Temperature Project

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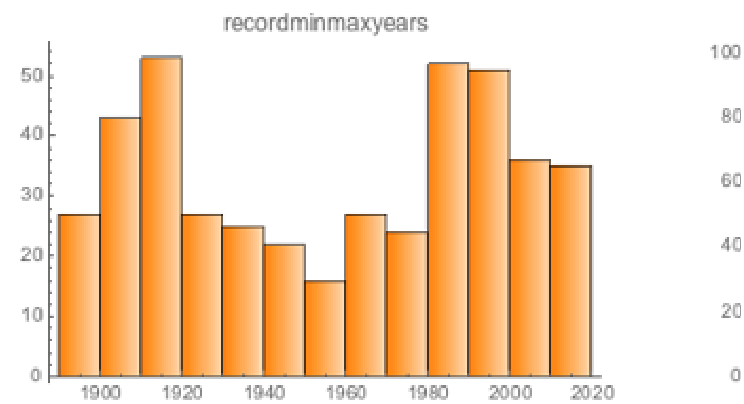
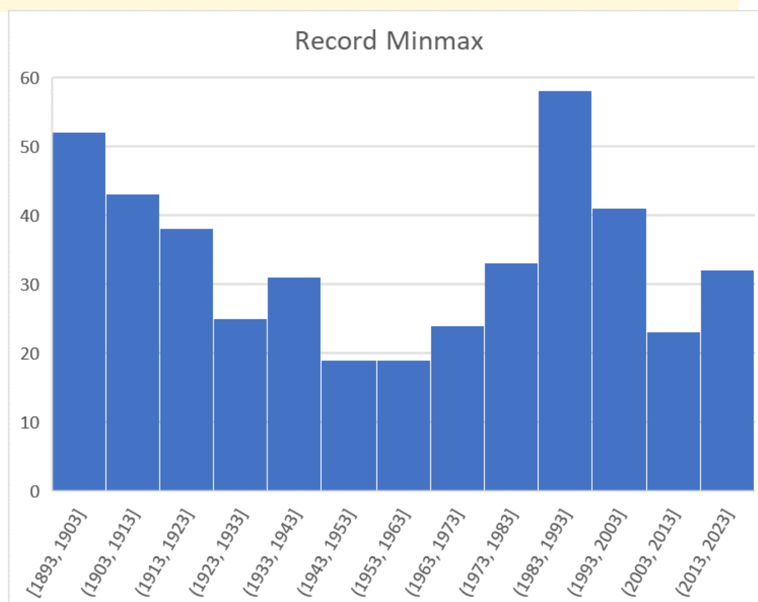
Comparison

As we can see from the Fletcher data's histogram there is a clear pattern of data. Even though the first decade is not fully present, since we are missing 3 years of data we can see still that there are two apparent spikes in the graph. These spikes are sudden however, they tail off in either direction from them until the other spike occurs. Meaning, there is no abrupt spike and fall off but instead a slow increase and decrease from the spiked decade. That means there was no dramatic increase in just one decade of Min-Max data points. There are decades leading up to and following this particular decade that leads us to believe that the temperature was slowly increasing to the Min-Max and decreasing after.

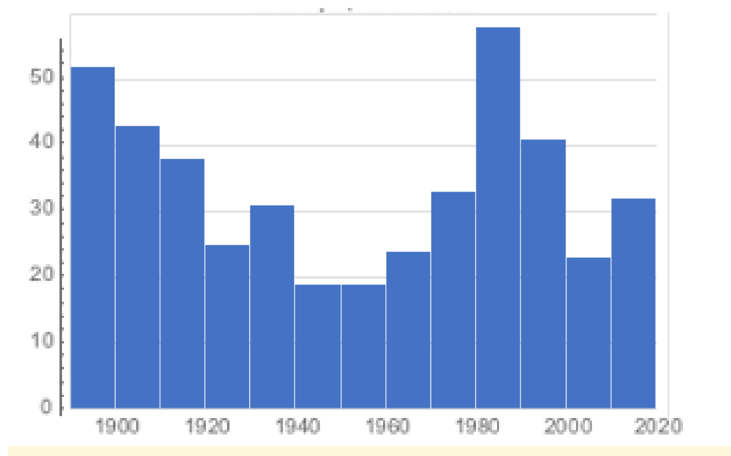


When we examine the Extreme year data values and create a histogram from them, we can see that a similar pattern is occurring. There are still two apparent spikes in the graph. These spikes are preceded and succeeded by slow tail off in data. Again, this means that there was not just a decade with dramatic spikes in Min-Max data but instead years leading up to that decade and following that decade.



Nice work Samuel - This is what I wanted for #1

Using the transparency tool we can overlap the two graphs and see some similarities in the data. We can see that the 'spike' decades occur between 1990-2000 and again around 1900-1910. These two are consistent and the decades preceding and succeeding these decades tail off to lower counts.



Another reason there could be some discrepancy is because there are far greater data points in the "Extreme year data values" compared to the "Fletcher data". There are nearly 80 more years recorded in the "Extreme year data values". I have reason to believe this is the cause for the discrepancy. Also, I am unsure if the histogram that was provided in orange includes the years that have "ties". If they were excluded that could change the data slightly. However, as far as differences go in the data I am 'chalking it up to' the difference in data points.

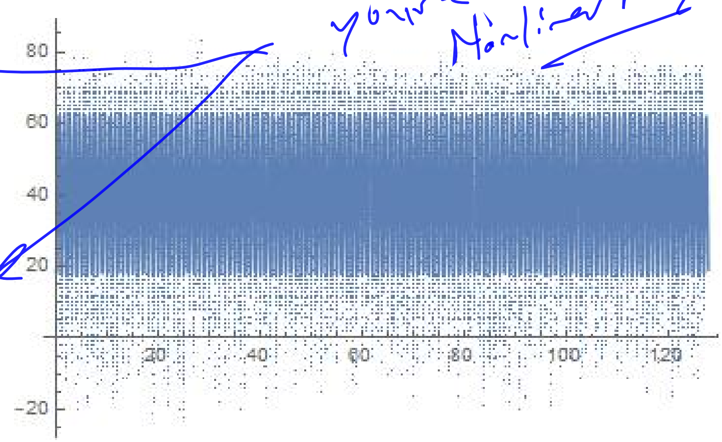
Function of time

The next task is to use the "BGdata" and make a nonlinear model of either the min or max temperatures in terms of time. Using the time of the year since 1893 being the decimal value. When I plot these, I get a large graph of points. I then used the "nonlinear" function in Mathematica to generate a line with the form

$$\alpha + \beta x + amp\ Sin[2\pi(t - phase)]$$

When I ran this, I got the following line

You're using Nonlinear Regression



After graphing the two together I got the following graph. I got a R squared value of 0.955761. This means that the model fit was really good, and it fit the data well. Using the simple linear regression, I am going to see if there is any apparent increase in temperature throughout the years. Now using the same form except this time in terms of 'x'. I got the equation of 38.85 + 0.017803*x. This means that for every year or unit on the x axis there is an increase of 0.017803. This could be very small if just taken by itself

That's an R^2 from a non-linear model. Don't trust it. If you'd have found the same model using linear regression, you get an R^2 of 0.74.

You're not using "significant" in the statistical sense.

but that means there is a slight increase over time in temperature, not a lot nor ~~that dramatic~~, but some increase non-the-less. So, when asking if the slope of the linear term is significant, I would answer that and say no, it is not significant. There is slight increase in this 120-year span but that is only a 1-degree difference over 100 years.

1°C is huge! It's why all the land ice is melting world-wide. The Global community says we can't let the rise go above 1.5°C. Two °C is really bad; 3 & 4 are catastrophic.