**Start of Chad Madding’s Contribution**

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| |  |  | | --- | --- | | **Nottingham Castle in degrees Fahrenheit for 20 years** | **Description:** This is a regular time-series object containing average air temperatures at Nottingham Castle in degrees Fahrenheit for 20 years (1920–1939). The data is publicly available through R under "nottem" (Anderson, O.D. (1976) Time Series Analysis and Forecasting: The Box-Jenkins approach. Butterworths. Series R). R code to reproduce this information  may be found [here](https://github.com/cmadding/MSDS6373/blob/master/Unit01/AverageMonthlyTemperaturesNottingham_1920_1939.R).  x1 = 40.6, x2  = 40.8, x3 = 44.4  **Additional Realization**: Since this is monthly temperature data and this period of time only happens once, it would be impossible to obtain another realization without going back in time.  **Condition 1:**  This is 20 years of data and it looks as if there is a seasonal component to the series. Looking at the line of the mean there looks to be a slight rise over twenty years, but the first condition of a constant mean seems to be met.  **Condition 2:**  Subpopulations of X for a given time have a constant and finite variance for all t.  The assumption that the variance does not depend on time seems reasonable given the plot of the full data set. | |  | **Condition 3:**  Correlation between data points is dependent only on how far apart they are, not where they are.  Evidence of the annual seasonal trend in the series is found in the ACF (of all the data, on the top) with a spike in the autocorrelation at lag 12.  Judging from the ACFs of the first half and the second half of the series, we see evidence that the autocorrelations do not depend on where they are in time, rather just on the lag. | |

**End of Chad Madding’s Contribution**

<https://docs.google.com/document/d/1KhKA_sjdFZpSOrISRAVdeoTPkEaxhiiUY-Jfj7dH_ks/edit?usp=sharing>