The first step in the most inner loop is too draw a sample $u$ of length $N = 1000$ random normally distributed shocks and can use these shocks to compute a Wiener process by dividing the cumsum by the square root of $T$. After that the term u12 can be computed, which is done by multiplying the shocks $u$ by the square root of the long term correlation R^2 divided by 1-R^2. Afterwards, the Orenstein-Uhlenbeck-Process is simulated.

The second major part in the DGP is to correct the Wiener and Orenstein-Uhlenbeck-Process accordingly to the three different trend types (case). In the first case, no trendy type, we do not need to correct the processes. A constant trend is the second case, so we need to demean both processes and for the last case the processes are demeaned and detrended, as this case reflects the trend type where we have a constant trend and a drift. ----

The last common step for the simulation of all underlying test statistic is to compute different terms from the Wiener and Orenstein-Uhlenbeck-Process. For a more detailed explanation see Passavanto.

Hence, all community terms are calculated we can now calculate the test statistics of the underlying test. For some of the underlying test we just need to combine these different terms for others we need to compute some special terms additionality from the shocks or the processes. Especially for the Johansen test we need the eigenvalues of some of the terms.

After that the computed test statistic for each of the underlying test is sorted and separately stored as the null distribution and for the unsorted array of the test statistic the ranked is determent and divided by the number of simulated test statistics to derive the approximated p-values.

Since we now have all p-values from the underlying test, not sorted to still have the connection between the different tests, we can now compute the fisher type test statistic of the combined tests for non-cointegration by Bayer and Hanck. For that we sum up the logarithmic value of the test statistics. Since the package will provide two different configuration of the combined test, we first compute the test statistic for the “E\_J” configuration. For that we only use the underlying tests of Johannsen and Engel and Granger and multiply the sum by minus two. The other configuration includes “all” test and therefore we some up all 4 underlying test and this sums is also multiply by minus two. For the null distribution the values are sorted and then stored separately. Lastly the values are ranked and divided by the number of generated values to obtain the p-values.