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Computational Verification of a Retirement Planning Tool

This report outlines the steps taken to verify the computational accuracy of a retirement planning tool called the **Retirement Scenario Tester** which forms part of the **4SIGHT Financial Tools Suite** made available to the public through www.4sight.co.za.

The Scenario Tester is a large spreadsheet allows users to enter current pension and income information so that an expected retirement fund value can be calculated. Users can then simulate the dispersal of this retirement fund to any of three financial instruments, a living annuity, an income investment fund and a growth investment fund. The scenario tester will then calculate whether or not the instruments can meet the post retirement financial needs of the user.

The multitude of tuneable parameters makes it impossible to test by hand each possible scenario available to the user. In order to gain confidence that the spreadsheet has been programmed correctly, I decided to code a simple emulator using the modelling package Mathematica. My emulator carried out the same computations but in a less user friendly fashion. I am now in a position to select a scenario and use the emulator to compute annual fund values over the lifetime of the user and compare my computed values with those produced by the 4SIGHT spreadsheet.

So far, both sets of software have produced almost identical fund values for all scenarios tested. Small discrepancies (less than R1 in R1000000) exist due to the different floating point representations employed in each system. I have attached the output of one of the scenarios tested to this document. The interested reader should be able to reproduce these results using the 4SIGHT software.

Although I have not coded all the options available in the 4SIGHT software into my Mathematica emulator, I am confident that the primary purpose of the 4SIGHT software (which is to predict the ability of post retirement funds to meet the needs of the user) has been coded correctly. As with all software of this magnitude bugs will be discovered from time to time, especially when the user group grows. However I am confident that the 4SIGHT programmers will be able to repair any reported bugs.

I have enjoyed testing this software and I will be making use of it in my own retirement planning.

Software Tester

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