Coverage Report for Automated_BCM_Integrated_2020b

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Analysis Information

Coverage Data Information

Collected in version	(R2020b)

Model Information

Model version	3.28
Author	99003729
Last saved	Fri Mar 26 14:42:16 2021

Simulation Optimization Options

Default parameter behavior	tunable
Block reduction	forced off
Conditional branch optimization	on

Coverage Options

Analyzed model	Automated_BCM_Integrated_2020b
Logic block short circuiting	off
MCDC mode	masking
Filter name(s):	Untitled

Objects Filtered from Coverage Analysis

Filter Untitled

File C:\Users\99003761\MATLAB\Projects\untitled456\slcov_output\Automated_BCM_Integrated_2020b\justified_ac.cvf

Description N/A

Filtered Model Object	Rationale
J1. SubSystem block "Chart"	none
J2. SubSystem block "AC_control_chart"	none

Aggregated Tests

Run	Test Name	Date
Model: "Automated_BCM_Integrated_2020b"		
T1	Run 1	26-Mar-2021 14:43:13
T2	Run 2	26-Mar-2021 14:45:55
T3	Run 3	26-Mar-2021 14:46:18
T4	Run 4	26-Mar-2021 14:48:20
T5	Run 5	26-Mar-2021 14:53:12

Summary

Model Hierarchy/Complexity

		Decision	Condition	MCDC	Execution
1. Automated_BCM_Integrated_2020b	60	100%	100%	100%	100%
2. . . . BCM_Controller_and_Plant	59	100%	100%	100%	100%
3. . . . . BCM_Cruise_Control	6	100%	100%	100%	100%
4. . . . . If Action Subsystem1	3	100%	NA	NA	100%
5. . . . . Chart	3	100%	NA	NA	NA
6. . . . . SF: BCM_Controller_and_Plant/BCM_Cruise_Control/If Action Subsystem1/Chart	2	100%	NA	NA	NA
7. . . . . BCM_HO_Controller	3	100%	100%	100%	100%
8. . . . . BCM_HO_SEBU	3	100%	NA	NA	100%
9. . . . . BCM_Sunroof	10	100%	100%	100%	NA
10. . . . . Function_Sun	10	100%	100%	100%	NA
11. . . . . BCM_Wiper_Control_System	5	100%	NA	NA	100%
12. . . . . Subsystem	35	100%	100%	100%	NA
13. . . . . AC_control_chart	35	100%	100%	100%	NA
14. . . . . SF: BCM_Controller_and_Plant/Subsystem/AC_control_chart	34	100%	100%	100%	NA
15. . . . . SF: AC_ON	2	100%	NA	NA	NA
16. . . . . SF: Auto_cond	4	100%	NA	NA	NA

Details

1. Model "Automated_BCM_Integrated_2020b"

Child Systems: BCM_Controller_and_Plant

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	1	60
Condition	NA	100% ((58+4)/62) condition outcomes
Decision	NA	100% ((77+3)/80) decision outcomes
MCDC	NA	100% ((26+4)/30) conditions reversed the outcome
Execution	NA	100% (33/33) objective outcomes

2. SubSystem block "BCM_Controller_and_Plant"

Justify or Exclude

Parent: /Automated_BCM_Integrated_2020b

Child Systems: BCM_Cruise_Control, BCM_HO_Controller, BCM_Sunroof, BCM_Wiper_Control_System, Subsystem

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	59
Condition	NA	100% ((58+4)/62) condition outcomes
Decision	NA	100% ((77+3)/80) decision outcomes
MCDC	NA	100% ((26+4)/30) conditions reversed the outcome
Execution	NA	100% (33/33) objective outcomes

3. SubSystem block "BCM_Cruise_Control"

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant

Child Systems: If Action Subsystem1

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	6
Condition	NA	100% (8/8) condition outcomes
Decision	NA	100% (10/10) decision outcomes
MCDC	NA	100% (4/4) conditions reversed the outcome
Execution	NA	100% (14/14) objective outcomes

Full Coverage

Model Object	Metric
If block "Condition 1"	Decision, Execution
If block "Condition 2"	Decision, Execution
Logic block "OR"	Condition, MCDC, Execution
Logic block "XOR"	Condition, MCDC, Execution
Switch block "Switch"	Decision, Execution
Product block "Product"	Execution
Product block "Product1"	Execution
Product block "Product2"	Execution
Product block "Product3"	Execution
Product block "Product4"	Execution
Product block "Product5"	Execution
Constant block "Constant2"	Execution
Constant block "Constant4"	Execution

4. SubSystem block "If Action Subsystem1"

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant/BCM_Cruise_Control
Child Systems: Chart

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	3
Decision	NA	100% (4/4) decision outcomes
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object	Metric
Sum block "Add"	Execution

5. SubSystem block "Chart"

Justified J1.

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant/BCM_Cruise_Control/If Action Subsystem1
Child Systems: BCM_Controller_and_Plant/BCM_Cruise_Control/If Action Subsystem1/Chart

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	1	3
Decision	NA	100% (4/4) decision outcomes

6. Chart "BCM_Controller_and_Plant/BCM_Cruise_Cont..."

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant/BCM_Cruise_Control/If Action Subsystem1/Chart

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	2
Decision	NA	100% (4/4) decision outcomes

Full Coverage

Model Object	Metric
State "main"	Decision

7. SubSystem block "BCM_HO_Controller"

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant

Child Systems: BCM_HO_SEBU

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	3
Condition	NA	100% (16/16) condition outcomes
Decision	NA	100% (6/6) decision outcomes
MCDC	NA	100% (7/7) conditions reversed the outcome
Execution	NA	100% (12/12) objective outcomes

Full Coverage

Model Object	Metric
Logic block "Condition_Stop"	Condition, Execution
Logic block "Out_Buttons"	Condition, MCDC, Execution
Logic block "XOR"	Condition, MCDC, Execution
Logic block "XOR1"	Condition, MCDC, Execution
Product block "BCM_HO_BACK_OUT"	Execution
Product block "BCM_HO_DRIVER_OUT"	Execution
Product block "BCM_HO_SENSOR_OUT"	Execution
Product block "Stop_button_condition"	Execution

8. SubSystem block "BCM_HO_SEBU"

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant/BCM_HO_Controller

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	3
Decision	NA	100% (6/6) decision outcomes
Execution	NA	100% (4/4) objective outcomes

Full Coverage

Model Object	Metric
Saturate block "Saturation"	Decision, Execution
Switch block "Switch"	Decision, Execution
Constant block "Constant1"	Execution
Constant block "Constant2"	Execution

9. SubSystem block "BCM_Sunroof"

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant

Child Systems: Function_Sun

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	10
Condition	NA	100% (4/4) condition outcomes
Decision	NA	100% (15/15) decision outcomes
MCDC	NA	100% (2/2) conditions reversed the outcome

10. MATLAB Function "Function_Sun"

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant/BCM_Sunroof

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	1	10
Condition	NA	100% (4/4) condition outcomes
Decision	NA	100% (15/15) decision outcomes
MCDC	NA	100% (2/2) conditions reversed the outcome

Full Coverage

Model Object	Metric
MATLAB Function "fcn"	Condition, Decision, MCDC

11. SubSystem block "BCM_Wiper_Control_System"

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	5
Decision	NA	100% (6/6) decision outcomes
Execution	NA	100% (7/7) objective outcomes

Full Coverage

Model Object	Metric
MultiPortSwitch block "Multiport Switch for input conditions"	Decision, Execution
Constant block "Constant"	Execution
Constant block "High_Speed"	Execution
Constant block "Low_Speed"	Execution
Constant block "Medium_Speed"	Execution
Constant block "Mist"	Execution
Constant block "Off"	Execution

12. SubSystem block "Subsystem"

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant
Child Systems: AC_control_chart

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	35
Condition	NA	100% ((30+4)/34) condition outcomes
Decision	NA	100% ((40+3)/43) decision outcomes
MCDC	NA	100% ((13+4)/17) conditions reversed the outcome

13. SubSystem block "AC_control_chart"

Justified J2.

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant/Subsystem
Child Systems: BCM_Controller_and_Plant/Subsystem/AC_control_chart

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	1	35
Condition	NA	100% ((30+4)/34) condition outcomes
Decision	NA	100% ((40+3)/43) decision outcomes
MCDC	NA	100% ((13+4)/17) conditions reversed the outcome

14. Chart "BCM_Controller_and_Plant/Subsystem/AC_co..."

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant/Subsystem/AC_control_chart
Child Systems: AC_ON, Auto_cond

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	6	34
Condition	NA	100% ((30+4)/34) condition outcomes
Decision	100% (7/7) decision outcomes	100% ((40+3)/43) decision outcomes
MCDC	NA	100% ((13+4)/17) conditions reversed the outcome

Decisions analyzed

Substate executed	100%
State "AC_ON"	124/888 T1
State "Auto_cond"	68/888 T1
State "Compressor_cond"	48/888 T1
State "Compressor_cond1"	32/888 T1
State "HVAC_OFF"	584/888 T1
State "Recirculation"	12/888 T1

State "Recirculation1"	20/888 T1

Transition "[AutoRead==1|| head ==1 || head_leg ==1 ...]" from "AC_ON" to "Auto_cond"

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant/Subsystem/AC_control_chart

Metric	Coverage
Cyclomatic Complexity	5
Condition	100% ((8+2)/10) condition outcomes
Decision	100% (2/2) decision outcomes
MCDC	100% ((3+2)/5) conditions reversed the outcome

```
1  [AutoRead==1|| head ==1 || head_leg ==1 || leg == 1 || Defog_leg == 1]
```

#1: [AutoRead==1|| head ==1 || head_leg ==1 || leg == 1 || Defog_leg == 1]

Decisions analyzed

AutoRead==1|| head ==1 || head_leg ==1 || leg == 1 || Defog_leg == 1	100%
false	28/64 T1
true	36/64 T1

Conditions analyzed

Description	True	False
AutoRead==1	16 T1	48 T1
head ==1	16 T1	32 T1
head_leg ==1	-	32 T1
leg == 1	4 T1	28 T1
Defog_leg == 1	-	28 T1

MC/DC analysis (combinations in parentheses did not occur)

Decision/Condition	True Out	False Out
AutoRead==1|| head ==1 || head_leg ==1 || leg == 1 || Defog_leg == 1		
AutoRead==1	**T**xxxx T1	**F**FFFF T1
head ==1	F**T**xxx T1	F**F**FFF T1
head_leg ==1	-	
leg == 1	FFF**T**x	FFF**F**F

	T1	T1
Defog_leg == 1	-	

Transition "[blower==1 && Re_read==1]" from "AC_ON" to "Recirculation"

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant/Subsystem/AC_control_chart

Metric	Coverage
Cyclomatic Complexity	2
Condition	100% ((3+1)/4) condition outcomes
Decision	100% (2/2) decision outcomes
MCDC	100% ((1+1)/2) conditions reversed the outcome

```
1  [blower==1 && Re_read==1]
```

#1: [blower==1 && Re_read==1]

Decisions analyzed

blower==1 && Re_read==1	100%
false	20/28 T1
true	8/28 T1

Conditions analyzed

Description	True	False
blower==1	28 T1	-
Re_read==1	8 T1	20 T1

MC/DC analysis (combinations in parentheses did not occur)

Decision/Condition	True Out	False Out
blower==1 && Re_read==1		
blower==1	-	
Re_read==1	**T**T T1	**F**T T1

Transition "[blower==1&&Re_read==0]" from "AC_ON" to "Recirculation1"

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant/Subsystem/AC_control_chart

Metric	Coverage
Cyclomatic Complexity	2
Condition	100% ((3+1)/4) condition outcomes
Decision	100% (2/2) decision outcomes
MCDC	100% ((1+1)/2) conditions reversed the outcome

1 [blower==1&&Re_read==0]

#1: [blower==1&&Re_read==0]

Decisions analyzed

blower==1&&Re_read==0	100%
false	8/20 T1
true	12/20 T1

Conditions analyzed

Description	True	False
blower==1	20 T1	-
Re_read==0	12 T1	8 T1

MC/DC analysis (combinations in parentheses did not occur)

Decision/Condition	True Out	False Out
blower==1&&Re_read==0		
blower==1	-	
Re_read==0	TT T1	TF T1

Full Coverage

Model Object	Metric
Transition "[Engine == 1 && AC ==1]" from "HVAC_OFF" to "AC_ON"	Condition, Decision, MCDC
Transition "[Engine ==0 || AC == 0]" from "AC_ON" to "HVAC_OFF"	Condition, Decision, MCDC
Transition "[User_temp < Sensor_read && compressor =..." from "AC_ON" to "Compressor_cond"	Condition, Decision, MCDC
Transition "after(0.005,usec)" from "Compressor_cond" to "AC_ON"	Decision
Transition "[User_temp >= Sensor_read && compressor ..." from "AC_ON" to "Compressor_cond1"	Condition, Decision, MCDC
Transition "after(0.005,usec)" from "Compressor_cond1" to "AC_ON"	Decision
Transition "after(0.005,usec)" from "Auto_cond" to "AC_ON"	Decision
Transition "after(0.005,usec)" from "Recirculation" to "AC_ON"	Decision

Transition "after(0.5,usec)" from "Recirculation1" to "AC_ON"	Decision

15. State "AC_ON"

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant/Subsystem/AC_control_chart

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	2
Decision	NA	100% ((3+1)/4) decision outcomes

Transition "[Speed_Read==3]" from Junction #15 to Junction #16

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant/Subsystem/AC_control_chart.AC_ON

Metric	Coverage
Cyclomatic Complexity	1
Decision	100% ((1+1)/2) decision outcomes

```
1  [Speed_Read==3]
```

#1: [Speed_Read==3]

Decisions analyzed

Speed_Read==3	100%
false	112/112 T1
true	-

Full Coverage

Model Object	Metric
Transition "[Speed_Read==2]" from Junction #13 to Junction #14	Decision

16. State "Auto_cond"

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant/Subsystem/AC_control_chart

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	4
Decision	NA	100% ((6+2)/8) decision outcomes

Transition "[head_leg == 1]" from Junction #4 to Junction #5

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant/Subsystem/AC_control_chart.Auto_cond

Metric	Coverage
Cyclomatic Complexity	1
Decision	100% ((1+1)/2) decision outcomes

```
1  [head_leg == 1]
```

#1: [head_leg == 1]

Decisions analyzed

head_leg == 1	100%
false	16/16 T1
true	-

Transition "[Defog_leg == 1]" from Junction #6 to Junction #12

Justify or Exclude

Parent: Automated_BCM_Integrated_2020b/BCM_Controller_and_Plant/Subsystem/AC_control_chart.Auto_cond

Metric	Coverage
Cyclomatic Complexity	1
Decision	100% ((1+1)/2) decision outcomes

```
1  [Defog_leg == 1]
```

#1: [Defog_leg == 1]

Decisions analyzed

Defog_leg == 1	100%
false	16/16 T1
true	-

Full Coverage

Model Object	Metric
Transition "[head == 1]" from Junction #0 to Junction #1	Decision
Transition "[leg == 1]" from Junction #2 to Junction #3	Decision