

Automated test vector generation with TBextreme

TBextreme®, an optional supplementary module to either TBrun® or LDRAunit® revolutionizes unit testing by using the information gathered by LDRA Testbed to provide a totally automated solution for test vector generation.

Easily tuned parameters vary the nature of those vectors to suit the task in hand. You might want to maximize code coverage for quick and effective structural coverage analysis where requirements traceability is not a priority. Generate boundary values to test robustness, leveraging permissible and inadmissible boundary values. Or demonstrate the exclusion of unexpected functionality from legacy code modifications. TBextreme's potential is limited only by imagination.

Test Case	Regression P / F	Procedure
Tc 1	PASS	TunnelData::Lamp::Lamp
Tc 2	PASS	TunnelData::Lamp::InitialiseLamp
Tc 3	PASS	TunnelData::Lamp::SetLumensOutput
Tc 4	PASS	TunnelData::Lamp::SetLumensOutput
Tc 5	PASS	TunnelData::Lamp::GetMaximumLumens
Tc 6	PASS	TunnelData::Lamp::GetMinimumLumens
Tc 7	PASS	TunnelData::Lamp::SendPowerToLamp
Tc 8	PASS	TunnelData::Lamp::SendPowerToLamp
Tc 9	PASS	TunnelData::Lamp::InitialiseLamp
Tc 10	PASS	TunnelData::LampAttributes::LampAttribu
Tc 11	PASS	TunnelData::SquareLamp::SquareLamp
Tc 12	PASS	TunnelData::LampAttributes::Height
Tc 13	PASS	TunnelData::LampAttributes::Width
Tc 14	PASS	TunnelData::LampAttributes::Drain
Tc 15	PASS	TunnelData::LampAttributes::Drain
Tc 16	PASS	TunnelData::LampAttributes::Drain
Tc 17	PASS	TunnelData::LampAttributes::Drain
Tc 18	PASS	TunnelData::LampAttributes::Drain

☒ Apply Extreme Stub Return Values
 Generate Single Value for Stub Return Values
 Generate Multiple Values for Stub Return Values Using All Dictionary Values
☒ Generate Multiple Values for Stub Return Values Using Only Conditional Values
 Apply Min Mid Max Values
☒ Prevent Min Mid Max Values Being Used in Loops
☒ Optimise Values Applied to Conditions
 Apply Upper and Lower Boundaries to Conditions
 Apply Upper and Lower Boundaries to all Values for Variables Used in Conditions
 Apply Upper and Lower Boundaries to all Values
 Do Not Generate Value for Default Case in Switch Statements
 Generate Single Value for Default if Default Case Found in Switch Statements
☒ Generate Single Value for Default Case in all Switch Statements

Benefits

- creates test vectors automatically, rather than through manual entry
- capable of achieving high levels of coverage where coverage is key rather than requirements traceability
- provides fast and reliable results with considerable time and cost savings
- gaps in coverage can be seamlessly stopped through additional manual testing
- tests robustness of code by exercising admissible and inadmissible boundary conditions, null pointers, and other challenging conditions
- can be used to establish legacy code functionality prior to its modification, and to show the absence of unexpected consequences afterwards

Solution Details

- supplementary module to the TBrun component of the LDRA tool suite, or the LDRAunit point product
- generates test vectors based on information collated during static analysis
- leverages TBrun variable, parameter, and stub handling techniques to fully automate the process
- nature of auto-generated test vectors can be tuned according to suit the test process in hand
- results can be supplemented by manually created TBrun test vectors
- resulting tests can be re-run, stored and modified just as for manually created tests