </tr>\n",

" <tr>\n",

" <th>17</th>\n",

" <td>Apr 18</td>\n",

" <td>46.0°F</td>\n",

" <td>35%</td>\n",

" <td>18.3°F</td>\n",

" <td>29.9 in.</td>\n",

" <td>5.8 mph</td>\n",

" <td>9.6 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.36 in.</td>\n",

" <td>1.44 in.</td>\n",

" <td>0.00 in. on day 18 at time 23:59</td>\n",

" <td>57.6°F on day 18 at time 17:04</td>\n",

" <td>32.9°F on day 18 at time 05:03</td>\n",

" <td>62% on day 18 at time 00:43</td>\n",

" <td>19% on day 18 at time 16:47</td>\n",

" <td>29.999 in. on day 18 at time 23:52</td>\n",

" <td>29.779 in. on day 18 at time 04:28</td>\n",

" <td>16.1 mph on day 18 at time 14:32</td>\n",

" <td>31.1 mph from 283 °(WNW) on day 18 at time 1...</td>\n",

" <td>57.6°F on day 18 at time 17:04</td>\n",

" </tr>\n",

" <tr>\n",

" <th>18</th>\n",

" <td>Apr 19</td>\n",

" <td>52.4°F</td>\n",

" <td>32%</td>\n",

" <td>20.6°F</td>\n",

" <td>29.8 in.</td>\n",

" <td>4.9 mph</td>\n",

" <td>7.6 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.36 in.</td>\n",

" <td>1.44 in.</td>\n",

" <td>0.00 in. on day 19 at time 23:59</td>\n",

" <td>69.1°F on day 19 at time 15:22</td>\n",

" <td>31.8°F on day 19 at time 02:21</td>\n",

" <td>67% on day 19 at time 02:19</td>\n",

" <td>12% on day 19 at time 15:26</td>\n",

" <td>30.023 in. on day 19 at time 01:05</td>\n",

" <td>29.652 in. on day 19 at time 19:17</td>\n",

" <td>19.6 mph on day 19 at time 08:38</td>\n",

" <td>31.1 mph from 284 °(WNW) on day 19 at time 0...</td>\n",

" <td>72.4°F on day 19 at time 15:36</td>\n",

" </tr>\n",

" <tr>\n",

" <th>19</th>\n",

" <td>Apr 20</td>\n",

" <td>53.1°F</td>\n",

" <td>30%</td>\n",

" <td>19.5°F</td>\n",

" <td>29.6 in.</td>\n",

" <td>5.9 mph</td>\n",

" <td>8.7 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.36 in.</td>\n",

" <td>1.44 in.</td>\n",

" <td>0.00 in. on day 20 at time 23:59</td>\n",

" <td>69.4°F on day 20 at time 14:32</td>\n",

" <td>33.7°F on day 20 at time 02:20</td>\n",

" <td>64% on day 20 at time 02:39</td>\n",

" <td>10% on day 20 at time 14:25</td>\n",

" <td>29.766 in. on day 20 at time 00:24</td>\n",

" <td>29.371 in. on day 20 at time 15:59</td>\n",

" <td>23.0 mph on day 20 at time 17:06</td>\n",

" <td>34.5 mph from 281 °( W ) on day 20 at time 1...</td>\n",

" <td>71.7°F on day 20 at time 14:32</td>\n",

" </tr>\n",

" <tr>\n",

" <th>20</th>\n",

" <td>Apr 21</td>\n",

" <td>46.4°F</td>\n",

" <td>59%</td>\n",

" <td>30.7°F</td>\n",

" <td>29.6 in.</td>\n",

" <td>3.0 mph</td>\n",

" <td>4.9 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.52 in.</td>\n",

" <td>1.60 in.</td>\n",

" <td>0.01 in. on day 21 at time 23:18</td>\n",

" <td>57.0°F on day 21 at time 09:23</td>\n",

" <td>37.8°F on day 21 at time 21:31</td>\n",

" <td>92% on day 21 at time 23:59</td>\n",

" <td>26% on day 21 at time 10:11</td>\n",

" <td>29.905 in. on day 21 at time 23:51</td>\n",

" <td>29.375 in. on day 21 at time 01:38</td>\n",

" <td>15.0 mph on day 20 at time 00:04</td>\n",

" <td>34.5 mph from 283 °(WNW) on day 21 at time 0...</td>\n",

" <td>57.0°F on day 21 at time 09:23</td>\n",

" </tr>\n",

" <tr>\n",

" <th>21</th>\n",

" <td>Apr 22</td>\n",

" <td>36.9°F</td>\n",

" <td>89%</td>\n",

" <td>33.9°F</td>\n",

" <td>30.1 in.</td>\n",

" <td>3.3 mph</td>\n",

" <td>5.2 mph</td>\n",

" <td>281° ( W )</td>\n",

" <td>0.52 in.</td>\n",

" <td>1.60 in.</td>\n",

" <td>0.00 in. on day 22 at time 23:59</td>\n",

" <td>40.2°F on day 22 at time 16:43</td>\n",

" <td>35.0°F on day 22 at time 07:47</td>\n",

" <td>93% on day 22 at time 03:02</td>\n",

" <td>76% on day 22 at time 16:43</td>\n",

" <td>30.144 in. on day 22 at time 21:14</td>\n",

" <td>29.834 in. on day 22 at time 01:28</td>\n",

" <td>9.2 mph on day 22 at time 19:20</td>\n",

" <td>19.6 mph from 281 °( W ) on day 22 at time 0...</td>\n",

" <td>40.2°F on day 22 at time 16:43</td>\n",

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" <tr>\n",

" <th>22</th>\n",

" <td>Apr 23</td>\n",

" <td>44.6°F</td>\n",

" <td>65%</td>\n",

" <td>32.3°F</td>\n",

" <td>29.9 in.</td>\n",

" <td>1.9 mph</td>\n",

" <td>3.6 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.52 in.</td>\n",

" <td>1.60 in.</td>\n",

" <td>0.00 in. on day 23 at time 23:59</td>\n",

" <td>58.6°F on day 23 at time 18:01</td>\n",

" <td>29.3°F on day 23 at time 07:00</td>\n",

" <td>92% on day 23 at time 00:26</td>\n",

" <td>35% on day 23 at time 17:35</td>\n",

" <td>30.142 in. on day 23 at time 06:59</td>\n",

" <td>29.760 in. on day 23 at time 22:16</td>\n",

" <td>12.7 mph on day 23 at time 15:08</td>\n",

" <td>17.3 mph from 283 °(WNW) on day 23 at time 1...</td>\n",

" <td>58.6°F on day 23 at time 18:01</td>\n",

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" <tr>\n",

" <th>23</th>\n",

" <td>Apr 24</td>\n",

" <td>46.9°F</td>\n",

" <td>56%</td>\n",

" <td>29.0°F</td>\n",

" <td>29.8 in.</td>\n",

" <td>2.6 mph</td>\n",

" <td>4.3 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.53 in.</td>\n",

" <td>1.61 in.</td>\n",

" <td>0.01 in. on day 24 at time 07:41</td>\n",

" <td>63.9°F on day 24 at time 16:03</td>\n",

" <td>29.5°F on day 24 at time 05:34</td>\n",

" <td>88% on day 24 at time 06:17</td>\n",

" <td>23% on day 24 at time 16:05</td>\n",

" <td>29.871 in. on day 24 at time 07:20</td>\n",

" <td>29.648 in. on day 24 at time 23:23</td>\n",

" <td>18.4 mph on day 24 at time 17:43</td>\n",

" <td>20.7 mph from 283 °(WNW) on day 24 at time 2...</td>\n",

" <td>63.9°F on day 24 at time 16:03</td>\n",

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" <td>46.2°F</td>\n",

" <td>56%</td>\n",

" <td>30.0°F</td>\n",

" <td>29.9 in.</td>\n",

" <td>2.5 mph</td>\n",

" <td>4.5 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.54 in.</td>\n",

" <td>1.62 in.</td>\n",

" <td>0.01 in. on day 25 at time 06:14</td>\n",

" <td>56.7°F on day 25 at time 13:29</td>\n",

" <td>34.3°F on day 25 at time 23:59</td>\n",

" <td>88% on day 25 at time 07:06</td>\n",

" <td>32% on day 25 at time 13:05</td>\n",

" <td>30.026 in. on day 25 at time 21:59</td>\n",

" <td>29.667 in. on day 25 at time 00:00</td>\n",

" <td>11.5 mph on day 25 at time 12:20</td>\n",

" <td>20.7 mph from 281 °( W ) on day 25 at time 0...</td>\n",

" <td>56.7°F on day 25 at time 13:29</td>\n",

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" <th>25</th>\n",

" <td>Apr 26</td>\n",

" <td>47.5°F</td>\n",

" <td>53%</td>\n",

" <td>27.8°F</td>\n",

" <td>29.7 in.</td>\n",

" <td>7.7 mph</td>\n",

" <td>11.3 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.73 in.</td>\n",

" <td>1.81 in.</td>\n",

" <td>0.02 in. on day 26 at time 22:16</td>\n",

" <td>67.3°F on day 26 at time 14:11</td>\n",

" <td>27.9°F on day 26 at time 06:04</td>\n",

" <td>89% on day 26 at time 23:42</td>\n",

" <td>18% on day 26 at time 13:38</td>\n",

" <td>30.004 in. on day 26 at time 00:00</td>\n",

" <td>29.403 in. on day 26 at time 19:52</td>\n",

" <td>24.2 mph on day 26 at time 14:29</td>\n",

" <td>32.2 mph from 284 °(WNW) on day 26 at time 1...</td>\n",

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" <td>Apr 27</td>\n",

" <td>49.1°F</td>\n",

" <td>45%</td>\n",

" <td>27.4°F</td>\n",

" <td>29.6 in.</td>\n",

" <td>10.4 mph</td>\n",

" <td>15.6 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.73 in.</td>\n",

" <td>1.81 in.</td>\n",

" <td>0.00 in. on day 27 at time 23:59</td>\n",

" <td>58.1°F on day 27 at time 16:34</td>\n",

" <td>39.8°F on day 27 at time 23:31</td>\n",

" <td>78% on day 27 at time 00:01</td>\n",

" <td>26% on day 27 at time 13:55</td>\n",

" <td>29.694 in. on day 27 at time 10:16</td>\n",

" <td>29.400 in. on day 27 at time 23:50</td>\n",

" <td>29.9 mph on day 27 at time 04:02</td>\n",

" <td>48.3 mph from 281 °( W ) on day 27 at time 0...</td>\n",

" <td>58.1°F on day 27 at time 16:34</td>\n",

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" <td>48.7°F</td>\n",

" <td>50%</td>\n",

" <td>28.9°F</td>\n",

" <td>29.4 in.</td>\n",

" <td>13.6 mph</td>\n",

" <td>19.9 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.81 in.</td>\n",

" <td>1.89 in.</td>\n",

" <td>0.01 in. on day 28 at time 19:53</td>\n",

" <td>59.8°F on day 28 at time 12:14</td>\n",

" <td>35.0°F on day 28 at time 23:59</td>\n",

" <td>81% on day 28 at time 22:32</td>\n",

" <td>24% on day 28 at time 01:42</td>\n",

" <td>29.685 in. on day 28 at time 23:59</td>\n",

" <td>29.231 in. on day 28 at time 11:51</td>\n",

" <td>31.1 mph on day 28 at time 12:07</td>\n",

" <td>43.7 mph from 284 °(WNW) on day 28 at time 1...</td>\n",

" <td>59.8°F on day 28 at time 12:14</td>\n",

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" <th>28</th>\n",

" <td>Apr 29</td>\n",

" <td>26.2°F</td>\n",

" <td>85%</td>\n",

" <td>22.3°F</td>\n",

" <td>30.0 in.</td>\n",

" <td>2.1 mph</td>\n",

" <td>3.7 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>0.82 in.</td>\n",

" <td>1.90 in.</td>\n",

" <td>0.01 in. on day 29 at time 15:24</td>\n",

" <td>35.0°F on day 29 at time 00:03</td>\n",

" <td>21.3°F on day 29 at time 13:02</td>\n",

" <td>91% on day 29 at time 23:59</td>\n",

" <td>77% on day 29 at time 06:02</td>\n",

" <td>30.112 in. on day 29 at time 12:32</td>\n",

" <td>29.685 in. on day 29 at time 00:00</td>\n",

" <td>10.4 mph on day 28 at time 00:40</td>\n",

" <td>12.7 mph from 284 °(WNW) on day 29 at time 0...</td>\n",

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" <td>Apr 30</td>\n",

" <td>29.8°F</td>\n",

" <td>94%</td>\n",

" <td>28.3°F</td>\n",

" <td>29.8 in.</td>\n",

" <td>2.7 mph</td>\n",

" <td>4.1 mph</td>\n",

" <td>278° ( W )</td>\n",

" <td>1.44 in.</td>\n",

" <td>2.52 in.</td>\n",

" <td>0.02 in. on day 30 at time 10:10</td>\n",

" <td>37.3°F on day 30 at time 13:16</td>\n",

" <td>22.5°F on day 30 at time 05:56</td>\n",

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" <td>88% on day 30 at time 09:22</td>\n",

" <td>30.076 in. on day 30 at time 00:18</td>\n",

" <td>29.661 in. on day 30 at time 13:05</td>\n",

" <td>13.8 mph on day 30 at time 11:54</td>\n",

" <td>18.4 mph from 284 °(WNW) on day 30 at time 1...</td>\n",

" <td>37.3°F on day 30 at time 13:16</td>\n",

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" <th>30</th>\n",

" <td>for Month of April 2019 up to day 30</td>\n",

" <td>42.1°F</td>\n",

" <td>53%</td>\n",

" <td>23.3°F</td>\n",

" <td>29.738 in.</td>\n",

" <td>5.6 mph</td>\n",

" <td>8.5 mph</td>\n",

" <td>282° (WNW)</td>\n",

" <td>1.437 in.</td>\n",

" <td>2.520 in.</td>\n",

" <td>0.020 in on day 30 at time 10:10</td>\n",

" <td>69.4°F on day 20 at time 14:32</td>\n",

" <td>12.6°F on day 12 at time 06:53</td>\n",

" <td>100% on day 30 at time 23:54</td>\n",

" <td>10% on day 20 at time 14:25</td>\n",

" <td>30.14 in. on day 22 at time 21:14</td>\n",

" <td>29.11 in. on day 10 at time 04:49</td>\n",

" <td>31.1 mph from 284°(WNW) on day 28 at time 12:07</td>\n",

" <td>48.3 mph from 293°(WNW) on day 27 at time 04:01</td>\n",

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"1 Apr 2 34.2°F \n",

"2 Apr 3 39.3°F \n",

"3 Apr 4 43.6°F \n",

"4 Apr 5 45.8°F \n",

"5 Apr 6 44.1°F \n",

"6 Apr 7 47.9°F \n",

"7 Apr 8 52.2°F \n",

"8 Apr 9 52.5°F \n",

"9 Apr 10 31.9°F \n",

"10 Apr 11 24.5°F \n",

"11 Apr 12 24.3°F \n",

"12 Apr 13 29.3°F \n",

"13 Apr 14 42.0°F \n",

"14 Apr 15 50.3°F \n",

"15 Apr 16 44.9°F \n",

"16 Apr 17 46.9°F \n",

"17 Apr 18 46.0°F \n",

"18 Apr 19 52.4°F \n",

"19 Apr 20 53.1°F \n",

"20 Apr 21 46.4°F \n",

"21 Apr 22 36.9°F \n",

"22 Apr 23 44.6°F \n",

"23 Apr 24 46.9°F \n",

"24 Apr 25 46.2°F \n",

"25 Apr 26 47.5°F \n",

"26 Apr 27 49.1°F \n",

"27 Apr 28 48.7°F \n",

"28 Apr 29 26.2°F \n",

"29 Apr 30 29.8°F \n",

"30 for Month of April 2019 up to day 30 42.1°F \n",

"\n",

" Average humidity Average dewpoint Average barometer Average windspeed \\\n",

"0 44% 13.0°F 30.0 in. 5.2 mph \n",

"1 83% 29.4°F 29.9 in. 2.5 mph \n",

"2 67% 27.3°F 29.7 in. 4.1 mph \n",

"3 46% 23.4°F 29.8 in. 6.3 mph \n",

"4 38% 17.7°F 29.7 in. 4.0 mph \n",

"5 42% 21.3°F 29.7 in. 6.1 mph \n",

"6 28% 15.9°F 29.8 in. 11.0 mph \n",

"7 29% 20.3°F 29.8 in. 7.9 mph \n",

"8 28% 17.2°F 29.5 in. 8.3 mph \n",

"9 78% 24.9°F 29.4 in. 5.2 mph \n",

"10 56% 10.2°F 29.7 in. 5.0 mph \n",

"11 69% 15.4°F 29.8 in. 3.0 mph \n",

"12 75% 22.1°F 29.9 in. 2.4 mph \n",

"13 38% 17.9°F 29.6 in. 12.6 mph \n",

"14 33% 21.4°F 29.5 in. 8.0 mph \n",

"15 55% 27.8°F 29.6 in. 3.4 mph \n",

"16 42% 23.6°F 29.6 in. 5.7 mph \n",

"17 35% 18.3°F 29.9 in. 5.8 mph \n",

"18 32% 20.6°F 29.8 in. 4.9 mph \n",

"19 30% 19.5°F 29.6 in. 5.9 mph \n",

"20 59% 30.7°F 29.6 in. 3.0 mph \n",

"21 89% 33.9°F 30.1 in. 3.3 mph \n",

"22 65% 32.3°F 29.9 in. 1.9 mph \n",

"23 56% 29.0°F 29.8 in. 2.6 mph \n",

"24 56% 30.0°F 29.9 in. 2.5 mph \n",

"25 53% 27.8°F 29.7 in. 7.7 mph \n",

"26 45% 27.4°F 29.6 in. 10.4 mph \n",

"27 50% 28.9°F 29.4 in. 13.6 mph \n",

"28 85% 22.3°F 30.0 in. 2.1 mph \n",

"29 94% 28.3°F 29.8 in. 2.7 mph \n",

"30 53% 23.3°F 29.738 in. 5.6 mph \n",

"\n",

" Average gustspeed Average direction Rainfall for month Rainfall for year \\\n",

"0 8.2 mph 283° (WNW) 0.00 in. 1.08 in. \n",

"1 3.8 mph 282° (WNW) 0.08 in. 1.16 in. \n",

"2 6.0 mph 283° (WNW) 0.10 in. 1.18 in. \n",

"3 9.0 mph 283° (WNW) 0.10 in. 1.18 in. \n",

"4 6.3 mph 282° (WNW) 0.10 in. 1.18 in. \n",

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"6 15.7 mph 282° (WNW) 0.10 in. 1.18 in. \n",

"7 11.8 mph 282° (WNW) 0.10 in. 1.18 in. \n",

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"13 18.7 mph 282° (WNW) 0.36 in. 1.44 in. \n",

"14 11.1 mph 282° (WNW) 0.36 in. 1.44 in. \n",

"15 5.4 mph 282° (WNW) 0.36 in. 1.44 in. \n",

"16 8.9 mph 282° (WNW) 0.36 in. 1.44 in. \n",

"17 9.6 mph 282° (WNW) 0.36 in. 1.44 in. \n",

"18 7.6 mph 282° (WNW) 0.36 in. 1.44 in. \n",

"19 8.7 mph 282° (WNW) 0.36 in. 1.44 in. \n",

"20 4.9 mph 282° (WNW) 0.52 in. 1.60 in. \n",

"21 5.2 mph 281° ( W ) 0.52 in. 1.60 in. \n",

"22 3.6 mph 282° (WNW) 0.52 in. 1.60 in. \n",

"23 4.3 mph 282° (WNW) 0.53 in. 1.61 in. \n",

"24 4.5 mph 282° (WNW) 0.54 in. 1.62 in. \n",

"25 11.3 mph 282° (WNW) 0.73 in. 1.81 in. \n",

"26 15.6 mph 282° (WNW) 0.73 in. 1.81 in. \n",

"27 19.9 mph 282° (WNW) 0.81 in. 1.89 in. \n",

"28 3.7 mph 282° (WNW) 0.82 in. 1.90 in. \n",

"29 4.1 mph 278° ( W ) 1.44 in. 2.52 in. \n",

"30 8.5 mph 282° (WNW) 1.437 in. 2.520 in. \n",

"\n",

" Maximum rain per minute Maximum temperature \\\n",

"0 0.00 in. on day 01 at time 00:00 49.9°F on day 01 at time 16:28 \n",

"1 0.01 in. on day 02 at time 23:56 39.6°F on day 02 at time 17:33 \n",

"2 0.01 in. on day 03 at time 09:08 50.7°F on day 03 at time 18:08 \n",

"3 0.00 in. on day 04 at time 23:59 53.9°F on day 04 at time 15:43 \n",

"4 0.00 in. on day 05 at time 23:59 60.5°F on day 05 at time 16:19 \n",

"5 0.00 in. on day 06 at time 23:59 58.1°F on day 06 at time 13:11 \n",

"6 0.00 in. on day 07 at time 23:59 60.4°F on day 07 at time 16:45 \n",

"7 0.00 in. on day 08 at time 23:59 64.7°F on day 08 at time 14:17 \n",

"8 0.00 in. on day 09 at time 23:59 65.6°F on day 09 at time 15:12 \n",

"9 0.01 in. on day 10 at time 16:34 49.6°F on day 10 at time 00:11 \n",

"10 0.01 in. on day 11 at time 15:00 32.4°F on day 11 at time 14:59 \n",

"11 0.01 in. on day 12 at time 13:15 33.4°F on day 12 at time 09:34 \n",

"12 0.01 in. on day 13 at time 08:30 38.5°F on day 13 at time 16:24 \n",

"13 0.00 in. on day 14 at time 23:59 50.8°F on day 14 at time 15:02 \n",

"14 0.00 in. on day 15 at time 23:59 60.4°F on day 15 at time 16:24 \n",

"15 0.00 in. on day 16 at time 23:59 59.5°F on day 16 at time 12:22 \n",

"16 0.00 in. on day 17 at time 23:59 58.4°F on day 17 at time 17:16 \n",

"17 0.00 in. on day 18 at time 23:59 57.6°F on day 18 at time 17:04 \n",

"18 0.00 in. on day 19 at time 23:59 69.1°F on day 19 at time 15:22 \n",

"19 0.00 in. on day 20 at time 23:59 69.4°F on day 20 at time 14:32 \n",

"20 0.01 in. on day 21 at time 23:18 57.0°F on day 21 at time 09:23 \n",

"21 0.00 in. on day 22 at time 23:59 40.2°F on day 22 at time 16:43 \n",

"22 0.00 in. on day 23 at time 23:59 58.6°F on day 23 at time 18:01 \n",

"23 0.01 in. on day 24 at time 07:41 63.9°F on day 24 at time 16:03 \n",

"24 0.01 in. on day 25 at time 06:14 56.7°F on day 25 at time 13:29 \n",

"25 0.02 in. on day 26 at time 22:16 67.3°F on day 26 at time 14:11 \n",

"26 0.00 in. on day 27 at time 23:59 58.1°F on day 27 at time 16:34 \n",

"27 0.01 in. on day 28 at time 19:53 59.8°F on day 28 at time 12:14 \n",

"28 0.01 in. on day 29 at time 15:24 35.0°F on day 29 at time 00:03 \n",

"29 0.02 in. on day 30 at time 10:10 37.3°F on day 30 at time 13:16 \n",

"30 0.020 in on day 30 at time 10:10 69.4°F on day 20 at time 14:32 \n",

"\n",

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"0 18.1°F on day 01 at time 05:18 82% on day 01 at time 05:22 \n",

"1 28.8°F on day 02 at time 06:02 90% on day 02 at time 23:59 \n",

"2 30.7°F on day 03 at time 07:35 92% on day 03 at time 06:42 \n",

"3 30.9°F on day 04 at time 01:09 87% on day 04 at time 01:14 \n",

"4 31.6°F on day 05 at time 03:30 72% on day 05 at time 04:14 \n",

"5 31.2°F on day 06 at time 04:36 64% on day 06 at time 22:48 \n",

"6 37.2°F on day 07 at time 05:29 43% on day 07 at time 03:11 \n",

"7 43.2°F on day 08 at time 23:59 43% on day 08 at time 23:56 \n",

"8 35.9°F on day 09 at time 04:30 59% on day 09 at time 04:33 \n",

"9 19.2°F on day 10 at time 23:59 93% on day 10 at time 13:38 \n",

"10 18.3°F on day 11 at time 01:56 85% on day 11 at time 02:18 \n",

"11 12.6°F on day 12 at time 06:53 82% on day 12 at time 19:57 \n",

"12 23.3°F on day 13 at time 06:06 89% on day 13 at time 03:49 \n",

"13 32.8°F on day 14 at time 00:08 47% on day 14 at time 04:08 \n",

"14 38.8°F on day 15 at time 23:59 71% on day 15 at time 23:59 \n",

"15 31.2°F on day 16 at time 06:56 86% on day 16 at time 07:30 \n",

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"17 32.9°F on day 18 at time 05:03 62% on day 18 at time 00:43 \n",

"18 31.8°F on day 19 at time 02:21 67% on day 19 at time 02:19 \n",

"19 33.7°F on day 20 at time 02:20 64% on day 20 at time 02:39 \n",

"20 37.8°F on day 21 at time 21:31 92% on day 21 at time 23:59 \n",

"21 35.0°F on day 22 at time 07:47 93% on day 22 at time 03:02 \n",

"22 29.3°F on day 23 at time 07:00 92% on day 23 at time 00:26 \n",

"23 29.5°F on day 24 at time 05:34 88% on day 24 at time 06:17 \n",

"24 34.3°F on day 25 at time 23:59 88% on day 25 at time 07:06 \n",

"25 27.9°F on day 26 at time 06:04 89% on day 26 at time 23:42 \n",

"26 39.8°F on day 27 at time 23:31 78% on day 27 at time 00:01 \n",

"27 35.0°F on day 28 at time 23:59 81% on day 28 at time 22:32 \n",

"28 21.3°F on day 29 at time 13:02 91% on day 29 at time 23:59 \n",

"29 22.5°F on day 30 at time 05:56 100% on day 30 at time 23:59 \n",

"30 12.6°F on day 12 at time 06:53 100% on day 30 at time 23:54 \n",

"\n",

" Minimum humidity Maximum pressure \\\n",

"0 17% on day 01 at time 16:31 30.080 in. on day 01 at time 00:00 \n",

"1 69% on day 02 at time 17:53 29.960 in. on day 02 at time 00:06 \n",

"2 27% on day 03 at time 18:22 29.863 in. on day 03 at time 23:58 \n",

"3 30% on day 04 at time 16:10 29.969 in. on day 04 at time 11:18 \n",

"4 14% on day 05 at time 17:29 29.867 in. on day 05 at time 00:08 \n",

"5 24% on day 06 at time 13:22 29.756 in. on day 06 at time 22:52 \n",

"6 18% on day 07 at time 16:24 29.937 in. on day 07 at time 09:16 \n",

"7 16% on day 08 at time 15:01 29.903 in. on day 08 at time 06:23 \n",

"8 12% on day 09 at time 17:55 29.815 in. on day 09 at time 00:10 \n",

"9 33% on day 10 at time 00:07 29.745 in. on day 10 at time 23:17 \n",

"10 38% on day 11 at time 20:48 29.787 in. on day 11 at time 21:13 \n",

"11 45% on day 12 at time 09:31 29.993 in. on day 12 at time 19:14 \n",

"12 44% on day 13 at time 23:59 30.011 in. on day 13 at time 11:00 \n",

"13 28% on day 14 at time 12:31 29.834 in. on day 14 at time 00:01 \n",

"14 21% on day 15 at time 17:59 29.598 in. on day 15 at time 22:58 \n",

"15 20% on day 16 at time 12:48 29.673 in. on day 16 at time 07:23 \n",

"16 18% on day 17 at time 17:17 29.837 in. on day 17 at time 23:55 \n",

"17 19% on day 18 at time 16:47 29.999 in. on day 18 at time 23:52 \n",

"18 12% on day 19 at time 15:26 30.023 in. on day 19 at time 01:05 \n",

"19 10% on day 20 at time 14:25 29.766 in. on day 20 at time 00:24 \n",

"20 26% on day 21 at time 10:11 29.905 in. on day 21 at time 23:51 \n",

"21 76% on day 22 at time 16:43 30.144 in. on day 22 at time 21:14 \n",

"22 35% on day 23 at time 17:35 30.142 in. on day 23 at time 06:59 \n",

"23 23% on day 24 at time 16:05 29.871 in. on day 24 at time 07:20 \n",

"24 32% on day 25 at time 13:05 30.026 in. on day 25 at time 21:59 \n",

"25 18% on day 26 at time 13:38 30.004 in. on day 26 at time 00:00 \n",

"26 26% on day 27 at time 13:55 29.694 in. on day 27 at time 10:16 \n",

"27 24% on day 28 at time 01:42 29.685 in. on day 28 at time 23:59 \n",

"28 77% on day 29 at time 06:02 30.112 in. on day 29 at time 12:32 \n",

"29 88% on day 30 at time 09:22 30.076 in. on day 30 at time 00:18 \n",

"30 10% on day 20 at time 14:25 30.14 in. on day 22 at time 21:14 \n",

"\n",

" Minimum pressure \\\n",

"0 29.779 in. on day 01 at time 16:25 \n",

"1 29.785 in. on day 02 at time 23:59 \n",

"2 29.669 in. on day 03 at time 14:56 \n",

"3 29.743 in. on day 04 at time 16:14 \n",

"4 29.560 in. on day 05 at time 20:19 \n",

"5 29.600 in. on day 06 at time 13:14 \n",

"6 29.673 in. on day 07 at time 00:23 \n",

"7 29.721 in. on day 08 at time 15:10 \n",

"8 29.234 in. on day 09 at time 21:23 \n",

"9 29.105 in. on day 10 at time 04:49 \n",

"10 29.644 in. on day 11 at time 13:14 \n",

"11 29.693 in. on day 12 at time 02:00 \n",

"12 29.831 in. on day 13 at time 23:52 \n",

"13 29.406 in. on day 14 at time 17:10 \n",

"14 29.373 in. on day 15 at time 04:52 \n",

"15 29.429 in. on day 16 at time 23:52 \n",

"16 29.422 in. on day 17 at time 00:01 \n",

"17 29.779 in. on day 18 at time 04:28 \n",

"18 29.652 in. on day 19 at time 19:17 \n",

"19 29.371 in. on day 20 at time 15:59 \n",

"20 29.375 in. on day 21 at time 01:38 \n",

"21 29.834 in. on day 22 at time 01:28 \n",

"22 29.760 in. on day 23 at time 22:16 \n",

"23 29.648 in. on day 24 at time 23:23 \n",

"24 29.667 in. on day 25 at time 00:00 \n",

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"27 29.231 in. on day 28 at time 11:51 \n",

"28 29.685 in. on day 29 at time 00:00 \n",

"29 29.661 in. on day 30 at time 13:05 \n",

"30 29.11 in. on day 10 at time 04:49 \n",

"\n",

" Maximum windspeed \\\n",

"0 18.4 mph on day 01 at time 20:54 \n",

"1 10.4 mph on day 02 at time 15:25 \n",

"2 17.3 mph on day 03 at time 13:06 \n",

"3 16.1 mph on day 04 at time 15:50 \n",

"4 15.0 mph on day 05 at time 14:08 \n",

"5 24.2 mph on day 06 at time 17:48 \n",

"6 21.9 mph on day 07 at time 23:22 \n",

"7 18.4 mph on day 08 at time 12:11 \n",

"8 25.3 mph on day 09 at time 15:53 \n",

"9 18.4 mph on day 10 at time 20:51 \n",

"10 15.0 mph on day 11 at time 14:18 \n",

"11 11.5 mph on day 12 at time 13:01 \n",

"12 16.1 mph on day 13 at time 23:53 \n",

"13 29.9 mph on day 14 at time 13:24 \n",

"14 23.0 mph on day 15 at time 15:04 \n",

"15 13.8 mph on day 16 at time 23:25 \n",

"16 16.1 mph on day 17 at time 20:57 \n",

"17 16.1 mph on day 18 at time 14:32 \n",

"18 19.6 mph on day 19 at time 08:38 \n",

"19 23.0 mph on day 20 at time 17:06 \n",

"20 15.0 mph on day 20 at time 00:04 \n",

"21 9.2 mph on day 22 at time 19:20 \n",

"22 12.7 mph on day 23 at time 15:08 \n",

"23 18.4 mph on day 24 at time 17:43 \n",

"24 11.5 mph on day 25 at time 12:20 \n",

"25 24.2 mph on day 26 at time 14:29 \n",

"26 29.9 mph on day 27 at time 04:02 \n",

"27 31.1 mph on day 28 at time 12:07 \n",

"28 10.4 mph on day 28 at time 00:40 \n",

"29 13.8 mph on day 30 at time 11:54 \n",

"30 31.1 mph from 284°(WNW) on day 28 at time 12:07 \n",

"\n",

" Maximum gust speed \\\n",

"0 25.3 mph from 283 °(WNW) on day 01 at time 2... \n",

"1 12.7 mph from 283 °(WNW) on day 02 at time 1... \n",

"2 26.5 mph from 284 °(WNW) on day 03 at time 1... \n",

"3 26.5 mph from 281 °( W ) on day 04 at time 0... \n",

"4 25.3 mph from 280 °( W ) on day 05 at time 1... \n",

"5 35.7 mph from 281 °( W ) on day 06 at time 2... \n",

"6 35.7 mph from 281 °( W ) on day 07 at time 0... \n",

"7 33.4 mph from 283 °(WNW) on day 08 at time 0... \n",

"8 34.5 mph from 283 °(WNW) on day 09 at time 1... \n",

"9 34.5 mph from 281 °( W ) on day 10 at time 0... \n",

"10 27.6 mph from 284 °(WNW) on day 11 at time 0... \n",

"11 18.4 mph from 281 °( W ) on day 12 at time 1... \n",

"12 26.5 mph from 284 °(WNW) on day 13 at time 2... \n",

"13 42.6 mph from 283 °(WNW) on day 14 at time 1... \n",

"14 32.2 mph from 247 °(WSW) on day 15 at time 1... \n",

"15 19.6 mph from 283 °(WNW) on day 16 at time 1... \n",

"16 24.2 mph from 281 °( W ) on day 17 at time 1... \n",

"17 31.1 mph from 283 °(WNW) on day 18 at time 1... \n",

"18 31.1 mph from 284 °(WNW) on day 19 at time 0... \n",

"19 34.5 mph from 281 °( W ) on day 20 at time 1... \n",

"20 34.5 mph from 283 °(WNW) on day 21 at time 0... \n",

"21 19.6 mph from 281 °( W ) on day 22 at time 0... \n",

"22 17.3 mph from 283 °(WNW) on day 23 at time 1... \n",

"23 20.7 mph from 283 °(WNW) on day 24 at time 2... \n",

"24 20.7 mph from 281 °( W ) on day 25 at time 0... \n",

"25 32.2 mph from 284 °(WNW) on day 26 at time 1... \n",

"26 48.3 mph from 281 °( W ) on day 27 at time 0... \n",

"27 43.7 mph from 284 °(WNW) on day 28 at time 1... \n",

"28 12.7 mph from 284 °(WNW) on day 29 at time 0... \n",

"29 18.4 mph from 284 °(WNW) on day 30 at time 1... \n",

"30 48.3 mph from 293°(WNW) on day 27 at time 04:01 \n",

"\n",

" Maximum heat index \n",

"0 49.9°F on day 01 at time 16:28 \n",

"1 39.6°F on day 02 at time 17:33 \n",

"2 50.7°F on day 03 at time 18:08 \n",

"3 53.9°F on day 04 at time 15:43 \n",

"4 60.5°F on day 05 at time 16:19 \n",

"5 58.1°F on day 06 at time 13:11 \n",

"6 60.4°F on day 07 at time 16:45 \n",

"7 64.7°F on day 08 at time 14:17 \n",

"8 65.6°F on day 09 at time 15:12 \n",

"9 49.6°F on day 10 at time 00:11 \n",

"10 32.4°F on day 11 at time 14:59 \n",

"11 33.4°F on day 12 at time 09:34 \n",

"12 38.5°F on day 13 at time 16:24 \n",

"13 50.8°F on day 14 at time 15:02 \n",

"14 60.4°F on day 15 at time 16:24 \n",

"15 59.5°F on day 16 at time 12:22 \n",

"16 58.4°F on day 17 at time 17:16 \n",

"17 57.6°F on day 18 at time 17:04 \n",

"18 72.4°F on day 19 at time 15:36 \n",

"19 71.7°F on day 20 at time 14:32 \n",

"20 57.0°F on day 21 at time 09:23 \n",

"21 40.2°F on day 22 at time 16:43 \n",

"22 58.6°F on day 23 at time 18:01 \n",

"23 63.9°F on day 24 at time 16:03 \n",

"24 56.7°F on day 25 at time 13:29 \n",

"25 67.3°F on day 26 at time 14:11 \n",

"26 58.1°F on day 27 at time 16:34 \n",

"27 59.8°F on day 28 at time 12:14 \n",

"28 35.0°F on day 29 at time 00:03 \n",

"29 37.3°F on day 30 at time 13:16 \n",

"30 72.4°F on day 19 at time 15:36 "

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"opened\_webpage = requests.get(\"https://www.estesparkweather.net/archive\_reports.php?date=200601\")\n",

"print (\"Webpage opened successfully...\")\n",

"\n",

"def clearn\_string\_and\_convert(s):\n",

" s = s.replace(\"%\",\"\")\n",

" s = s.replace(\"°F\",\"\")\n",

" s = s.replace(\"in.\",\"\")\n",

" s = s.replace(\"mph\",\"\")\n",

" s = s.split(\"(\")[0]\n",

" converted = float(s)\n",

" return converted\n",

"\n",

"# Initialize a BeautifulSoup object to read and parse the webpage read\n",

"# This is like calling the \_\_init\_\_ function in BeautifulSoup\n",

"bs = BeautifulSoup(opened\_webpage.content, \"html.parser\")\n",

"print (\"Webpage loaded and parsed successfully...\")\n",

"column\_names = [\"Average and Extremes\", \"Average temperature\",\n",

" \"Average humidity\",\"Average dewpoint\",\n",

" \"Average barometer\",\"Average windspeed\",\n",

" \"Average gustspeed\",\"Average direction\",\n",

" \"Rainfall for month\",\"Rainfall for year\",\n",

" \"Maximum rain per minute\",\"Maximum temperature\",\n",

" \"Minimum temperature\",\"Maximum humidity\",\n",

" \"Minimum humidity\",\"Maximum pressure\",\n",

" \"Minimum pressure\",\"Maximum windspeed\",\n",

" \"Maximum gust speed\",\"Maximum heat index\"]\n",

"\n",

"final\_data = []\n",

"\n",

"for l in raw\_data:\n",

" entries = l.split(\"\\n\")\n",

" row = {} # empty dictionary for every row\n",

" for entry in entries:\n",

" for column\_name in column\_names:\n",

" if column\_name in entry:\n",

" entry = entry.replace(column\_name,\"\")\n",

" row[column\_name] = entry\n",

" break # stops the inner loop here because we already find a match\n",

" final\_data.append(row)\n",

"\n",

"\n",

"final\_data = pandas.DataFrame(final\_data)\n",

"\n",

"# Print a few elements in the dataframe\n",

"final\_data.head(31)"

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"## Exercise E2: Commit and push this ipynb file into your github repository\n",

"\n",

"After completing E1, add, commit and push this ipynb file into your github repository that you created in Hands\_on3. Share your github link in a Markdown block below before turning this ipynb file into Canvas. "

]

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"## Question: How much extra time did you need?"

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