Simulating the Radioactive Decay Chain Utilizing a Mathematics Programming Language

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This investigation intends to deduce efficient ways to be able to simulate a biological process, specifically the radioactive decay chain, with the use of computers and programming languages. The hypothesis states that these simulations can be made utilizing a mathematics(MPL) programming language. An app is made to simulate this environment, built using MPL code and MPL User Interface Builder, Guide. The app will simulate two environments, a random Radioactive Decay Chain using a function created by the investigator and a Decay Graph made using the Half-Life of specific substances. The random Radioactive Decay Chain function includes an initial number radioactive isotopes that were marked with a random number from 1 to 6. Those that received the number 6 were marked as decayed. This process will continue until each isotope has decayed. The results are stored on a matrix, which includes the values of the time that each isotope decayed on and the quantity of isotopes per step. These values are then graphed, one axis including the time of decay and the other showing the number of isotopes remaining after each decay. The Half-Life Decay Simulation is built with two input values, the amount of substance and the half-life of that substance. The function will decrease the original amount by half for each passed half-life, then plotting the amounts for each half-life on inversely exponential graphs. The hypothesis was proven, as simulations of the radioactive decay chain were created successfully, appearing similar to real world graphs, using a mathematics programming language.

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