6.2 Testing Levels

A software testing strategy provides a road map for the software developer. Testing begins at the module level and works outward towards the integration of the entire computer based system. Different testing techniques are used. The commonly used testing strategies are Unit Testing, Integration Testing and System Testing.

6.2.1 Unit Testing

It is a testing method where individual units of code, set of one or more modules together with associated control data are tested to determine if they are fit to use. Test cases are defined to perform unit testing. The following are a few test cases considered-

Test Case 1: When window size (N) is lesser than the given threshold

This test case is checked by varying the value of N from its threshold value to a value significantly low. The following table summarizes the result of the test case.

Threshold Value (value of N)	**Input** (value of N)	**Expected Output** (in terms of accuracy)	**Observed Output** (in terms of accuracy)
100	40	<100%	62.5%

Table 6.1 Test Case 1

Result:The observed output is low in a practical perspective but numerically consistent.

Test Case 2: When window size (N) is greater than the given threshold

This test case is checked by varying the value of N from its threshold value to a value significantly high. The following table summarizes the result of the test case.

Threshold Value (value of N)	**Input** (value of N)	**Expected Output** (in terms of accuracy)	**Observed Output** (in terms of accuracy)
100	225	100%	100%

Table 6.2 Test Case 2

Result: The observed output matches with the expected output.

Test Case 3: When number of bands (K) is lesser than the given threshold

This test case is checked by varying the value of K from its threshold value to a value significantly low. The following table summarizes the result of the test case.

Threshold Value (value of K)	**Input** (value of K)	**Expected Output** (in terms of accuracy)	**Observed Output** (in terms of accuracy)
40	5	<100%	53.29%

Table 6.3 Test Case 3

Result:The observed output is low in a practical perspective but numerically consistent.

Test Case 4: When number of bands (K) is lesser than the given threshold

This test case is checked by varying the value of K from its threshold value to a value significantly high. The following table summarizes the result of the test case.

Threshold Value (value of K)	**Input** (value of K)	**Expected Output** (in terms of accuracy)	**Observed Output** (in terms of accuracy)
40	80	100%	100%

Table 6.4 Test Case 4

Result: The observed output matches with the expected output.

Test Case 5: When error proportion rate (t) is lesser than the given threshold

This test case is checked by varying the value of t from its threshold value to a value significantly low. The following table summarizes the result of the test case.

Threshold Value (value of t)	**Input** (value of t)	**Expected Output** (in terms of False Alarm Rate)	**Observed Output** (in terms of False Alarm Rate)
0.1	0.088	0%	1.61%

Table 6.5 Test Case 5

Result: The observed output matches closely with the expected output and acceptable.

Test Case 6: When error proportion rate (t) is greater than the given threshold

This test case is checked by varying the value of t from its threshold value to a value significantly high. The following table summarizes the result of the test case.

Threshold Value (value of t)	**Input** (value of t)	**Expected Output** (in terms of False Alarm Rate)	**Observed Output** (in terms of False Alarm Rate)
0.1	0.13	0%	0.92%

Table 6.6 Test Case 6

Result: The observed output matches closely with the expected output and acceptable.