
Huang and Co.

Boolean Expression Evaluator

Test Case

Version 1.0

Boolean Expression Evaluator	Version: 1.0
Test Case	Date: 27/04/24
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Revision History

Date	Version	Description	Author
27/04/24	1.0	Completed tasks and reviewed	Andrew Huang, Elizabeth Miller, Hunter Long, Katharine Swann, Keaton Xu

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Test Case

1. Purpose

This Test Case Specification document for the Boolean expression evaluator (B.E.E.) lists a table of black box test cases to test its functionality. The functional areas of the evaluator that the test cases cover, as well as the results of the test cases, are recorded to determine what areas of the evaluator need to be changed.

Test Case ID	Test Case Description	Test Input	Expected Results	Actual Results	Pass/Fail Status
TC-01	Sample Expression 1	$(T \mid F) \$ F$	True	True	Pass ▾
TC-02	Sample Expression 2	$!(T \& T)$	False	False	Pass ▾
TC-03	Sample Expression 3	$(F @ T) \mid (T @ F)$	True	True	Pass ▾
TC-04	Sample Expression 4	$(T \$ T) \& F$	False	False	Pass ▾
TC-05	Sample Expression 5	$! F \mid ! T$	True	True	Pass ▾
TC-06	Sample Expression 6	$(((((T \mid F) \& F) \mid (T \& (T \mid F))) @ (T @ T)) \$ (! (T \mid F)))$	True	True	Pass ▾
TC-07	Sample Expression 7	$((F \$ ((T \mid F) \& (F @ (T \mid F)))) \mid (T \$ (T \& F)))$	False	False	Pass ▾
TC-08	Sample Expression 8	$(((! (T \$ F)) \& (T @ T)) \mid ((F \mid T) \& (T \$ T)))$	False	False	Pass ▾
TC-09	Sample Expression 9	$((T @ T) \$ (F @ T)) \mid ((!T) \& (T \mid (!T)))$	True	True	Pass ▾
TC-10	Sample Expression 10	$((F @ T) \$ (T \mid (F \& F))) \& (T \& (T @ (!T)))$	False	False	Pass ▾
TC-11	Missing operand	$! \& T$	Invalid Expression	Invalid Expression	Pass ▾
TC-12	Unknown operator	$T ? T$	Invalid Expression	Invalid Expression	Pass ▾
TC-13	Mismatched parentheses	$(T \mid) \text{ False}$	Invalid Expression	Invalid Expression	Pass ▾
TC-14	Circular logic	$T = !(T \& T)$	Invalid	Invalid	Pass ▾

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			Expression	Expression	
TC-15	Empty expression	blank*	Invalid Expression	Invalid Expression	Pass ▾
TC-16	Double operator	T && & F	Invalid Expression	Invalid Expression	Pass ▾
TC-17	Missing truth value	X Y	Invalid Expression	Invalid Expression	Pass ▾
TC-18	Inconsistent characters	True F	Invalid Expression	Invalid Expression	Pass ▾
TC-19	Operator after operand	True!	Invalid Expression	Invalid Expression	Pass ▾
TC-20	Invalid characters	a & b	Invalid Expression	Invalid Expression	Pass ▾
TC-21	Basic AND gate evaluation	T & F	False	False	Pass ▾
TC-22	Basic NOT gate evaluation	!T	False	False	Pass ▾
TC-23	Basic OR gate evaluation	T F	True	True	Pass ▾
TC-24	Basic NAND gate evaluation	T@F	True	True	Pass ▾
TC-25	Basic XOR gate evaluation	T\$F	True	True	Pass ▾
TC-26	single operand in parentheses	(T)	True	True	Pass ▾
TC-27	NOT gate evaluation of single operand in parentheses	!(T)	False	False	Pass ▾
TC-28	Double NOT gate evaluation of single operand	!!T	True	True	Pass ▾
TC-29	Expressions with NOT gate evaluation between operator and	T & !F	True	True	Pass ▾

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	operand				
TC-30	Expression with a single T operand	$(T \mid T) \& T$	True	True	Pass ▾
TC-31	Expression with a single F operand	$(F \mid F) \& F$	False	False	Pass ▾
TC-32	Double parentheses	$((T \& F))$	False	False	Pass ▾
TC-33	Two expressions	$(T \& F) \mid (F \mid T)$	True	True	Pass ▾
TC-34	Nested parentheses expression version 1	$((T @ F)) \mid (F \$ F)$	True	True	Pass ▾
TC-35	Nested parentheses expression version 2	$((T \& F) \mid T)$	True	True	Pass ▾
TC-36	Using other operands	$X = T$ $Y = F$ $X \mid Y$	True	True	Pass ▾
TC-37	Excessive spaces	$T \quad \& \quad F$	False	False	Pass ▾
TC-38	Incorrect use of other operands	$X = T$ $X = F$ $X \mid X$	Invalid Expression	Invalid Expression	Pass ▾
TC-39	Using other operands with character length > 1	$X1 = T$ $X2 = F$ $X1 \mid X2$	Invalid Expression	Invalid Expression	Pass ▾
TC-40	Empty parentheses	$()$	Invalid Expression	Invalid Expression	Pass ▾
TC-41	Operands with no operators	$T \ T \ F$	Invalid Expression	Invalid Expression	Pass ▾
TC-42	Incomplete expression	$T \mid$	Invalid Expression	Invalid Expression	Pass ▾
TC-43	Missing close parenthesis	$(T \& F$	Invalid Expression	Invalid Expression	Pass ▾

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TC-44	Missing open parenthesis	T & F)	Invalid Expression	Invalid Expression	Pass ▾
TC-45	Lack of sufficient parentheses	T F T	Invalid Expression	Invalid Expression	Pass ▾
TC-46	Uninitialized character	H	Invalid Expression	Invalid Expression	Pass ▾

Test Cases TC-01 - TC-20 are the given sample cases from the Project Description and all below are additional self-made cases. A few of the additional cases are general base cases (TC-21 - TC-25).

2. **Test case identifier**

Reference the above table.

3. **Test item**

Reference the above table.

4. **Input specifications**

Reference the above table.

5. **Output specifications**

Reference the above table.

6. **Environmental needs**

6.1.1 *Hardware*

N/A

6.1.2 *Software*

N/A

6.1.3 *Other*

N/A

7. **Special procedural requirements**

N/A

8. **Intercase dependencies**

N/A