

Test Case Specification

Introduction

This test specification is designed to assess the performance of an index calculation component. The outlined test cases in this document specifically target the validation of functionalities associated with the modeling process, calculation, and formatting. The primary goal is to assist the Quality Assurance (QA) team in validating the designated operation, with a focus on ensuring the reliability, integrity, and security of the calculation component.

Scope

The scope of this test specification covers an index calculation component. The test cases detailed in this document focus on verifying the functionalities related to the modeling process, calculation and formatting. This document aims to help the QA team validate the specified operation, ensuring the integrity and security of the calculation component.

References

[Test Case Outline](#)

IEEE 829-2008

Glossary

Features

Item to Test	Description	Requirements	Responsibilities
ProductSystem	Stores all the Flows and Processes		Lucas Fernandes
Process	Stores information relative to a process and to the flows associated		Lucas Fernandes
CircularityCalculator	Calculates the CircularityFlow based on a productSystem's processes and flows		Lucas Fernandes
CircularityFlow	Calculates Circularity for a specific Flow		André Ferreira
Parser	Imports information into the respective classes		André Ribeiro
Exporter	Exports information and reports about the calculations done and the processes/flows		Hélder Branco

Test Approach

To ensure the identification of errors in our software, we've implemented blackbox tests using JUnit Jupyter. For every method, we've meticulously developed ECP and BVA tables, cataloging both valid, invalid classes and testing all possibilities and impossibilities, thereby maximizing the coverage of our tests.

Tests Identification

Test Id	Feature	Description
#01_addProcess_valid	ProductSystem	
#02_addProcess_null	ProductSystem	
#03_addProcess_duplicate	ProductSystem	
#04_addFlow_valid	ProductSystem	
#05_addFlow_null	ProductSystem	
#06_addFlow_duplicate	ProductSystem	
#07_removeProcess_valid	ProductSystem	
#08_removeProcess_null	ProductSystem	
#09_removeProcess_nonExisting	ProductSystem	
#10_removeProcess_empty	ProductSystem	
#11_removeFlow_valid	ProductSystem	

Test Id	Feature	Description
#12_removeFlow_null	ProductSystem	
#13_removeFlow_nonExisting	ProductSystem	
#14_removeFlow_empty	ProductSystem	
#15_addProcessFlow_valid	Process	
#16_addProcessFlow_null	Process	
#17_addProcessFlow_duplicate	Process	
#18_removeProcess_valid	Process	
#19_removeProcess_null	Process	
#20_removeProcess_nonExisting	Process	
#21_removeProcess_empty	Process	
#22_containsByname_true	CircularityCalculator	
#23_containsByname_false	CircularityCalculator	
#24_containsByname_null	CircularityCalculator	
#25_searchCircularityFlow_nullName	CircularityCalculator	
#26_searchCircularityFlow_nullProductSystem	CircularityCalculator	
#27_searchCircularityFlow_processesEmpty	CircularityCalculator	
#28_searchCircularityFlow_processFlowsEmpty	CircularityCalculator	
#29_searchCircularityFlow_invalidFlowType	CircularityCalculator	
#30_searchCircularityFlow_flowEnergy	CircularityCalculator	
#31_searchCircularityFlow_flowMaterialNew	CircularityCalculator	
#32_searchCircularityFlow_flowServiceINew	CircularityCalculator	
#33_searchCircularityFlow_flowMaterial	CircularityCalculator	
#34_searchCircularityFlow_flowService	CircularityCalculator	
#35_searchCircularityFlow_noProcessForProduct	CircularityCalculator	
#36_updateCircularityFlows_null	CircularityCalculator	
#37_updateCircularityFlows_nullprocessFlowState	CircularityCalculator	
#38_updateCircularityFlows_emptyCircularityFlows	CircularityCalculator	
#39_updateCircularityFlows_nullProcessType	CircularityCalculator	
#40_updateCircularityFlows_V	CircularityCalculator	
#41_updateCircularityFlows_Ri	CircularityCalculator	
#42_updateCircularityFlows_R	CircularityCalculator	
#43_updateCircularityFlows_Rr	CircularityCalculator	
#44_updateCircularityFlows_Wf	CircularityCalculator	
#45_updateCircularityFlows_Wc	CircularityCalculator	
#46_searchProcessType_null	CircularityCalculator	

Test Id	Feature	Description
#47_searchProcessType_nullProductSystem	CircularityCalculator	
#48_searchProcessType_emptyProcesses	CircularityCalculator	
#49_searchProcessType_nullProcessType	CircularityCalculator	
#50_searchProcessType_invalidProcessName	CircularityCalculator	
#51_searchProcessType_primary	CircularityCalculator	
#52_searchProcessType_recycling	CircularityCalculator	
#53_searchFlow_null	CircularityCalculator	
#54_searchFlow_nullProductSystem	CircularityCalculator	
#55_searchFlow_emptyFlows	CircularityCalculator	
#56_searchFlow_invalidName	CircularityCalculator	
#57_searchFlow_valid	CircularityCalculator	
#58_calculateCircularityFlow_null	CircularityCalculator	
#59_calculateCircularityFlow_nullProductSystem	CircularityCalculator	
#60_calculateCircularityFlow_emptyProcesses	CircularityCalculator	
#61_calculateCircularityFlow_emptyFlows	CircularityCalculator	
#62_calculateCircularityFlow_valid	CircularityCalculator	
#63_calculateW_valid	CircularityFlow	
#64_calculateM_valid	CircularityFlow	
#65_calculateEp_valid	CircularityFlow	
#66_calculateEp_R_equals_0	CircularityFlow	
#67_calculateEs_valid	CircularityFlow	
#68_calculateEs_V_equals_0	CircularityFlow	
#69_calculateX_valid	CircularityFlow	
#70_calculateX_Lavg_equals_0	CircularityFlow	
#71_calculateX_Uavg_equals_0	CircularityFlow	
#72_calculateX_Lavg_and_Uavg_equals_0	CircularityFlow	
#73_calculateX_Lavg_smallerThan_0	CircularityFlow	
#74_calculateX_Uavg_smallerThan_0	CircularityFlow	
#75_calculateX_Lavg_and_Uavg_smallerThan_0	CircularityFlow	
#76_calculateFx_valid	CircularityFlow	
#77_calculateFx_x_equals_0	CircularityFlow	
#78_calculateLFI_valid	CircularityFlow	
#79_calculateLFI_negative	CircularityFlow	
#80_calculateLFI_biggerThan1	CircularityFlow	
#81_calculateLFI_denominatorEquals0	CircularityFlow	

Test Id	Feature	Description
#82_calculateLFI_Wc_BiggerThan_Wf	CircularityFlow	
#83_calculateMCIp_valid	CircularityFlow	
#84_calculateMCIp_RrAndWc_DifferentThan_R	CircularityFlow	
#85_calculateMCIp_M_smallerThan_V	CircularityFlow	
#86_calculateMCIp_W_biggerThan_M	CircularityFlow	
#87_calculateMCIp_R_BiggerThan_W	CircularityFlow	
#88_calculateMCIp_R_EqualTo_W	CircularityFlow	
#89_calculateMCIp_R_equalTo0_RrShouldBeDifferentThan_0	CircularityFlow	
#90_loadParser_valid	Parser	
#91_loadParser_null	Parser	
#92_loadParser_empty	Parser	
#93_loadParser_malformed	Parser	
#94_loadParser_invalidData	Parser	
#95_saveToCsv_Valid	Exporter	

The criteria for passing or failing the features

Each feature passes when has a cover percentage above 70%, excluding constructor, gets/sets methods, toString and related methods such like print methods.