

# Random input testing with *R*

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Traditional software testing uses specific inputs and then sees if the results are correct. This is necessary but not always sufficient to have faith that the software operates properly. When the number of inputs is large, the combinatorial explosion means that full coverage is impossible.

An alternative form of testing is to create random inputs and then infer the suitability of the result. This means many more combinations can be tested, and in particular avoids bias that may be in the traditional test suite. Another advantage of this type of testing is that it exercises the code throwing errors and warnings, which is seldom the case for traditional tests.

*R* is an excellent environment both for generating random inputs, and for examining the resulting output. We'll highlight a specific example of portfolio optimization.