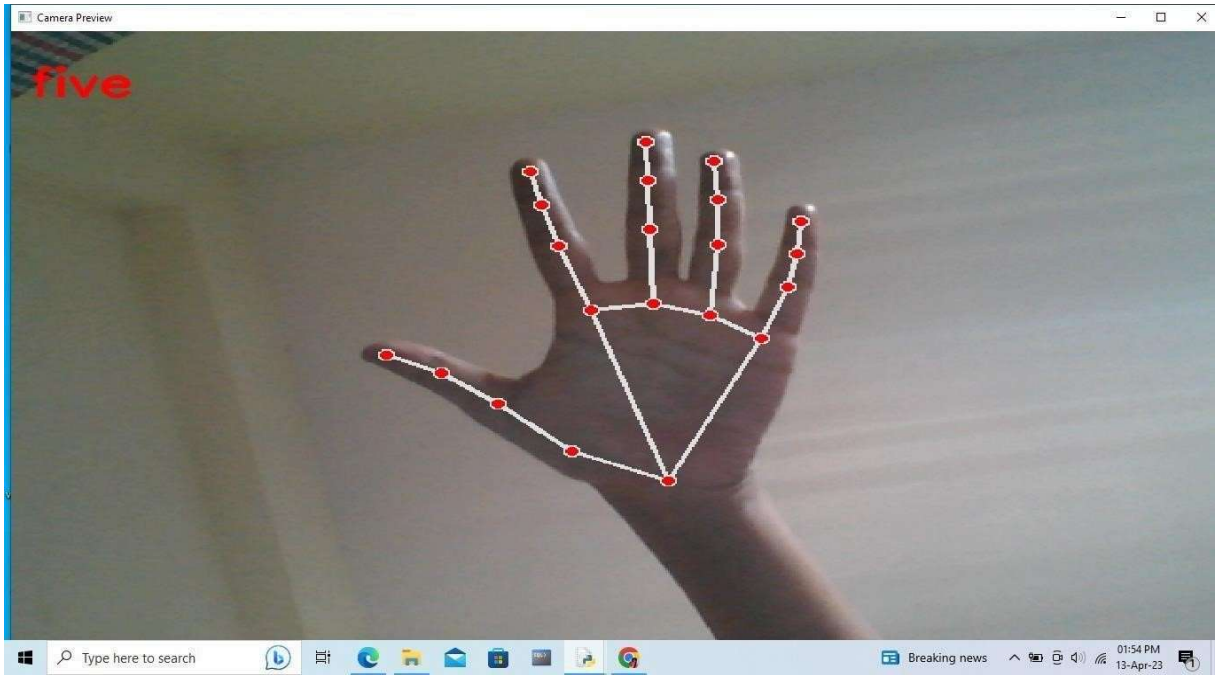


Fig. 6.1.1: Test Case 1

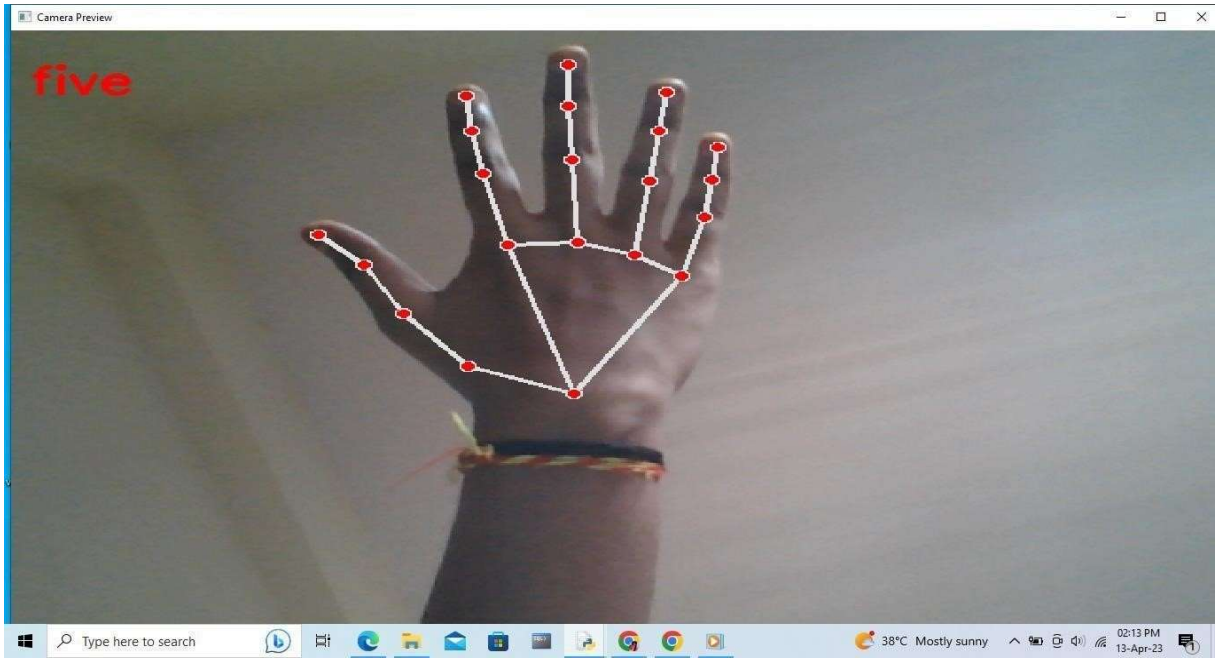


Fig. 6.1.2: Test Case 2

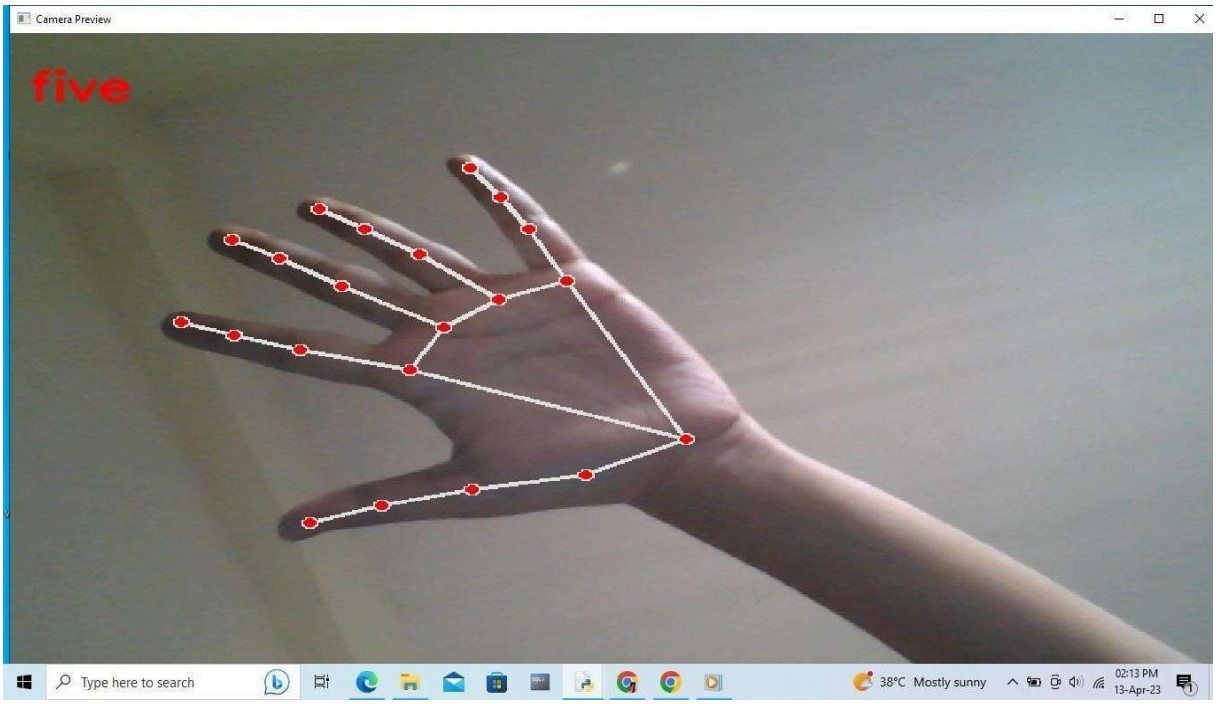


Fig.6.1.3: Test Case 3

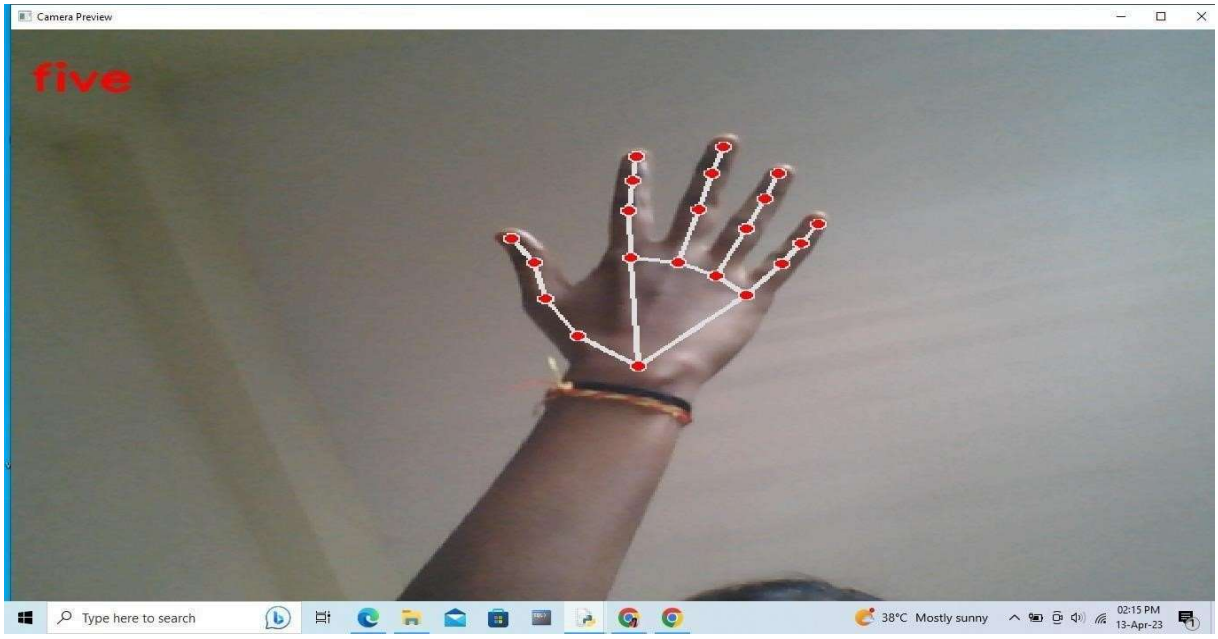
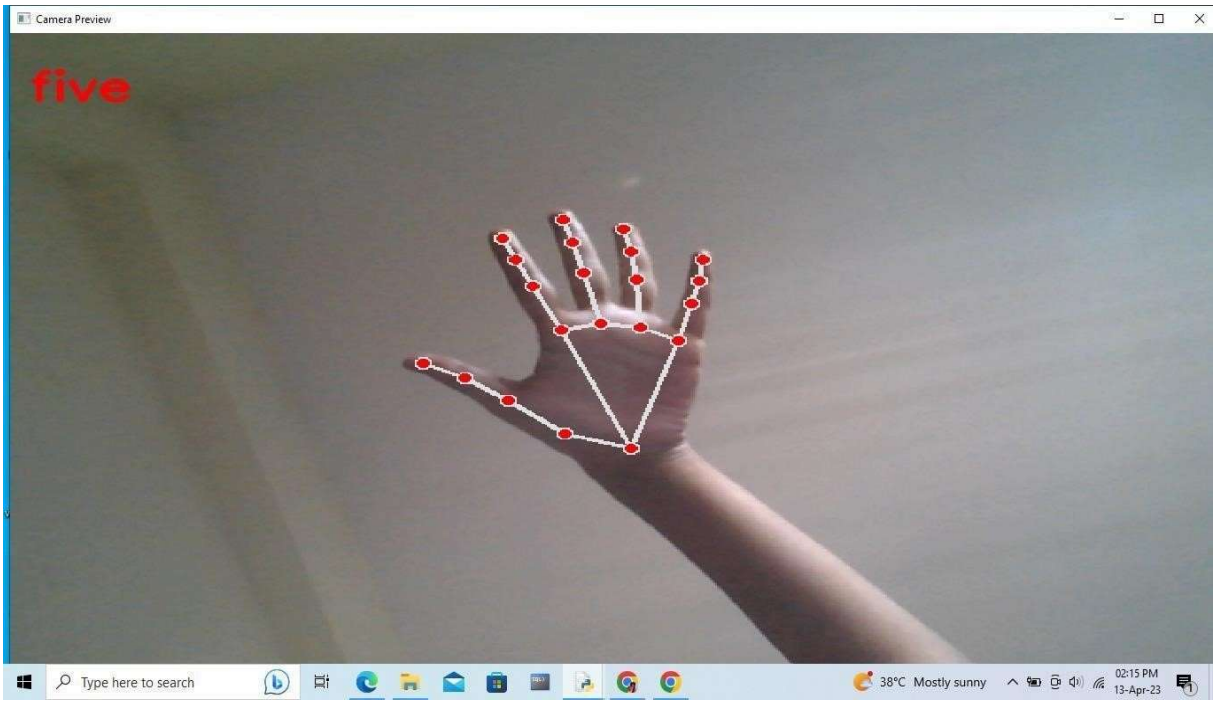


Fig. 6.1.4: Test Case 4



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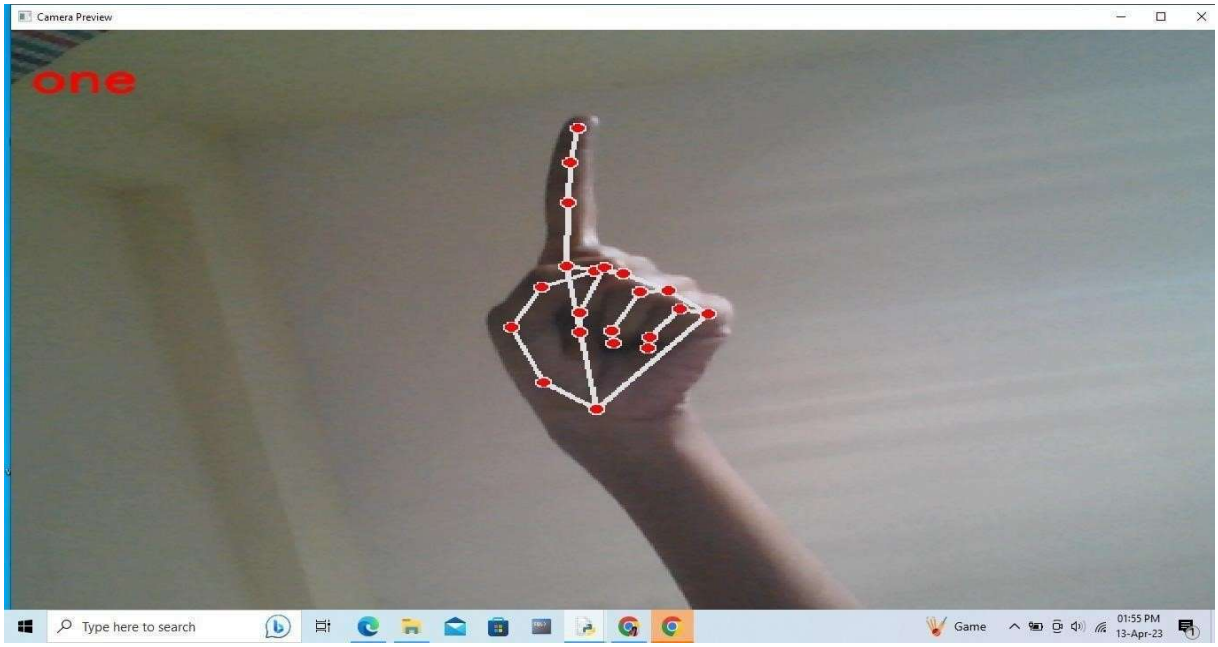

Fig. 6.1.6: Test Case 6

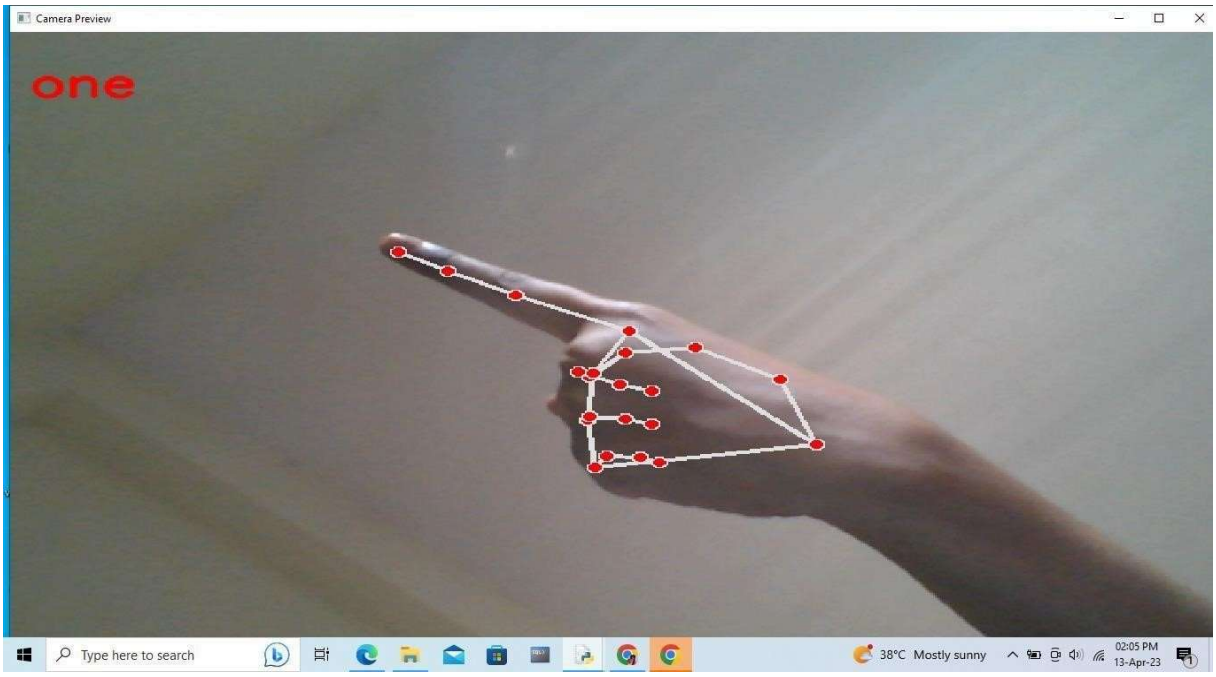

Fig.6.1.7: Test Case 7

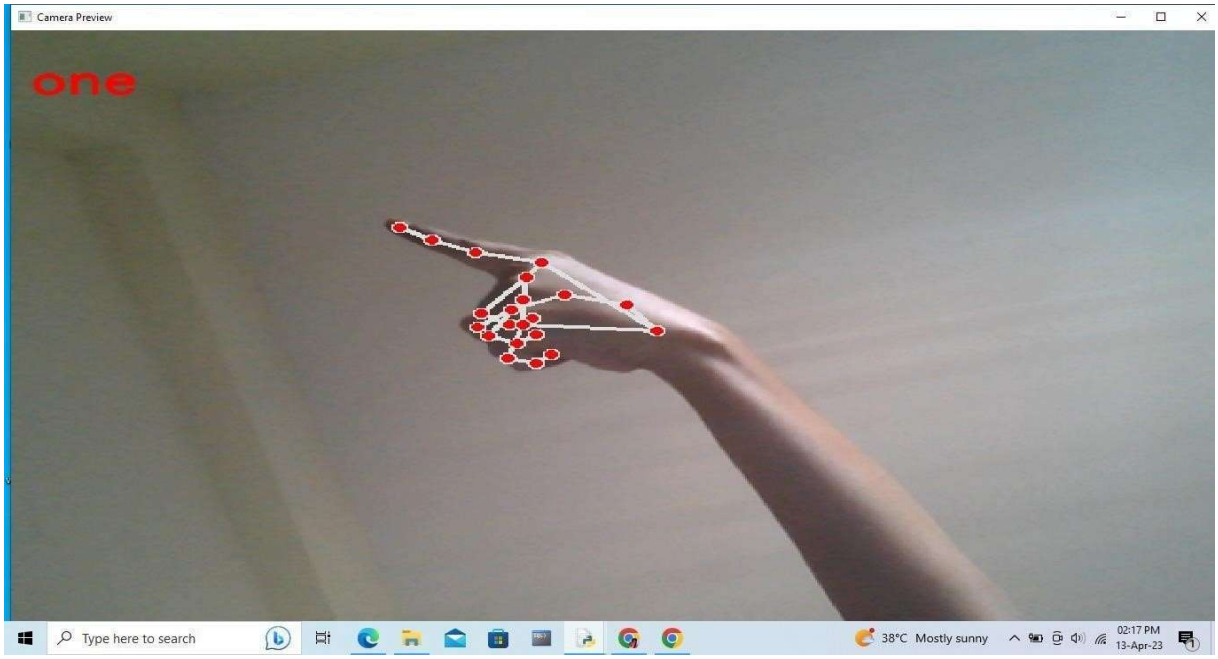

Fig. 6.1.8: Test Case 8

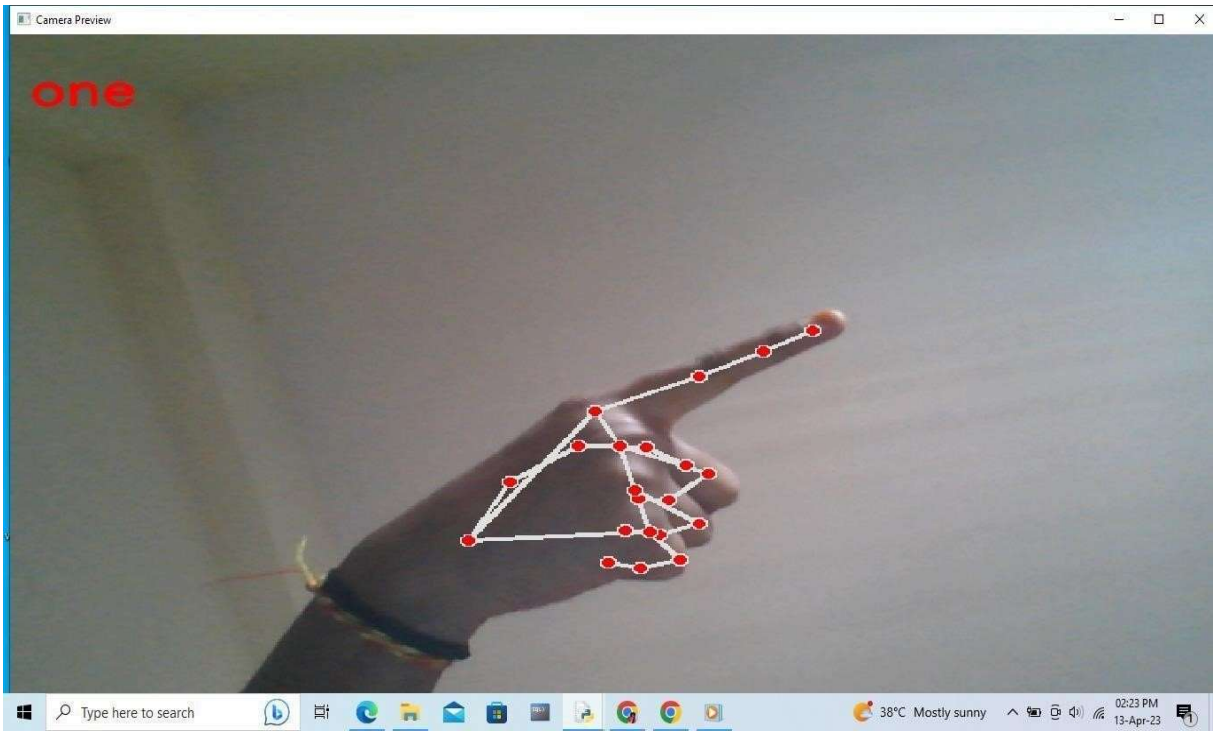

Fig 6.1.9: Test Case 9

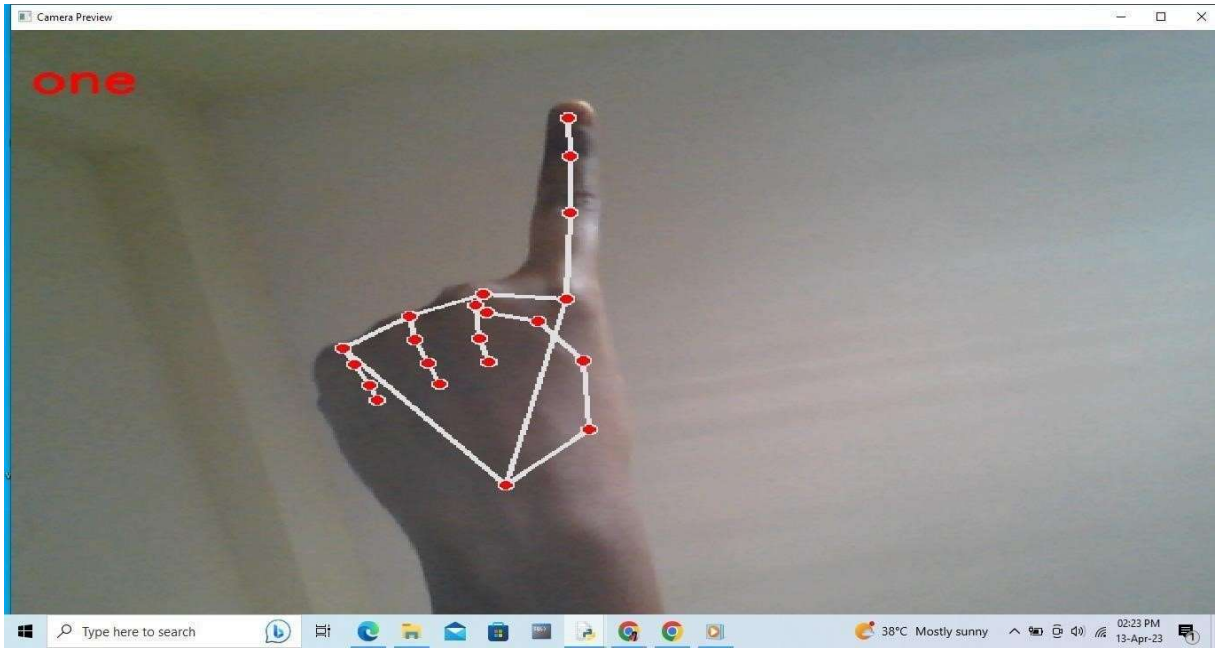

Fig. 6.1.10: Test Case 10

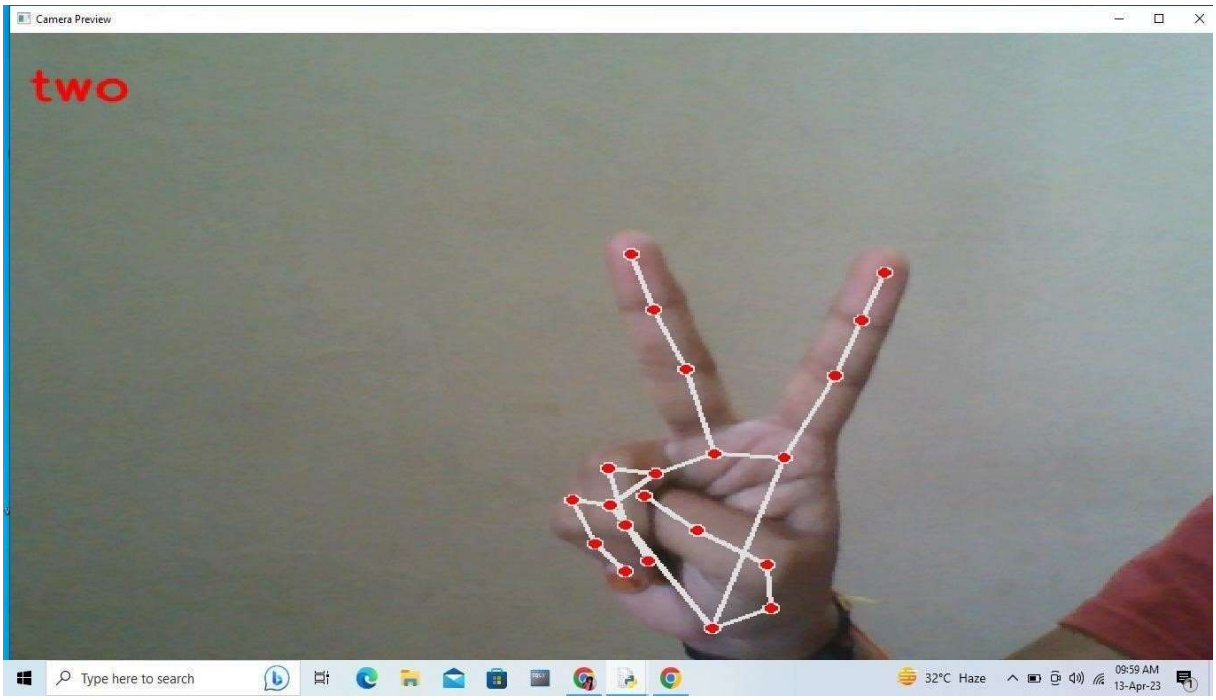

Fig 6.1.11: Test Case 11

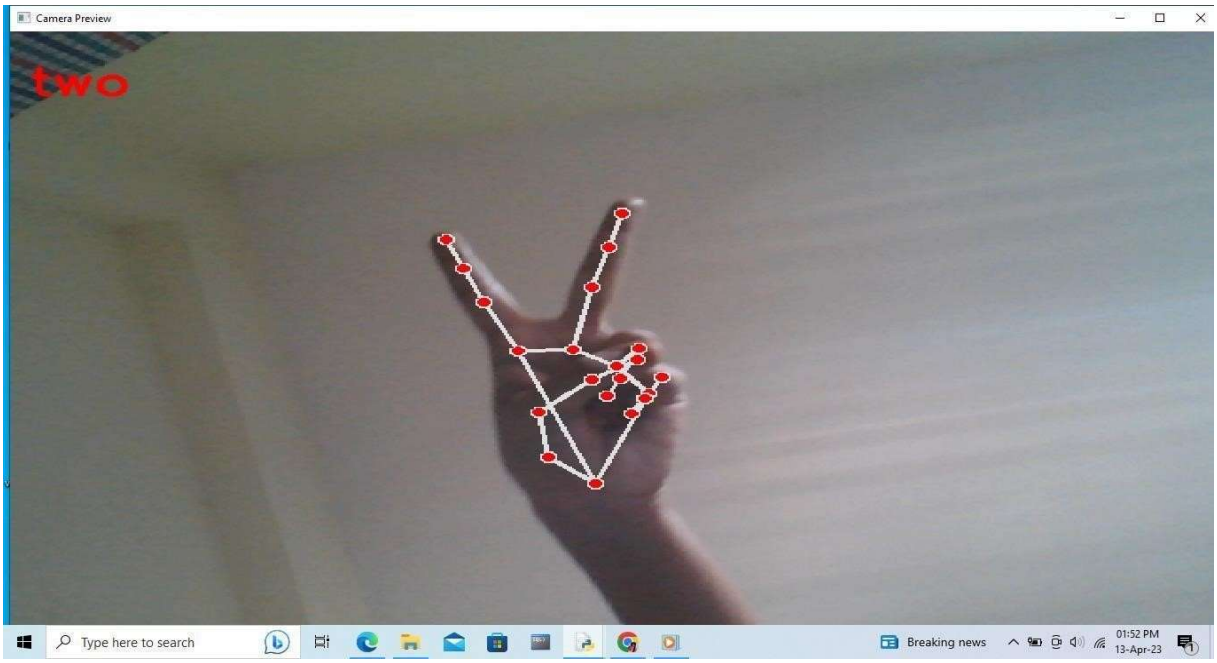

Fig. 6.1.12: Test Case 12

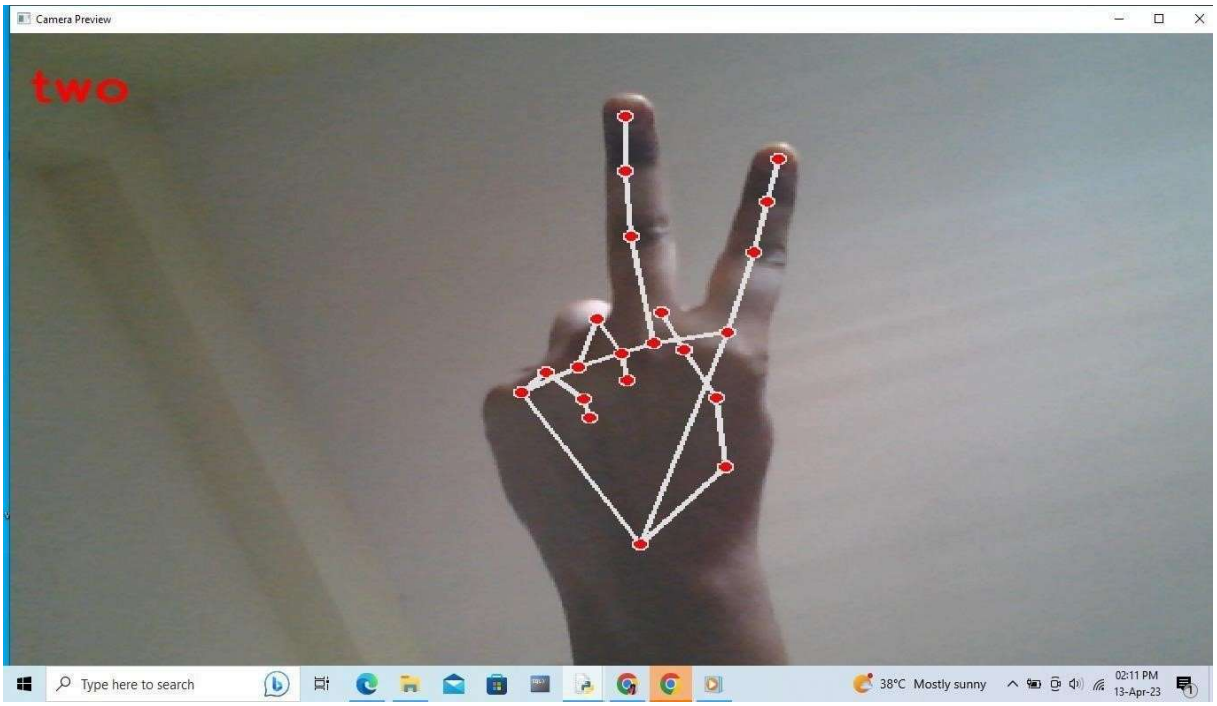

Fig 6.1.13: Test Case 13

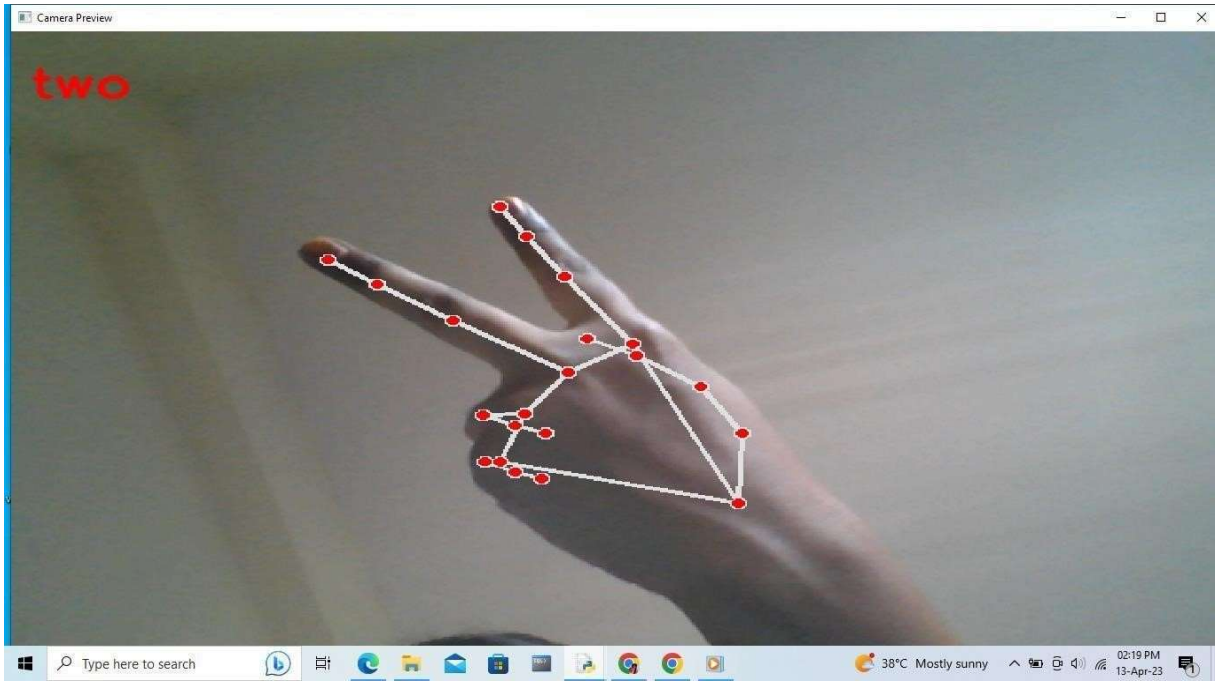

Fig. 6.1.14: Test Case 14

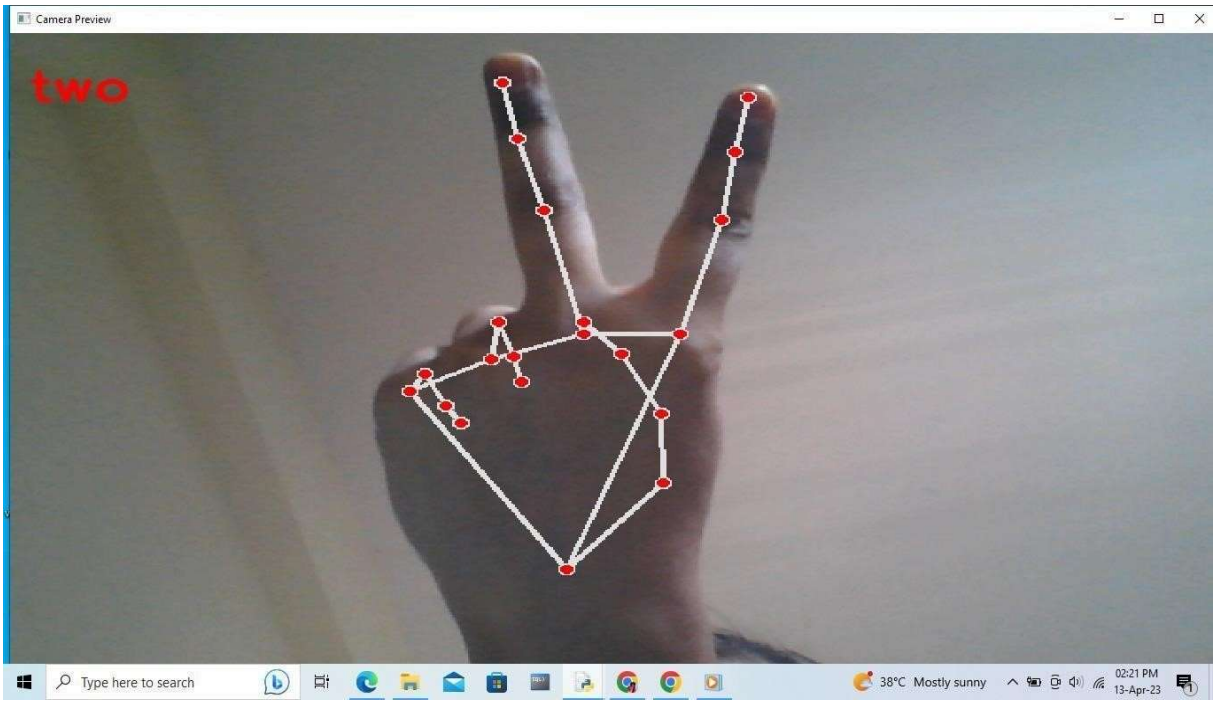

Fig 6.1.15: Test Case 15

Fig. 6.1.16: Test Case 16

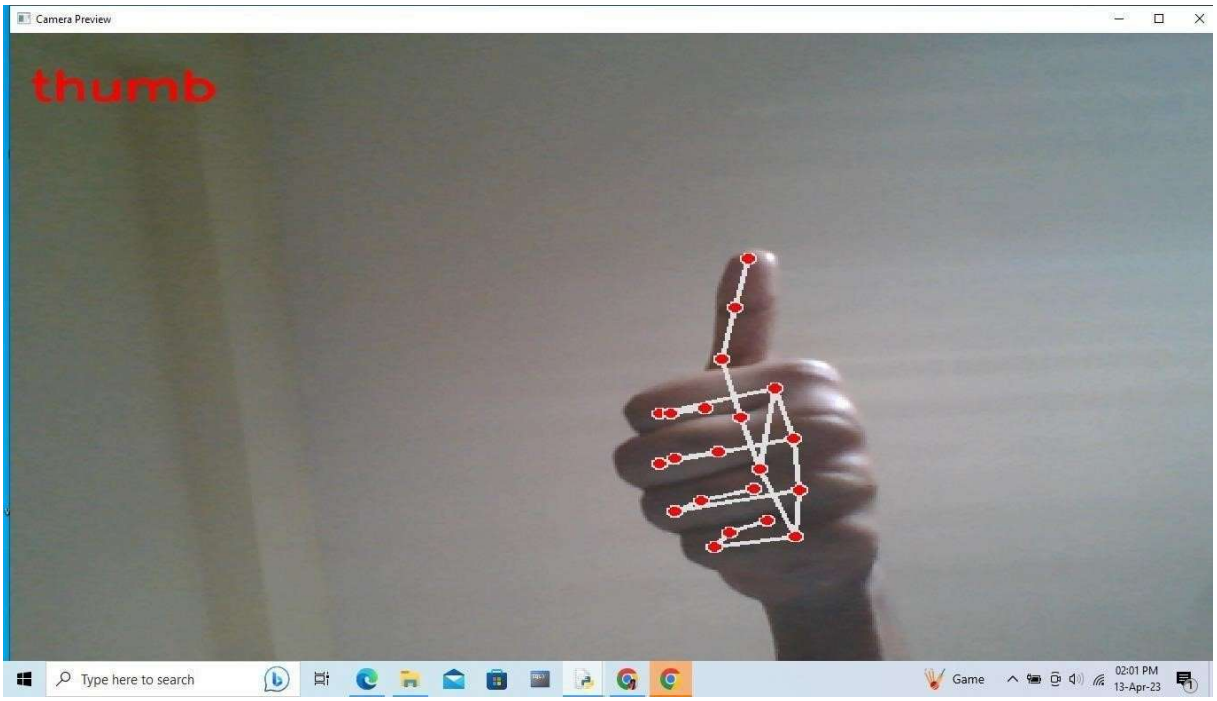

Fig 6.1.17: Test Case 17

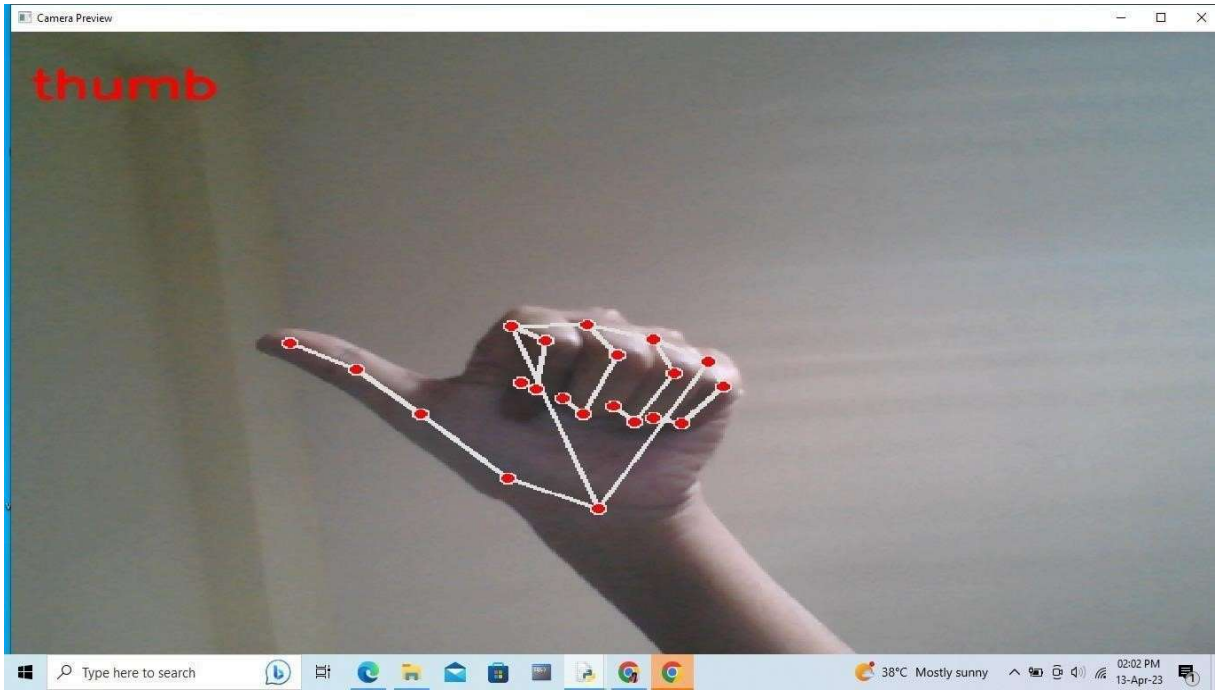

Fig. 6.1.18: Test Case 18

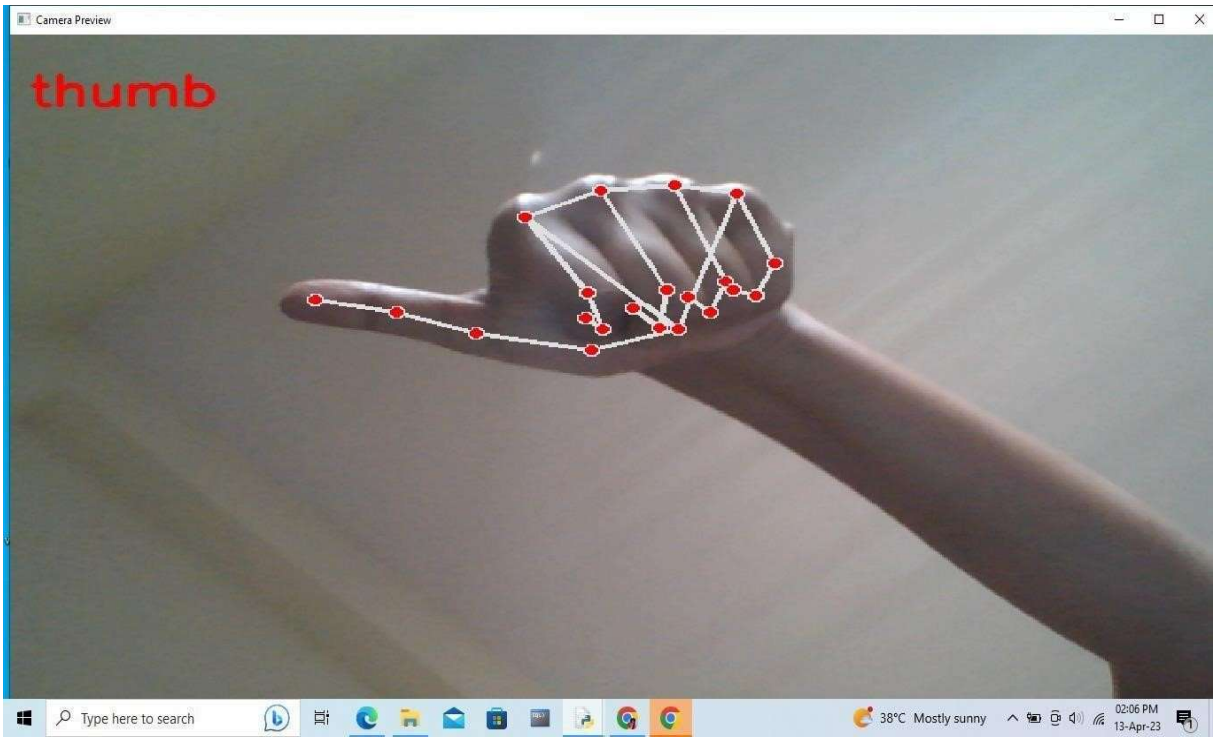

Fig 6.1.19: Test Case 19

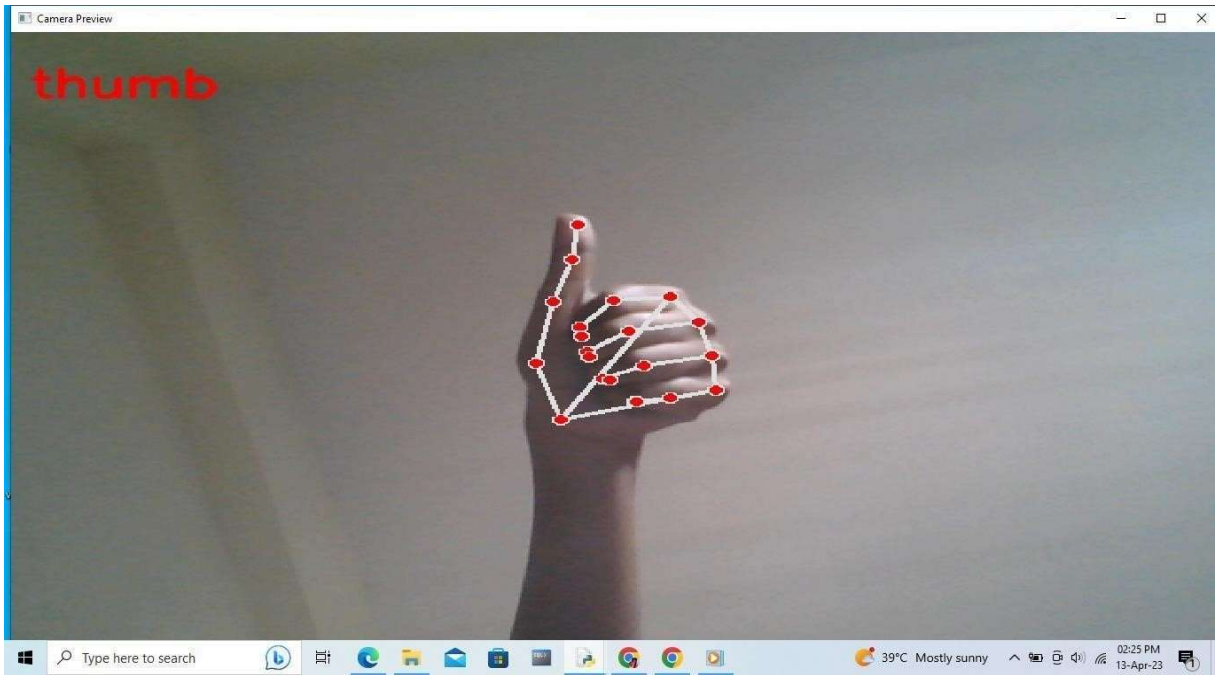

Fig. 6.1.20: Test Case 20

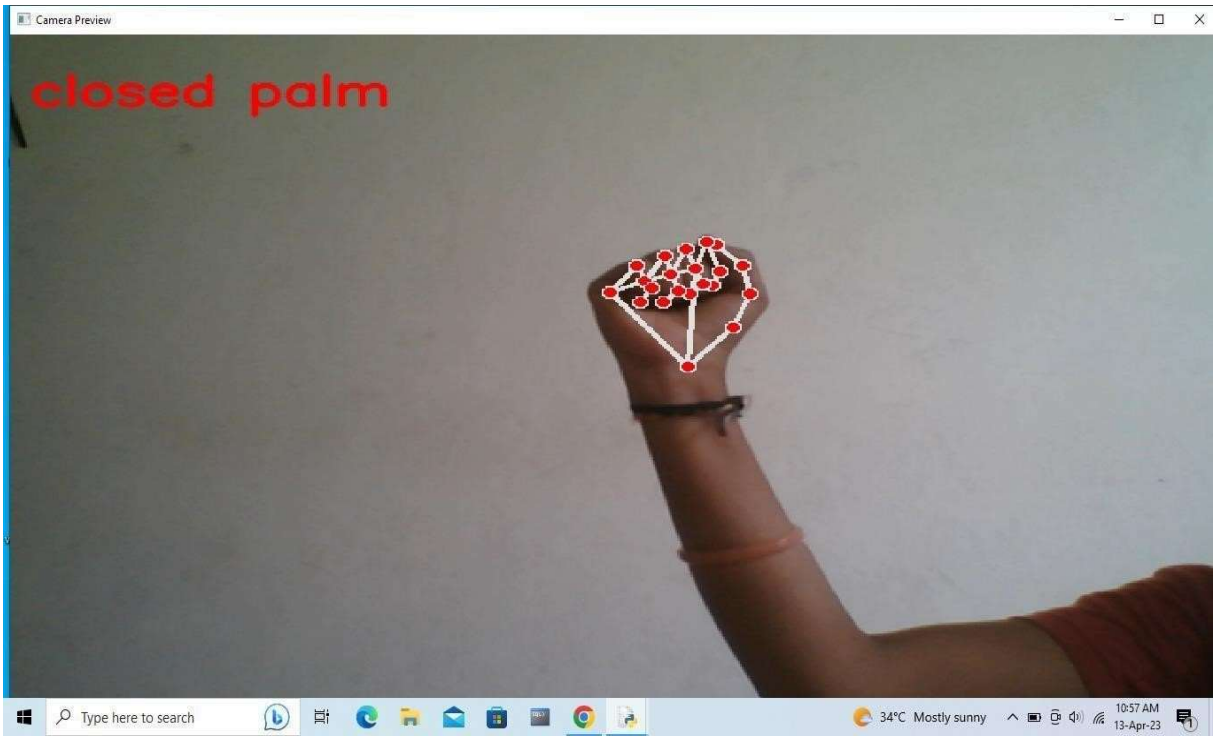

Fig 6.1.21: Test Case 21

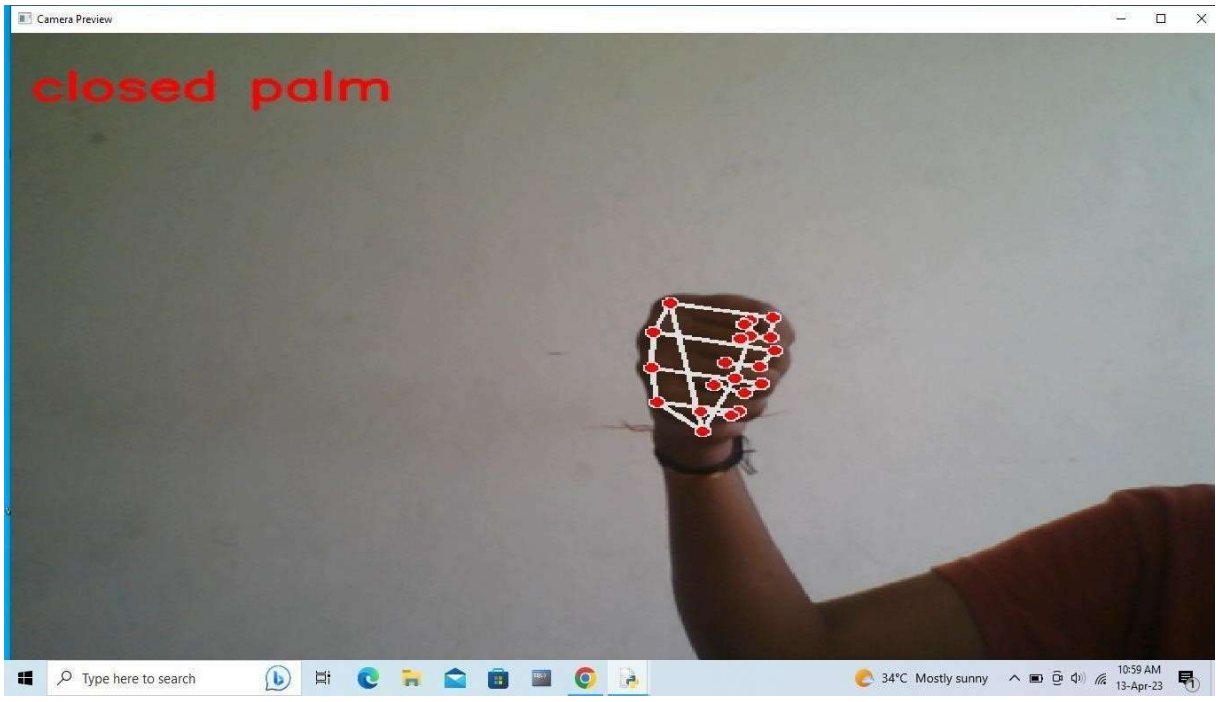

Fig. 6.1.22: Test Case 22

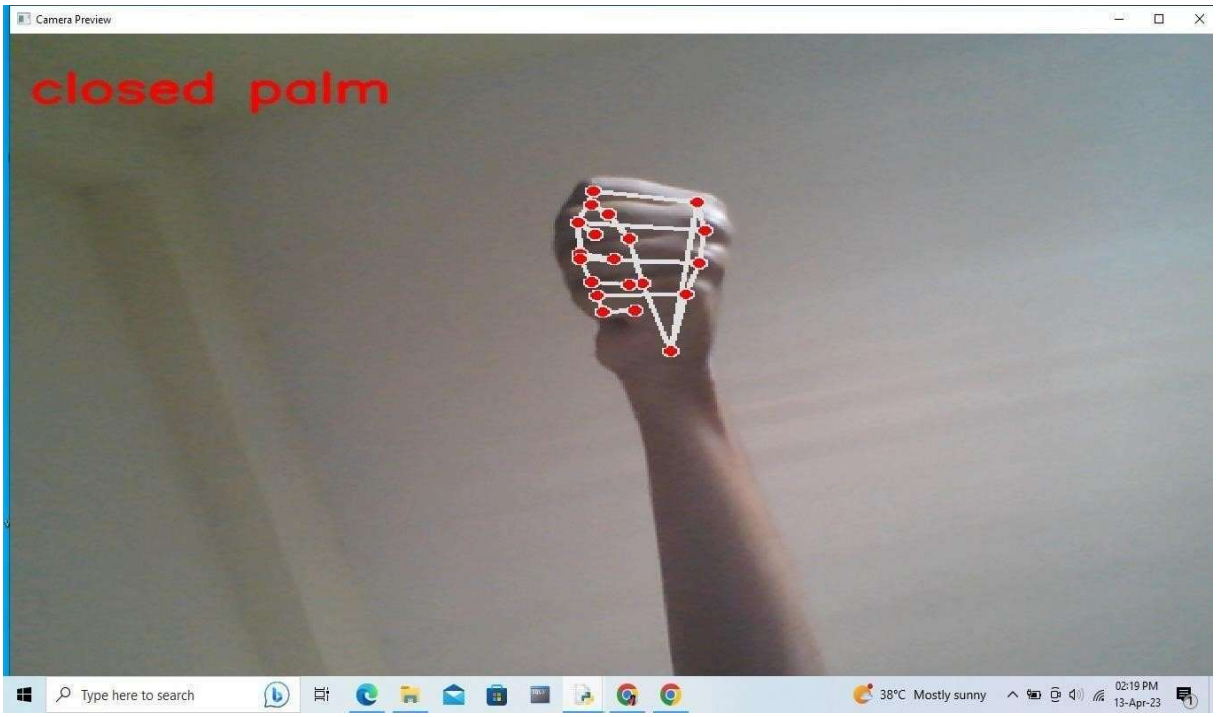

Fig.6.1.23: Test Case 23

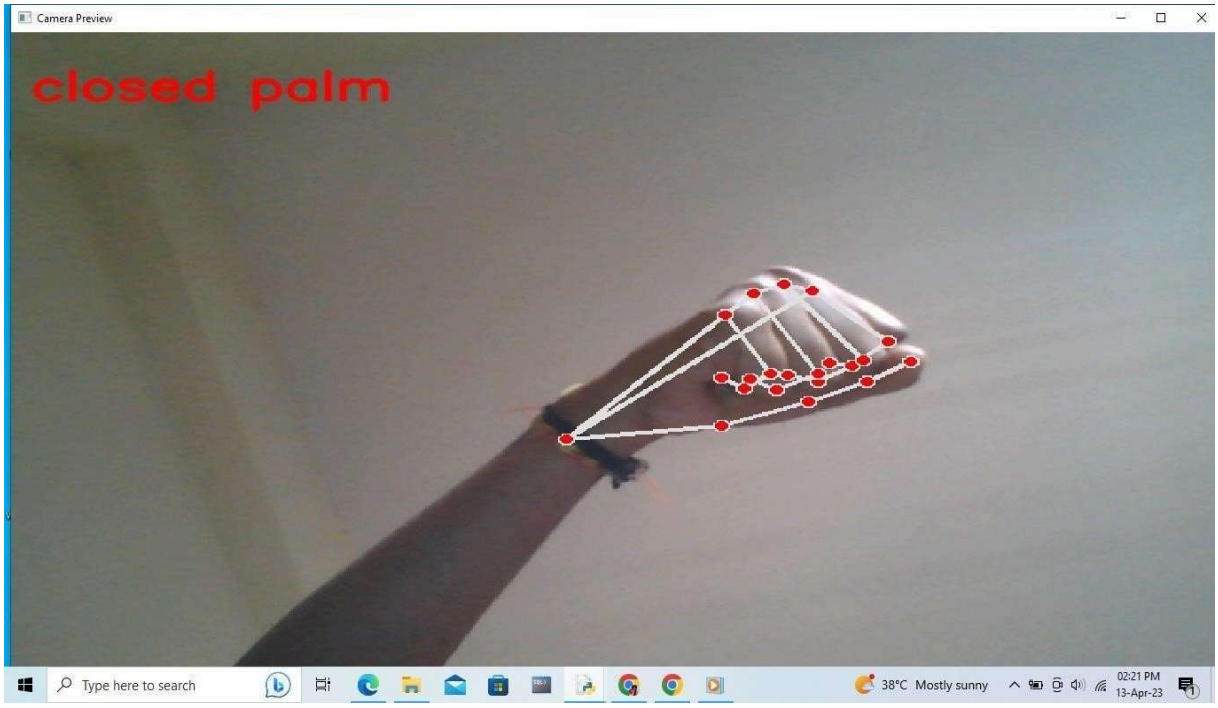

Fig. 6.1.24: Test Case 24

Fig.6.1.25: Test Case 25

Here are two other test cases, where the model is not able to identify the hand gesture provided by the user correctly.

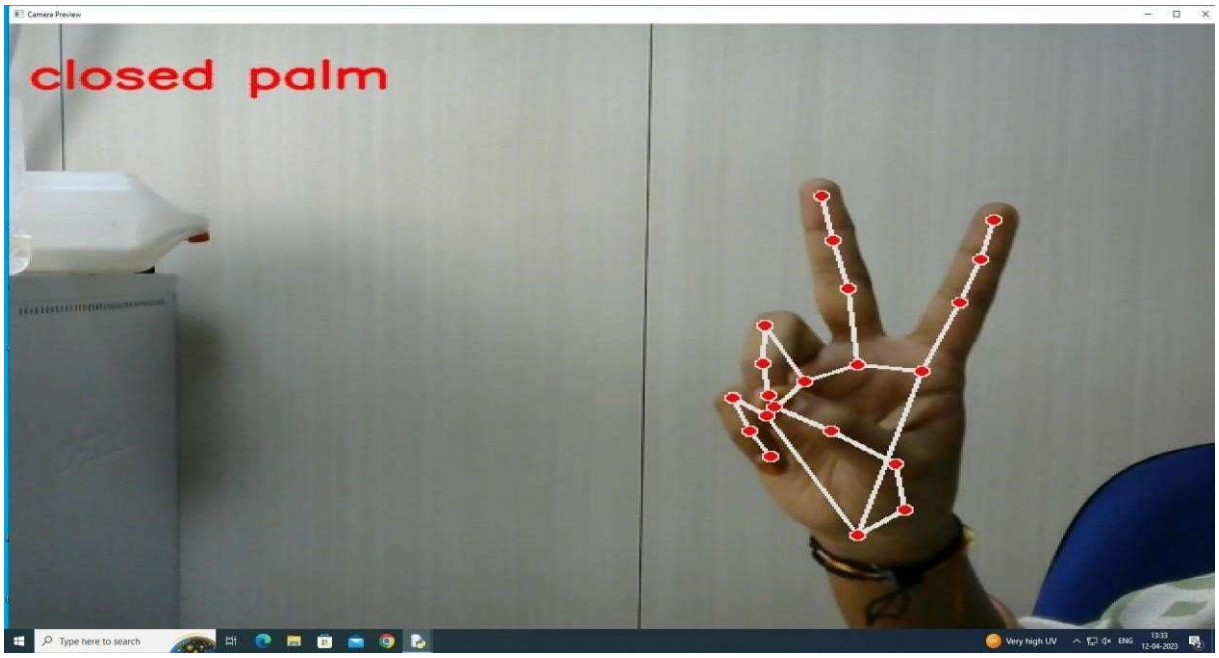

Fig. 6.1.26: Test Case 26

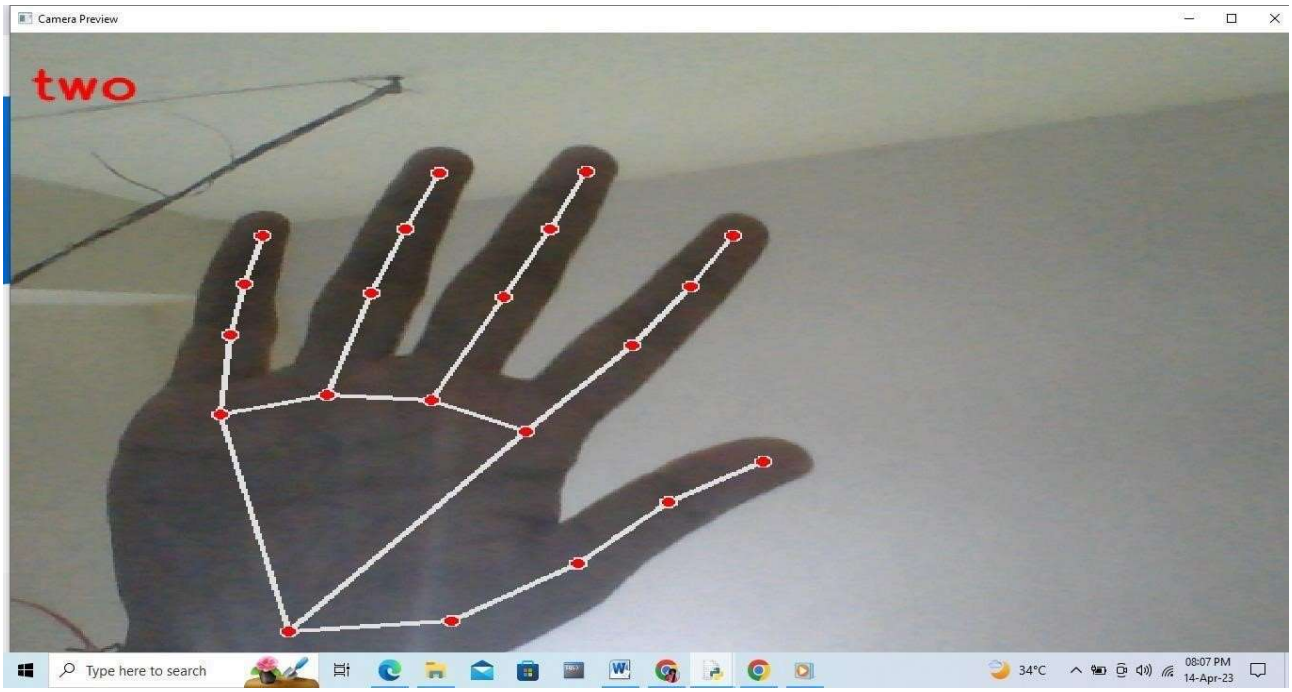

Fig. 6.1.27: Test Case 27

6.2 Results

From the above section it clear that our application can recognise those 5 static hand gestures efficiently. Yet, the ultimate goal of our application is to control system through these hand gestures. So, here are some screenshots which show us the corresponding action being performed in the system when the user provides these hand gestures. Our application can now execute five different basic system operations enabled by five different static hand gestures. But, before proceeding to see the results, here is a table which maps the class labels to the hand gestures and these gestures to their corresponding actions.

Label	Hand Gesture	System Operation
0	Five	Open web browser
1	One	Increase volume
2	Two	Open media player
3	Thumb	Decrease volume
4	Closed Palm	Shutdown

Table 6.2.1: Gesture-Operation Mapping

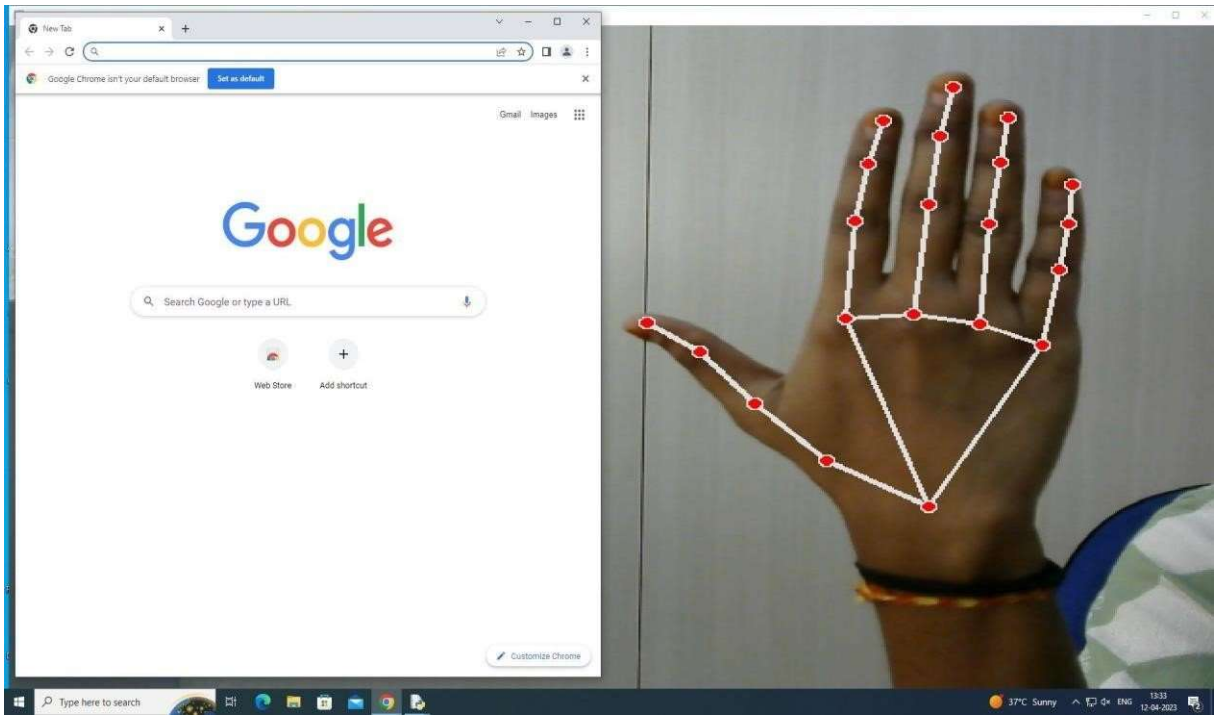

Fig. 6.2.1: Gesture to Open Browser

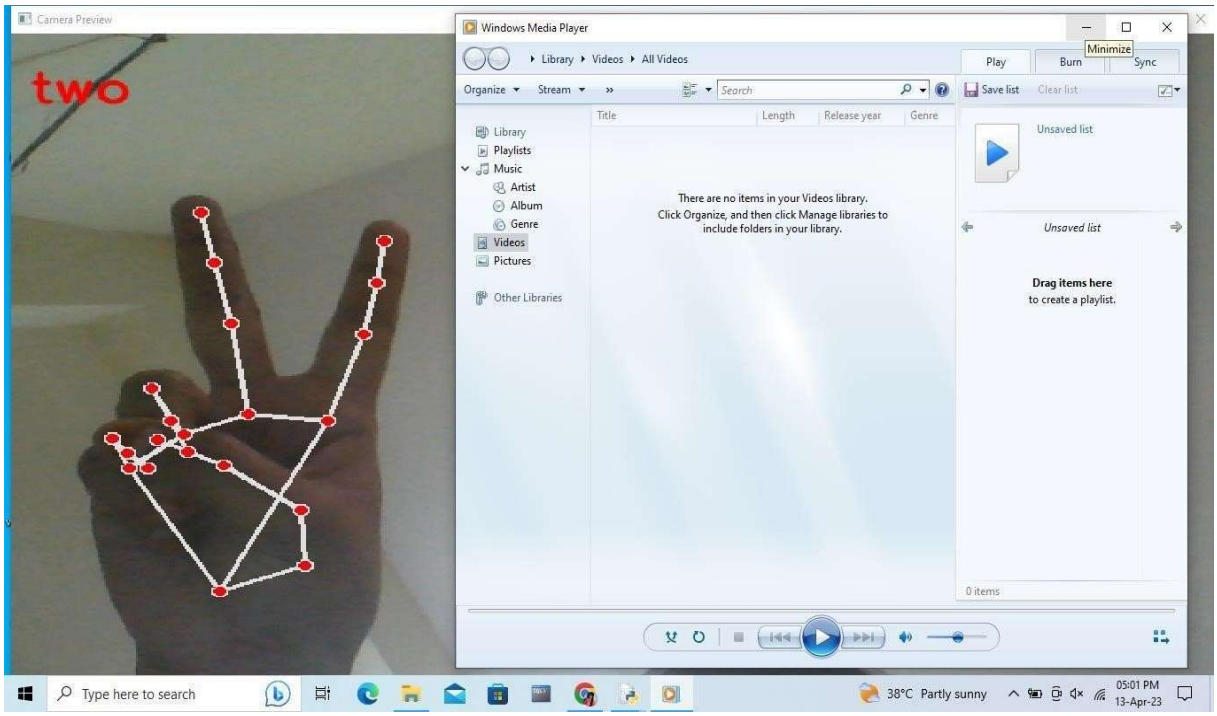

Fig. 6.2.2: Gesture to Open Media Player

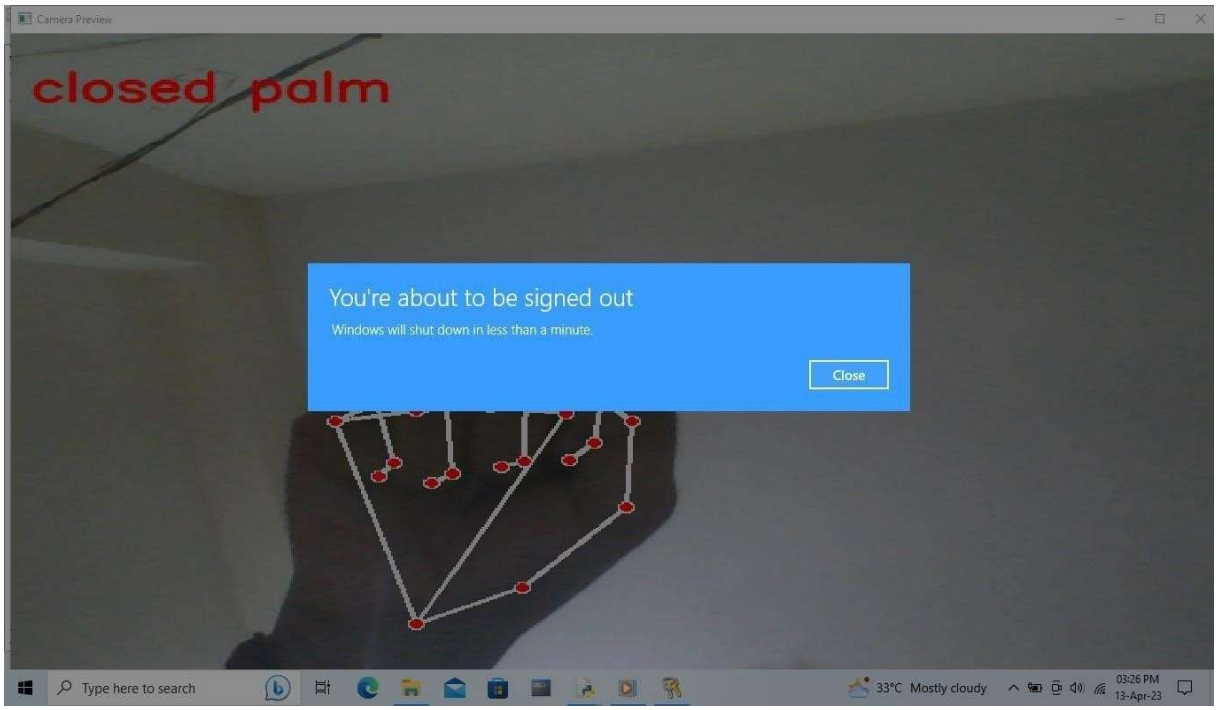

Fig. 6.2.3: Gesture to Shutdown System

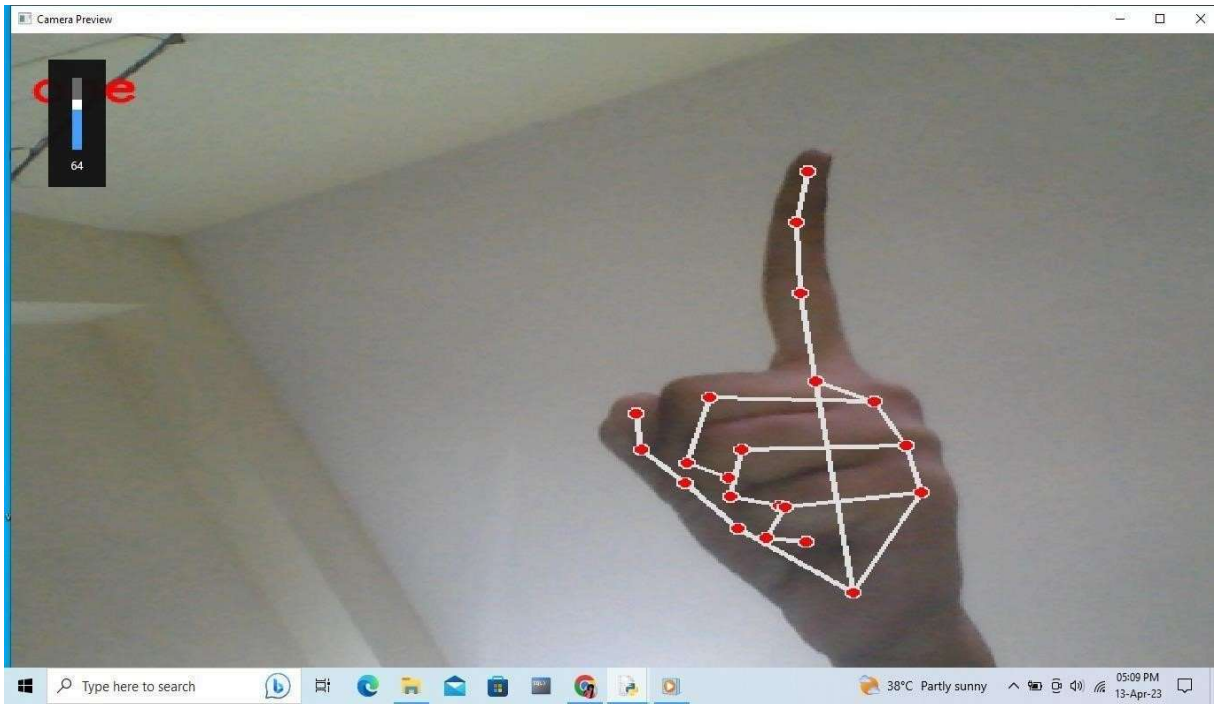

Fig. 6.2.4: Gesture to Increase Volume

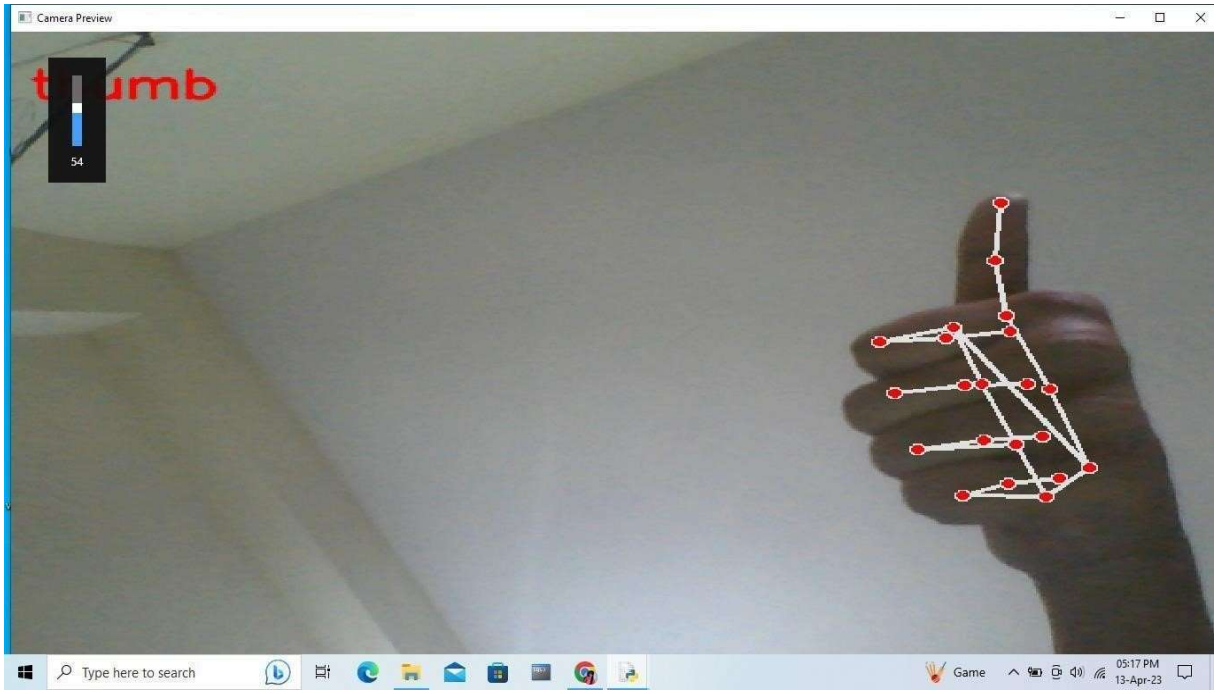

Fig. 6.2.5: Gesture to Decrease Volume

CHAPTER 7

CONCLUSION & FUTURE SCOPE

The ability of computers to recognise hand gestures visually is crucial for progress in human–computer interaction. Gesture recognition has applications ranging from sign language recognition to medical assistance to virtual reality. Today many applications and systems are incorporating touchless user interfaces. The 'Hand Gesture Enabled Commands for Operating Laptops/PCs' application is an attempt to provide user with such touchless user experience while interacting with electronic devices. This application can be used by anyone to control their system using hand gestures and perform basic system operations without having to touch it physically.

Still there is lot of scope for this application and many more enhancements can be made to it. Some of the additional features that can be incorporated in this application are:

- More gestures can be used to operate other basic operations like closing open applications, scrolling operations, saving operations, etc.
- Can include a class of gestures for providing smart and interactive presentation module.
- More hand gesture images can be used to train the ANN classification model to increase the accuracy of the application.
- The ANN model parameters can be tuned further for better performance of the application.

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[7] Dataset containing images of hand signs of 1 to 6 "Hand Gestures Dataset". https://www.kaggle.com/datasets/adeshdalvi41/hand-signs