

## 1. CWE IDs

Here is the list and mapping of 44 standardized CWE identifiers derived from the 9 Toyota ITC defect categories.

### 1.1. List of CWE IDs

No.	CWE ID	Title
1	CWE-1335	Incorrect Bitwise Shift Direction
2	CWE-122	Heap-based Buffer Overflow
3	CWE-786	Access of Memory Location Before Start of Buffer
4	CWE-480	Use of Incorrect Operator
5	CWE-570	Expression is Always False
6	CWE-571	Expression is Always True
7	CWE-681	Incorrect Conversion between Numeric Types
8	CWE-190	Integer Overflow or Wraparound
9	CWE-191	Integer Underflow (Wrap or Wraparound)
10	CWE-561	Dead Code
11	CWE-833	Deadlock
12	CWE-463	Deletion of Data Structure Sentinel
13	CWE-415	Double Free
14	CWE-667	Improper Locking
15	CWE-675	Duplicate Operations on Resource
16	CWE-835	Loop with Unreachable Exit Condition (Infinite Loop)
17	CWE-590	Free of Memory not on the Heap
18	CWE-476	NULL Pointer Dereference
19	CWE-843	Access of Resource Using Incompatible Type
20	CWE-252	Unchecked Return Value
21	CWE-703	Improper Check or Handling of Exceptional Conditions
22	CWE-484	Omitted Break Statement in Switch
23	CWE-563	Assignment to Variable without Use
24	CWE-416	Use After Free
25	CWE-131	Incorrect Calculation of Buffer Size
26	CWE-764	Multiple Locks of a Critical Resource
27	CWE-121	Stack-based Buffer Overflow
28	CWE-825	Expired Pointer Dereference
29	CWE-401	Missing Release of Memory after Effective Lifetime
30	CWE-393	Return of Wrong Status Code
31	CWE-824	Access of Uninitialized Pointer
32	CWE-1260	Improper Handling of Overlapping Memory
33	CWE-189	Numeric Errors
34	CWE-469	Use of Pointer Subtraction to Determine Size
35	CWE-465	Pointer Issues
36	CWE-362	Concurrent Execution using Shared Resource with Improper Synchronization
37	CWE-398	Indicator of Poor Code Quality
38	CWE-562	Return of Stack Variable Address
39	CWE-196	Unsigned to Signed Conversion Error
40	CWE-908	Use of Uninitialized Resource
41	CWE-457	Use of Uninitialized Variable
42	CWE-765	Multiple Unlocks of a Critical Resource
43	CWE-628	Function Call with Incorrectly Specified Arguments
44	CWE-369	Divide By Zero

Table 1. CWE IDs found in the dataset

## 1.2. Mapping of CWE IDs

<b>Toyota ITC Defect Type</b>	<b>CWE IDs</b>
Concurrency defects	CWE-190, CWE-362, CWE-667, CWE-675, CWE-764, CWE-765, CWE-833, CWE-843
Dynamic memory defects	CWE-122, CWE-1260, CWE-131, CWE-463, CWE-786
Inappropriate code	CWE-252, CWE-398, CWE-484, CWE-561, CWE-563, CWE-570, CWE-571, CWE-703
Misc defects	CWE-393, CWE-457, CWE-563, CWE-835, CWE-843
Numerical defects	CWE-1335, CWE-189, CWE-190, CWE-191, CWE-196, CWE-369, CWE-476, CWE-681
Pointer related defects	CWE-465, CWE-469, CWE-476, CWE-480, CWE-628, CWE-824, CWE-843
Resource management defects	CWE-121, CWE-401, CWE-415, CWE-416, CWE-476, CWE-561, CWE-562, CWE-590, CWE-825, CWE-835, CWE-908
Stack related defects	CWE-121, CWE-416, CWE-786
Static memory defects	CWE-121, CWE-786

*Table 2.* Mapping of Toyota ITC Defect Types to CWE IDs.