

**ENGG 233 Final Project**  
**Calgary Weather Analyzer**  
**Milestone 2**

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**Lecture:** L03

**TA Group:** Group Red

### Section 1: Get Minimum Temperature of 1990-2019

```
Minimum Temperature (Year/Month/Temp): [1992, 1, -15.9]
```

Using the provided source (CalgaryWeather.csv), the program determined that the minimum temperature from the year 1990 – 2019 was -15.9 in the year 1992 and the month of January.

### Section 2: Get maximum Temperature of 1990-2019

```
Maximum Temperature (Year/Month/Temp): [2019, 7, 23.5]
```

Using the same source, the program determined the maximum temperature between 1990-2019 to be 23.5 in the year 2019 and the month July.

### Section 3: Get Minimum Temperature of 1990-2019 Annually

| Minimum Annual Temperatures: |        |        |
|------------------------------|--------|--------|
| Year                         | 2000   | 2011   |
| Month                        | 1      | 1      |
| Temp                         | -15.14 | -13.21 |
| 1990                         | 2001   | 2012   |
| 1                            | 1      | 1      |
| -15.84                       | -15.03 | -13.41 |
| 1991                         | 2002   | 2013   |
| 1                            | 1      | 1      |
| -15.71                       | -14.62 | -12.93 |
| 1992                         | 2003   | 2014   |
| 1                            | 1      | 1      |
| -15.9                        | -14.34 | -12.92 |
| 1993                         | 2004   | 2015   |
| 1                            | 1      | 1      |
| -15.67                       | -14.32 | -12.92 |
| 1994                         | 2005   | 2016   |
| 1                            | 1      | 1      |
| -15.66                       | -14.15 | -12.81 |
| 1995                         | 2006   | 2017   |
| 1                            | 1      | 1      |
| -15.77                       | -14.19 | -12.95 |
| 1996                         | 2007   | 2018   |
| 1                            | 1      | 1      |
| -15.63                       | -14.04 | -13.08 |
| 1997                         | 2008   | 2019   |
| 1                            | 1      | 1      |
| -15.56                       | -13.91 | -13.02 |
| 1998                         | 2009   |        |
| 1                            | 1      |        |
| -15.61                       | -13.72 |        |
| 1999                         | 2010   |        |
| 1                            | 1      |        |
| -15.66                       | -13.49 |        |

The program determines the minimum temperature from every year and displays it. It can be seen that every minimum temperature occurs in January, and that the minimum has been on an increases trend.

#### Section 4: Get Maximum Temperature of 1990-2019 Annually

| Maximim Annual Temperatures | 2000  | 2011  |
|-----------------------------|-------|-------|
| Year                        | 7     | 7     |
| Month                       | 22.86 | 23.15 |
| Temp                        |       |       |
| 1990                        | 2001  | 2012  |
| 7                           | 7     | 7     |
| 23.36                       | 22.85 | 23.21 |
|                             | 2002  |       |
| 1991                        | 7     | 2013  |
| 7                           | 22.88 | 7     |
| 23.21                       |       | 23.28 |
|                             | 2003  |       |
| 1992                        | 7     | 2014  |
| 7                           | 23.08 | 7     |
| 23.2                        |       | 23.24 |
|                             | 2004  |       |
| 1993                        | 7     | 2015  |
| 7                           | 23.12 | 7     |
| 23.09                       |       | 23.24 |
|                             | 2005  |       |
| 1994                        | 7     | 2016  |
| 7                           | 23.12 | 7     |
| 22.93                       |       | 23.22 |
|                             | 2006  |       |
| 1995                        | 7     | 2017  |
| 7                           | 23.05 | 7     |
| 22.92                       |       | 23.29 |
|                             | 2007  |       |
| 1996                        | 7     | 2018  |
| 7                           | 23.11 | 7     |
| 22.85                       |       | 23.45 |
|                             | 2008  |       |
| 1997                        | 7     | 2019  |
| 7                           | 23.26 | 7     |
| 22.9                        |       | 23.5  |
|                             | 2009  |       |
| 1998                        | 7     |       |
| 7                           | 23.25 |       |
| 22.86                       |       |       |
|                             | 2010  |       |
| 1999                        | 7     |       |
| 7                           | 23.18 |       |
| 22.9                        |       |       |

This program determines the highest temperature within every year between 1990-2019. It can be observed that every year has its highest temperature during the month of July and that the maximum temperatures remain fairly unchanged throughout the years.

#### Section 5: Get Average Snowfall between 1990 – 2019 Annually

|  |                            |
|--|----------------------------|
| Average Snowfall Annually:<br>Year<br>Snowfall | 2004<br>10.565             |
| 1990<br>11.293333333333331                     | 2005<br>10.5525            |
| 1991<br>11.265                                 | 2006<br>10.231666666666667 |
| 1992<br>11.029166666666667                     | 2007<br>10.268333333333333 |
| 1993<br>11.090833333333334                     | 2008<br>10.4975            |
| 1994<br>10.899166666666666                     | 2009<br>10.6625            |
| 1995<br>10.818333333333333                     | 2010<br>10.769166666666663 |
| 1996<br>10.694166666666666                     | 2011<br>10.7275            |
| 1997<br>10.854166666666666                     | 2012<br>10.879999999999997 |
| 1998<br>10.7575                                | 2013<br>10.851666666666667 |
| 1999<br>10.748333333333335                     | 2014<br>10.9475            |
| 2000<br>10.65                                  | 2015<br>11.144166666666669 |
| 2001<br>10.559166666666668                     | 2016<br>11.109166666666667 |
| 2002<br>10.444166666666668                     | 2017<br>10.993333333333332 |
| 2003<br>10.313333333333334                     | 2018<br>11.210833333333333 |
|  | 2019<br>10.993636363636362 |

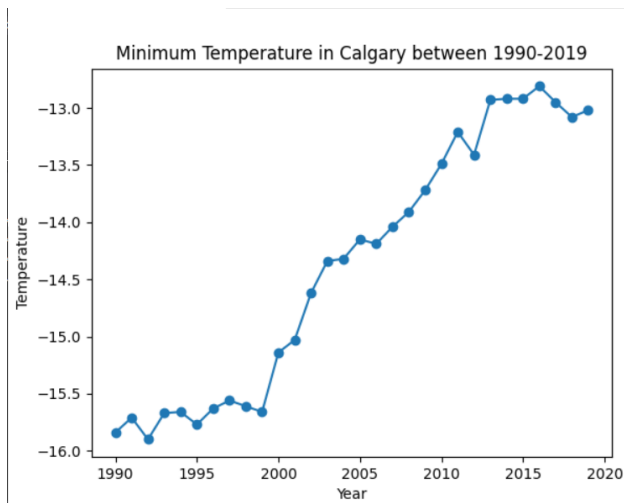
This program takes the average snowfall from every year between 1990-2019 and displays it. It can be seen that the average snowfall is relatively stable throughout the years analyzed.

## Section 6: Get Average Temperature between 1990 – 2019 Annually

|   |                           |
|---|---------------------------|
| Average Temperature Anually:<br>Year<br>Temperature | 2005<br>4.22375           |
| 1990<br>3.823749999999995                           | 2006<br>4.295             |
| 1991<br>3.83833333333334                            | 2007<br>4.29666666666667  |
| 1992<br>3.849583333333334                           | 2008<br>4.320416666666668 |
| 1993<br>3.868750000000004                           | 2009<br>4.380416666666665 |
| 1994<br>3.842083333333326                           | 2010<br>4.402916666666666 |
| 1995<br>3.865833333333346                           | 2011<br>4.420833333333334 |
| 1996<br>3.899999999999995                           | 2012<br>4.364166666666668 |
| 1997<br>3.875833333333344                           | 2013<br>4.447500000000001 |
| 1998<br>3.903333333333333                           | 2014<br>4.46875           |
| 1999<br>3.950833333333345                           | 2015<br>4.472499999999999 |
| 2000<br>4.03875                                     | 2016<br>4.555             |
| 2001<br>4.05875                                     | 2017<br>4.58625           |
| 2002<br>4.114583333333333                           | 2018<br>4.531666666666667 |
| 2003<br>4.170000000000001                           | 2019<br>5.500454545454544 |
| 2004<br>4.196666666666667                           |                           |

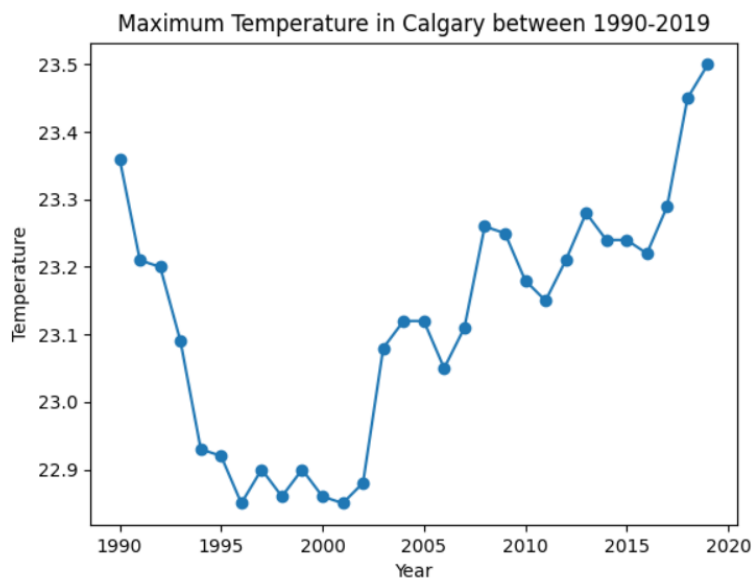
This program averages the maximum and minimum temperatures over every month and displays them as the early average. It can be seen that the average temperature over the years has followed an upwards trend with a large jump in the year 2019.

## Section 7: Line Chart Minimum Temperature of 1990-2019 Annually



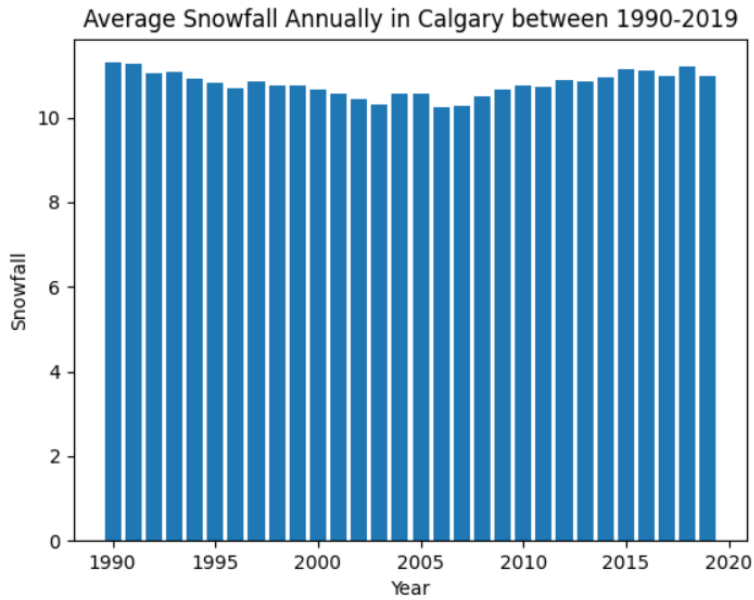
A chart that displays the yearly minimums between 1990 and 2019 is displayed. It can be seen that an upward trend is followed, but the temperature is never above -12.

#### Section 8: Line Chart Maximum Temperature of 1990-2019 Annually



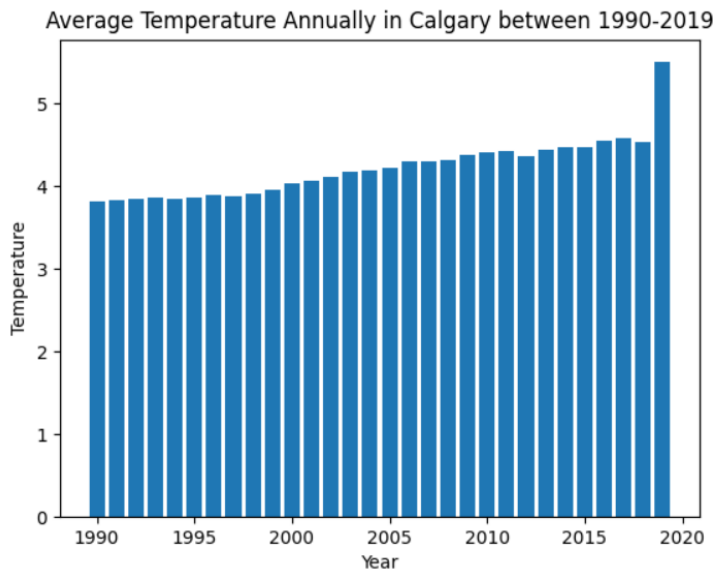
A line chart that displays the maximum temperatures in Calgary between 1990 and 2019. A large dip can be seen between the years of 1990 and 2010.

#### Section 9: Bar Chart Average Snowfall between 1990 – 2019 Annually



A bar chart that displays yearly average snowfall in Calgary between the years 1990 and 2019. It can be observed that the value for average yearly snowfall is relatively constant.

**Section 10: Bar Chart Average Temperature between 1990-2019 Annually.**



A bar chart that displays the average temperature every year between the years 1990 and 2019 in Calgary. A massive spike can be observed occurring during the year 2019.