LabVIEW Part 2

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Purpose:

To use LabVIEW to build a virtual instrument that measures the half life of a radioisotope, and in doing so introduce some new tools in LabVIEW such as the shift register, and how to build up arrays outside of for loops.

Procedure:

The instructions are quite extensive, but in summary they involve building a V.I. that records data from a radioactive decay source simulated by an Arduino, graphs and curve fits the data, and saves the data and other valuable constant and parameter values into a text file.

Data:

The instrument was built with easy using the explicit instructions from the Lab Module, and the helpful documentation on LabVIEW. The completed Grid and Front Panel are shown in the following figures.

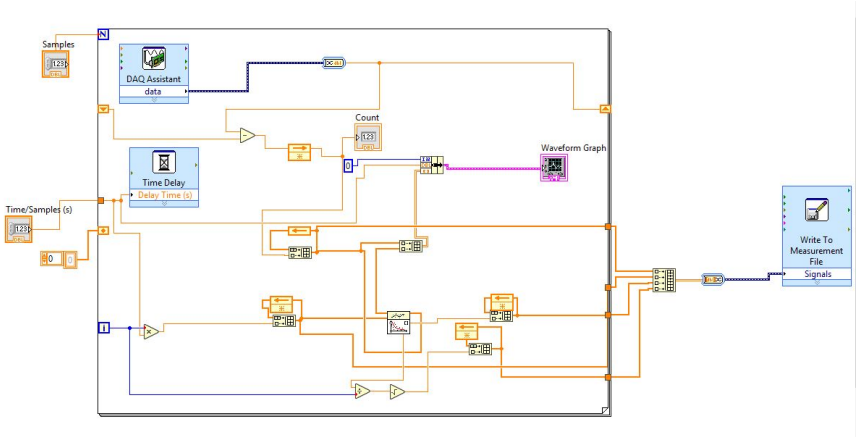

Figure 1: Grid View of V.I.

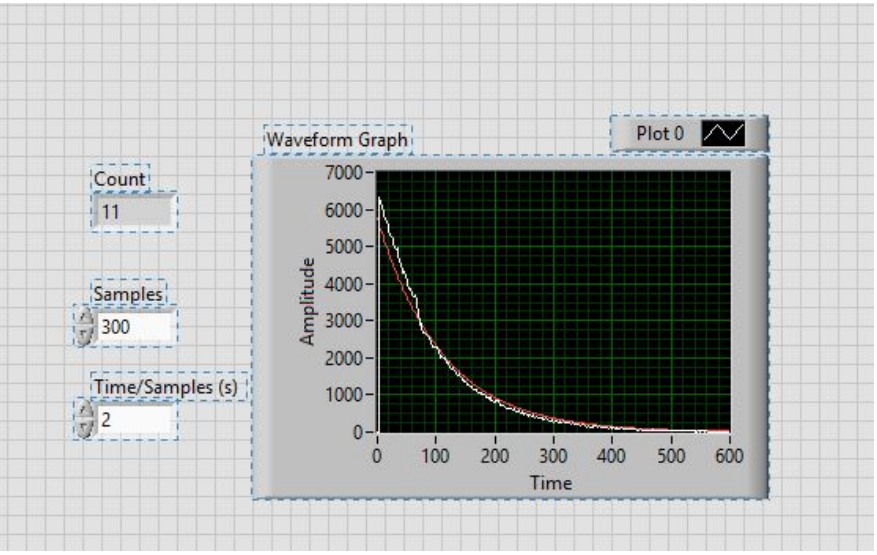

Figure 2: Front Panel View of V.I.

The curve fit tool in LabVIEW was able to extract half life and uncertainty values as well, enabling the calculation of the half life of the radioisotope. The half life of the simulated radioisotope was determined using the following relationship, and came out to be:

- $t_{\frac{1}{2}} = \frac{\ln(2)}{\lambda} = 75.7\ s$.