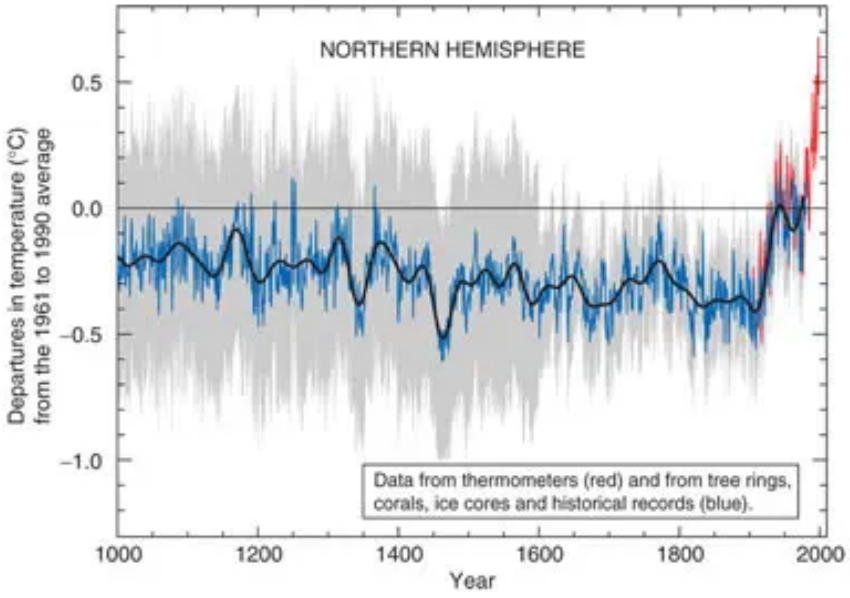
Predicting Global Temperatures

A UVA Data Science Case Study by Sharaf Tariq



The Infamous "Hockey Stick Graph" [1]

Prompt: 97% of climate experts agree that climate change not only exists, but is affected by human activity. However, skeptics believe that statistics on climate change have been falsely altered, and this idea is used to foster public uncertainty. Furthermore, the media shows the issue of climate change as a 50-50 debate, despite the consensus among experts [2]. The "Hockey Stick Graph" created by Michael Mann, a former University of Virginia environmental science professor, has been at the center of the climate change controversy for years as it is heavily contested by skeptics. Mann collected the data from tree rings, corals, and ice cores from the Northern Hemisphere. Based on the predictions, the global temperatures will rise sharply. One critique of this graph is that it is based on data from the Northern Hemisphere, so how can the data and its predictions be applied to the entire world?

Deliverable: Create a model to forecast temperatures from data collected from a global average. Then, use the model to extrapolate the data and predict future temperatures. Also, produce metrics to evaluate the accuracy of the model. See rubric and sample codes for more details.

References:

[1] M. E. Mann, R. S. Bradley, M. K. Hughes, "Northern Hemisphere Temperatures During the Past Millennium' Inferences, Uncertainties, and Limitations," *Geophysical Research Letters,* vol. 26, no. 6, Mar. 1999. [Online]. Available: https://doi.org/10.1029/1999GL900070. [Accessed May 1, 2023].

[2] C. Harvey, "Research shows — yet again — that there's no scientific debate about climate change," *The Washington Post*, para. 1-3, Apr. 15, 2016. [Online]. Available: https://www.washingtonpost.com/news/. [Accessed May 1, 2023].