Introduction

One of the big events in my hometown of Bloomsburg, Pennsylvania is the annual Bloomsburg Fair. The Bloomsburg Fair is the largest agricultural fair in Pennsylvania and occurs from late September to early October each year. When talking to my grandfather one day, he described wearing winter coats when visiting the fair in the 1960s and 1970s because of the cold temperatures. In my lifetime, I do not recall the weather during the fair ever being cold enough that a heavy coat is required. I decided to investigate the temperature differences during the fair from the 1960s and 1970s to the current time.

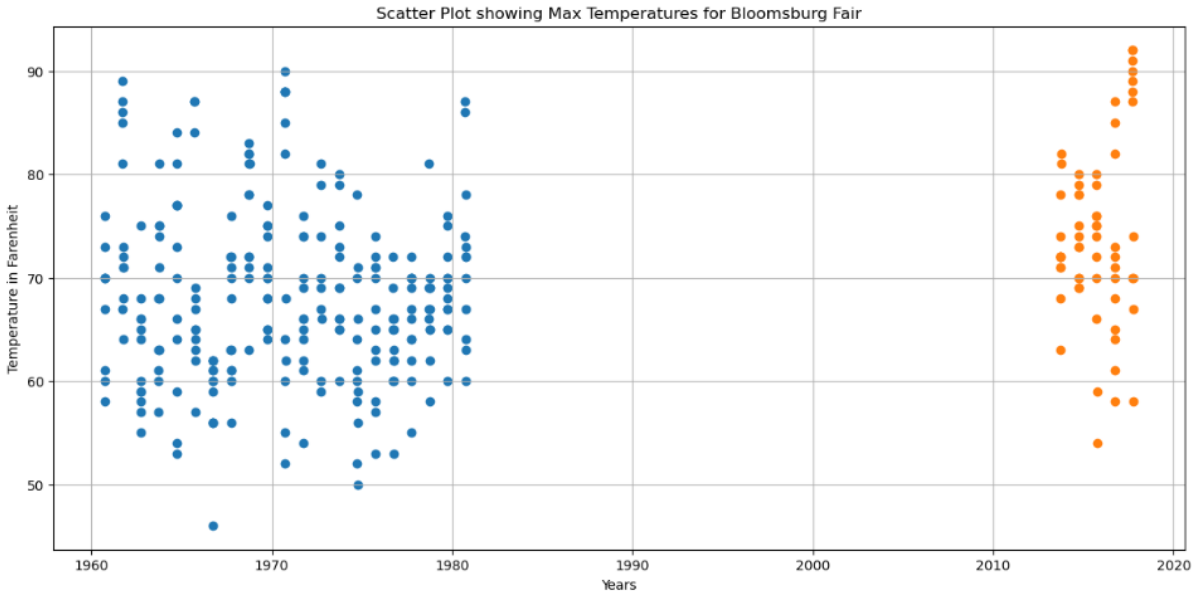
Methodology

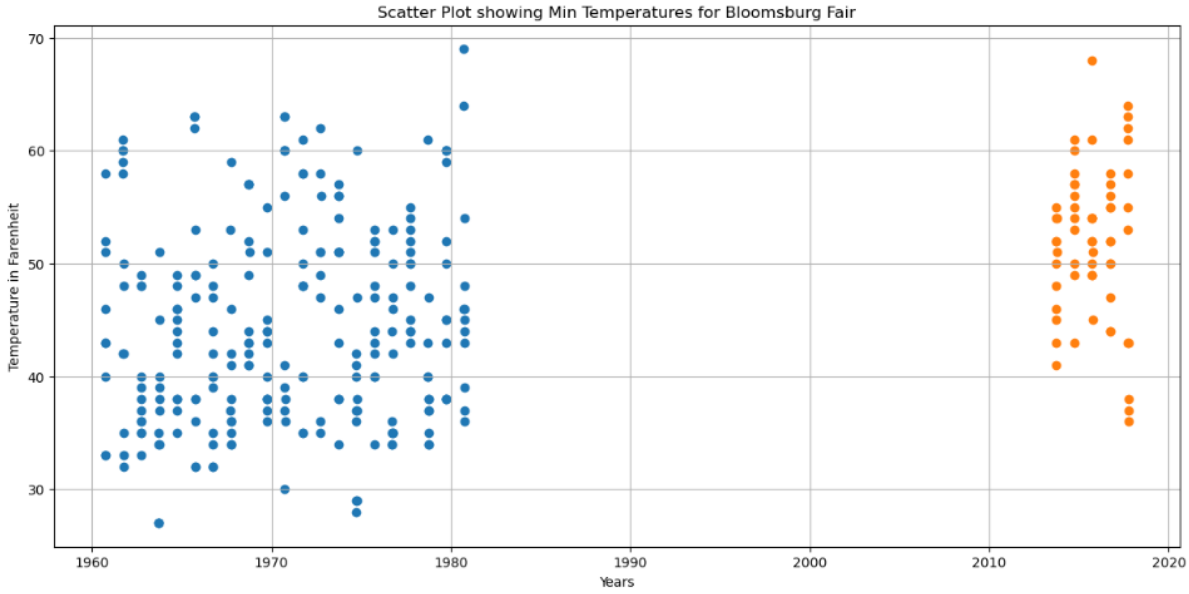
- Data Collection and Sources. I obtained all the data for this project through the National Climatic Data Center's Climate Data Online (CDO) repository. I queried the repository for all temperature data for the Bloomsburg area from September 25, 1960 to October 4, 1980 and from September 25, 2013 to October 4, 2017. CDO does not have temperature data for the Bloomsburg area after June 30, 2018. The original CSV files for the data are available at GitHub.
- Data Wrangling. I utilized Python's Pandas library to ingest and clean the CSV files. I filtered the data to include only the dates between September 25 to October 4 for each year because these dates are approximately when the fair occurs each year. I also filtered out all weather stations with null temperature values.The Python scripts used for cleaning the data are available at GitHub.
- Data Analysis. I calculated basic statistics such as mean, median, and percentiles for the temperature.
- Data Visualization. I used Python's Matplotlib library to visualize the temperature data in scatter plots and box plots.
- Presentation.

Results

The mean max temperature during fair week from 1960 to 1980: 68 degrees Farenheit
The mean min temperature during fair week from 1960 to 1980: 44 degrees Farenheit
The mean max temperature during fair week from 2013 to 2017: 74 degrees Farenheit
The mean min temperature during fair week from 2013 to 2017: 51 degrees Farenheit

The median max temperature during fair week from 1960 to 1980: 67 degrees Farenheit
The median min temperature during fair week from 1960 to 1980: 43 degrees Farenheit
The median max temperature during fair week from 2013 to 2017: 73 degrees Farenheit
The median min temperature during fair week from 2013 to 2017: 52 degrees Farenheit


Scatter Plot showing Max Temperatures for Bloomsburg Fair
Temperature in Farenheit
Years
90
80
70
60
50
1960
1970
1980
1990
2000
2010
2020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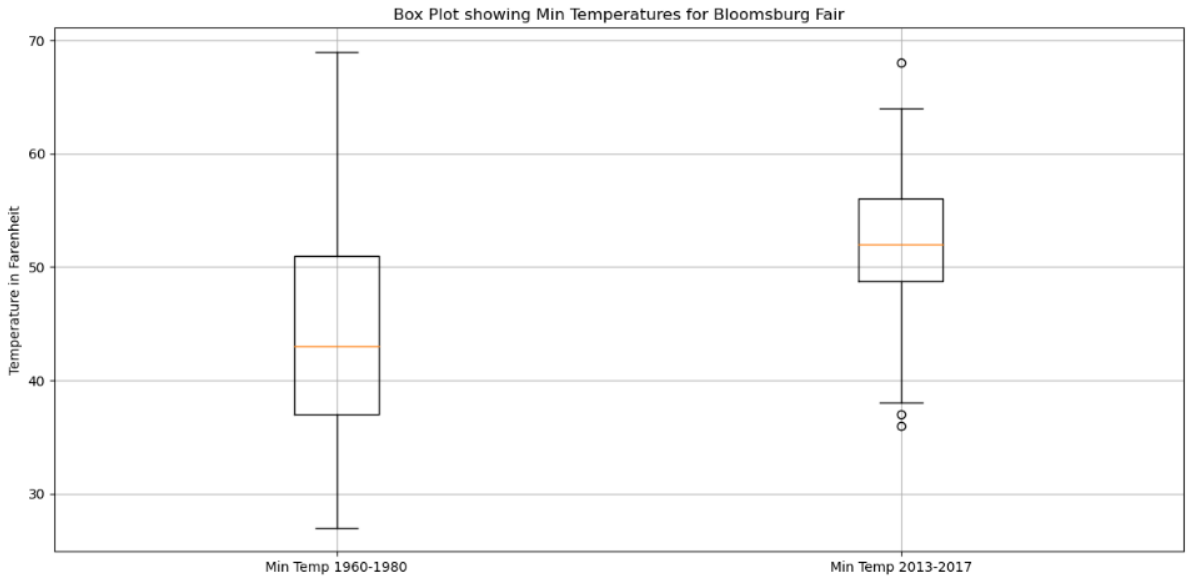

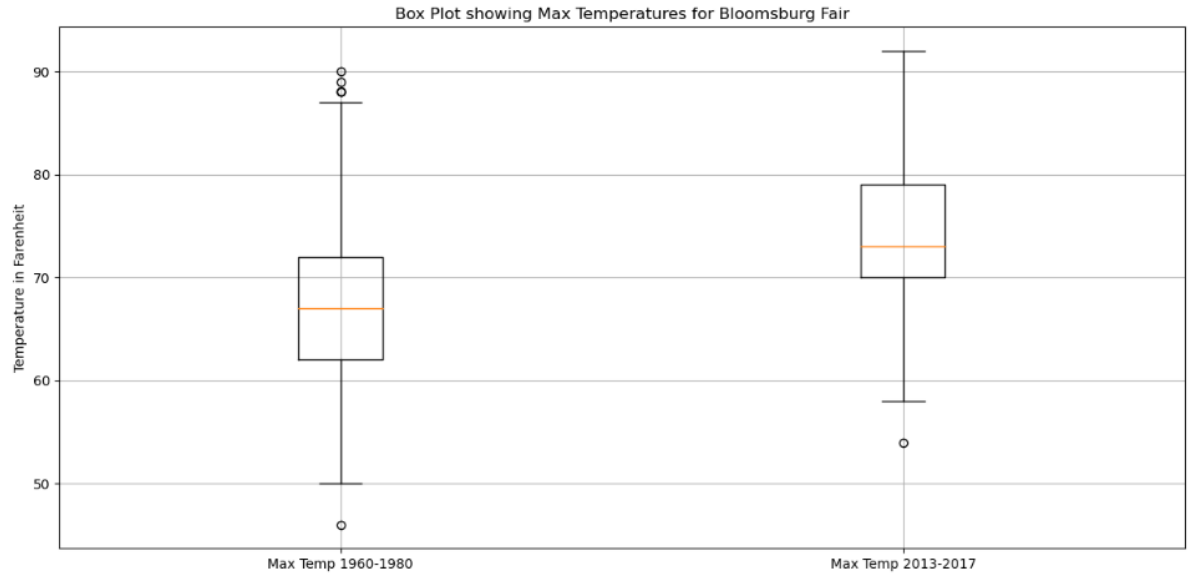

Findings & Implications

Findings

- The median minimal temperature from 2013 to 2017 was 9 degrees higher than the median minimal temperature from 1960 to 1980. The average minimal temperature from 2013 to 2017 was 7 degrees higher than the average minimal temperature from 1960 to 1980.
- The median maximum temperature from 2013 to 2017 was 6 degrees higher than the median maximum temperature from 1960 to 1980. The average maximum temperature from 2013 to 2017 was also 6 degrees higher than the average maximum temperature from 1960 to 1980.

- From 1960 to 1980, there were 87 days during fair week that had minimal temperatures below 40 degrees - including 7 days that had minimal temperatures below 32 degrees . From 2013 to 2017, there were 3 days during fair week that had minimal temperatures below 40 degrees and there were no days that had minimal temperatures below 32 degrees.

Implications

- While the CDO repository had limited records for the Bloomsburg area in the 21st century, fair weeks becoming warmer is consistent with Pennsylvania experiencing a long-term warming of more than 1.8 degrees Farenheit over the past 110 years.
- Warmer temperatures during fair week could affect the fair in a variety of ways. Some possible examples include:
    - An increase in heat-related illnesses among both humans and livestock.
    - Visitors change their buying habits regarding certain foods and goods.
    - Increasing temperatures and changing weather patterns could affect fair attendance - especially on rainy days or hotter days.