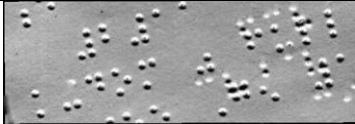
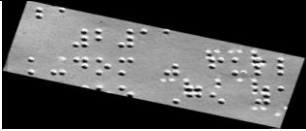
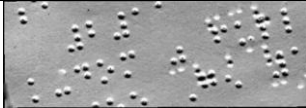

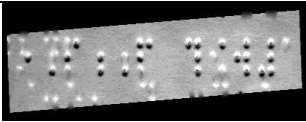
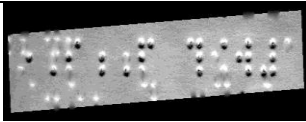

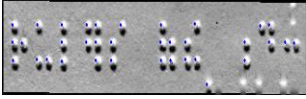
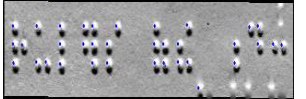



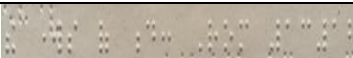






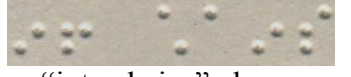










APPENDIX C





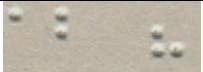
Test Cases








	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
1.	Negative		 <p>Skewed more than 5.5 degrees counterclockwise</p>	 <p>De-skewed Image</p>	 <p>Image is still skewed</p>	An angle more than 5.5 degrees will not be extracted
2.	Positive		 <p>Skewed 3.14 degrees clockwise</p>	 <p>De-skewed Image</p>	 <p>De-skewed Image</p>	
3.	Positive		 <p>Skewed 0.05 degrees counterclockwise</p>	 <p>Depressions are filtered</p>	 <p>Depressions are filtered</p>	
4.	Positive	“rulers”	 <p>“rulers” word</p>	“rulers”	“rulers”	








	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
5.	Positive	“ofthe”	 “ofthe” phrase	“ofthe”	“ofthe”	
6.	Positive	“do”	 “d” character	“do”	“do”	
7.	Negative	“the works of d”	 low resolution input	“the works of d”	n/a	Resolution is under 200dpi
8.	Positive	“d hath”	 “d hath” phrase	“d hath”	“d hath”	
9.	Positive	“blinded”	 “blinded” word Skewed 0.06 degrees clockwise	“blinded”	“blinded”	
10.	Positive	“rulers ofthe”	 phrase skewed 0.40 degrees counterclockwise	“rulers ofthe”	“rulers ofthe”	







	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
11.	Positive	“out of d into”	 “out of d into” phrase skewed 0.05 degrees counterclockwise	“out of d into”	“out of d into”	
12.	Positive	“and walk in”	 “and walk in” phrase skewed 0.71 degrees clockwise	“and walk in”	“and walk in”	
13.	Positive	“hath light with”	 “hath light with” phrase skewed 0.19 degrees counterclockwise	“hath light with” phrase	“hath light with” phrase	
14.	Positive	“into chains”	 “into chains” phrase skewed 0.77 degrees counterclockwise	“into chains”	“into chains”	
15.	Positive	“is no”	 “is no” phrase skewed 0.66 degrees counterclockwise	“is no”	“is no”	
16.	Positive	“night”	 “night” word skewed 0.83 degrees counterclockwise	“night”	“night”	







	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
17.	Positive	“shine out”	 “shine out” phrase skewed 0.91 degrees counterclockwise	“shine out”	“shine out”	
18.	Positive	“the power”	 “the power” phrase skewed 0.73 degrees counterclockwise	“the power”	“the power”	
19.	Positive	“the d is”	 “the d is” skewed 4.45 degrees clockwise	“the d is”	“the d is”	
20.	Positive	No word	 Back Side Dots skewed 3.75 degrees clockwise	No Character Detected	No Character Detected	
21.	Positive	“of”	 “of” word skewed 4.95 degrees clockwise	“of”	“of”	
22.	Positive	“out d”	 “out d” phrase skewed 5.27 degrees clockwise	“out d”	“out d”	






	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
23.	Positive	“start here”	 “start here” phrase skewed 0.64 degrees counterclockwise	“start here”	“start here”	
24.	Positive	“no”	 “no” word skewed 0.64 degrees counterclockwise	“no”	“no”	
25.	Positive	“in him is”	 “in him is” phrase skewed 0.26 degrees clockwise	“in him is”	“in him is”	
26.	Positive	“because”	 “because” word skewed 1.07 degrees clockwise	“because”	“because”	
27.	Positive	“about his”	 “about his” phrase skewed 0.26 degrees counterclockwise	“about his”	“about his”	


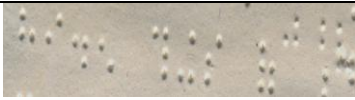
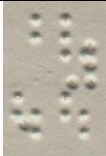

	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
28.	Positive	“before”	 “before” word skewed 3.70 degrees counterclockwise	“before”	“before”	
29.	Positive	“below”	 “below” word skewed 1.08 degrees clockwise	“below”	“below”	
30.	Positive	“beneath”	 “beneath” word skewed 1.78 degrees clockwise	“beneath”	“beneath”	
31.	Positive	“beside”	 “beside” word skewed 0.9 degrees counterclockwise	“beside”	“beside”	
32.	Positive	“blind”	 “blind” word skewed 0.86 degrees counterclockwise	“blind”	“blind”	
33.	Positive	“cannot”	 “cannot” word skewed 0.4 degrees clockwise	“cannot”	“cannot”	
34.	Positive	“character”	 “character” word skewed 0.49 degrees clockwise	“character”	“character”	


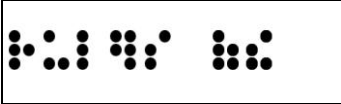
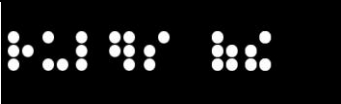

	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
35.	Positive	“children”	 “children” word skewed 2.17 degrees clockwise	“children”	“children”	
36.	Positive	“deceive”	 “deceive” word skewed 0.31 degrees clockwise	“deceive”	“deceive”	
37.	Positive	“declare”	 “declare” word skewed 2.33 degrees clockwise	“declare”	“declare”	
38.	Positive	“declaring”	 “declaring” word skewed 0.46 degrees clockwise	“declaring”	“declaring”	
39.	Positive	“first”	 “first” word skewed 1.37 degrees clockwise	“first”	“first”	
40.	Positive	“friend”	 “friend” word skewed 2.09 degrees clockwise	“friend”	“friend”	
41.	Positive	“good night”	 “good night” word skewed 0.49 degrees clockwise	“good night”	“good night”	





	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
42.	Positive	“great”	 “great” word skewed 1.07 degrees clockwise	“great”	“great”	
43.	Positive	“had”	 “had” word skewed 1.76 degrees counterclockwise	“had”	“had”	
44.	Positive	“jumps over”	 “jumps over” phrase not skewed	“jumps over”	“jumps over”	
45.	Positive	“must have”	 “must have” phrase skewed 0.89 degrees counterclockwise	“must have”	“must have”	
46.	Positive	“the quick brown”	 “the quick brown” phrase not skewed	“the quick brown”	“the quick brown”	
47.	Positive	“the lazy dog”	 “the lazy dog” phrase not skewed	“lazy dog”	“lazy dog”	





	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
48.	Positive	“herself”	 “herself” word skewed 0.55 degrees counterclockwise	“herself”	“herself”	
49.	Positive	“immediate”	 “immediate” word not skewed	“immediate”	“immediate”	
50.	Positive	“himself”	 “himself” word skewed 1.57 degrees counterclockwise	“himself”	“himself”	
51.	Positive	“itself”	 “itself” word skewed 2.42 degrees counterclockwise	“itself”	“itself”	
52.	Positive	“letter”	 “letter” word skewed 3.05 degrees clockwise	“letter”	“letter”	
53.	Positive	“lord”	 “lord” word skewed 4.3 degrees counterclockwise	“lord”	“lord”	





	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
54.	Positive	“little”	 “little” word skewed 3.20 degrees counterclockwise	“little”	“little”	
55.	Positive	“just once”	 “just once” phrase skewed 3.7 degrees counterclockwise	“just once”	“just once”	
56.	Positive	“let there be light”	 “let there be light” phrase skewed 1.83 degrees clockwise	“let there be light”	“let there be light”	
57.	Positive	No word	 Blank input	Insufficient dots	Insufficient dots	
58.	Positive	“kingdom was full of”	 “kingdom was full of” phrase skewed 0.12 degrees counterclockwise	“kingdom was full of”	“kingdom was full of”	





	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
59.	Negative	“how are you?”	 <p>“how are you?” phrase skewed 3.7 degrees counterclockwise</p>	“how are you?”	“how are yhis”	The system cannot process special character/s or signs. Question mark is a special character which is beyond the scope. Also the question mark has the same binary code as the “his” contraction.
60.	Negative	“hidden things of d”	 <p>“hidden things of d” phrase skewed 4.2 degrees clockwise</p>	“hidden things of d”	“hidden things of ever”	In the rightmost part, the depressions merged with the protrusion and combined as 1 dot.
61.	Positive	“just”	 <p>“just” word cut vertically and skewed 0.26 degrees counterclockwise</p>	“just”	“just”	
62.	Positive	“accessories”	 <p>“accessories” word not skewed</p>	“accessories”	“accessories”	


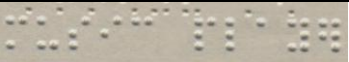


	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
63.	Negative	“click icon”	 <p>“click icon” phrase skewed 1.9 degrees counterclockwise</p>	“click icon”	“cbick icon”	In the lowest left part, the depressions merged with the protrusion. In effect, the protrusion was also erased.
64.	Negative	“rulers of the”	 <p>“rulers of the” phrase not skewed</p>	“Insufficient Braille dots”	“No Dataowble ofa No Datak”	The input is not a scanned Braille document. It is an invalid input. There was a problem in extracting the centroids.
65.	Negative	“rulers of the”	 <p>“rulers of the” phrase not skewed</p>	“Insufficient Braille dots”	“Insufficient Braille dots”	The equivalent translation of the Braille characters in the image is “rulers of the”. However, this was not cut from a scanned Braille document.
66.	Positive	“desktop”	 <p>“desktop” word skewed 1.30 degrees clockwise</p>	“desktop”	“desktop”	





	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
67.	Positive	“enter your name”	 “enter your name” phrase skewed 1.28 degrees clockwise	“enter your name”	“enter your name”	
68.	Positive	“installation successful”	 “installation successful” phrase not skewed	“installation successful”	“installation successful”	
69.	Positive	“internet”	 “internet” word skewed 0.17 degrees counterclockwise	“internet”	“internet”	
70.	Positive	“keyboard”	 “keyboard” word skewed 1.7 degrees clockwise	“keyboard”	“keyboard”	





	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
71.	Positive	“program files”	 <p>“program files” phrase skewed 1.5 degrees clockwise</p>	“program files”	“program files”	
72.	Positive	“mouse over”	 <p>“mouse over” phrase skewed 3.17 degrees counterclockwise</p>	“mouse over”	“mouse over”	
73.	Positive	“right click”	 <p>“right click” phrase skewed 0.8 degrees clockwise</p>	“right click”	“right click”	
74.	Positive	“shut down”	 <p>“shut down” phrase skewed 0.33 degrees clockwise</p>	“shut down”	“shut down”	





	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
75.	Positive	“windows xp”	 “windows xp” phrase skewed 2.9 degrees counterclockwise	“windows xp”	“windows xp”	
76.	Positive	“connect to”	 “connect to” phrase skewed 2.00 degrees clockwise	“connect to”	“connect to”	
77.	Positive	“great knowledge”	 “great knowledge” phrase skewed 2.05 degrees clockwise	“great knowledge”	“great knowledge”	
78.	Positive	“ourselves”	 “ourselves” word skewed 4.85 degrees counterclockwise	“ourselves”	“ourselves”	



	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
79.	Positive	“paid people”	 <p>“paid people” phrase skewed 0.45 degrees counterclockwise</p>	“paid people”	“paid people”	
80.	Positive	“perceive”	 <p>“perceive” word skewed 0.99 degrees clockwise</p>	“perceive”	“perceive”	
81.	Positive	“world tonight”	 <p>“world tonight” phrase skewed 4.2 degrees clockwise</p>	“world tonight”	“world tonight”	
82.	Negative	“be”	 <p>“be” word not skewed</p>	“be”	“Insufficient Braille dots”	No dots exist in the second column and the first row

	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
83.	Positive	“good news”	 <p>“good news” word skewed 2.17 degrees counterclockwise</p>	“good news”	“good news”	
84.	Positive	“music player”	 <p>“music player” phrase skewed 0.51 degrees clockwise</p>	“music player”	“music player”	
85.	Positive	“controller”	 <p>“controller” word skewed 1.99 degrees counterclockwise</p>	“controller”	“controller”	
86.	Positive	“such spirit”	 <p>“such spirit” phrase skewed 1.77 degrees counterclockwise</p>	“such spirit”	“such spirit”	

	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
87.	Positive	“so young”	 “so young” phrase skewed 1.77 degrees counterclockwise	“so young”	“so young”	
88.	Positive	“counting”	 “counting” word skewed 1.38 degrees counterclockwise	“counting”	“counting”	
89.	Positive	“press enter”	 “press enter” phrase skewed 0.29 degrees counterclockwise	“press enter”	“press enter”	
90.	Positive	“network”	 “network” word skewed 0.84 degrees counterclockwise	“network”	“network”	

	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
91.	Negative	“23”	 “23” number skewed 0.06 degrees counterclockwise	“23”	“blebc”	Numeric Braille is not part of the character database.
92.	Negative	“3:16”	 “3:16” phrase skewed 0.38 degrees counterclockwise	“3:16”	“bleccble after”	Numeric Braille and special characters are not part of the character database.
93.	Negative	“John”	 “John” word skewed 0.1 degrees clockwise	“John”	“No Datajohn”	Only lower case Braille characters are covered in the study. The letter sign before “j” is causing the mismatch.
94.	Positive	“free wind”	 “free wind” phrase skewed 0.31 degrees clockwise	“free wind”	“free wind”	

	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
95.	Positive	“for children”	 “for children” phrase skewed 0.39 degrees clockwise	“for children”	“for children”	
96.	Positive	“angels”	 “angels” word skewed 0.53 degrees clockwise	“angels”	“angels”	
97.	Positive	“demons”	 “demons” word skewed 0.29 degrees counterclockwise	“demons”	“demons”	
98.	Positive	“escape”	 “escape” word skewed 1.58 degrees counterclockwise	“escape”	“escape”	

	Positive/ Negative	Word/Phrase	Input	Expected Output	Actual Output	Reason (if negative)
99.	Positive	“brother”	 “brother” word skewed 0.22 degrees clockwise	“brother”	“brother”	
100.	Positive	“water”	 “water” word skewed 0.84 degrees counterclockwise	“water”	“water”	

A.4
Test Cases