# Test Case 1:

1. The existing Video Learning project was trained with three small video data set know as Circle, Triangle and Rectangle. Parameters were specified in the code and was used to run the Run1() function. By keeping all the parameters stagnant we have trained the HTM model with the SP + TM and documented the accuracy after 10 cycles.

Video Set of Label: **Circle reachs accuracy: 45.714285714285715%**

Video Set of Label: **Rectangle reachs accuracy: 25.71428571428571%**

Video Set of Label: **Triangle reachs accuracy: 88.57142857142857%**

Accuracy in Cycle 9(last cycle)**: 53.333333333333336%**

1. Afterwards we have changed the parameter **maxCycles = 15** and kept every other parameter same. The following result was generated after 15 cycles.

Video Set of Label: **Circle reachs accuracy: 60%**

Video Set of Label: **Rectangle reachs accuracy: 37.142857142857146%**

Video Set of Label: **Triangle reachs accuracy: 82.85714285714286%**

Accuracy in Cycle 14(last cycle)**: 60%**

1. It seems that the average accuracy after the training has been increased and the Triangle accuracy is dropped but the other two data set accuracy increased. To really measure the impact of **maxCycles** parameter we have increased its number to **20** and calculated the following result.

Video Set of Label: **Circle reachs accuracy: 65.71428571428571%**

Video Set of Label: **Rectangle reachs accuracy: 42.857142857142854%**

Video Set of Label: **Triangle reachs accuracy: 100%**

Accuracy in Cycle 19(last cycle)**: 69.5238095238095%**

1. Now we have increased the number of maxCycles parameter to 25 and generated the following result.

Video Set of Label: **Circle reachs accuracy: 45.714285714285715%**

Video Set of Label: **Rectangle reachs accuracy: 37.142857142857146%**

Video Set of Label: **Triangle reachs accuracy: 88.57142857142857%**

Accuracy in Cycle 24(last cycle)**: 57.14285714285714%**

1. So, we have seen that 20 max cycles gives us the highest training accuracy. We have taken one random frame from each of the Converted video set folders and experimented the prediction section of the code when the maxCycles = 20.
2. We took frame no 3 which is Circle\_circle\_3.png and found the result below.

**Predicted nextFrame: Circle\_circle\_4**

Predicted nextFrame: Circle\_circle\_1

Predicted nextFrame: Circle\_circle\_2

Predicted nextFrame: Circle\_circle\_3

**Predicted nextFrame: Circle\_circle\_5**

**Predicted nextFrame: Circle\_circle\_6**

**Predicted nextFrame: Circle\_circle\_7**

**Predicted nextFrame: Circle\_circle\_8**

**Predicted nextFrame: Circle\_circle\_9**

Initially it has predicted the next frame to be frame 4 and after some wrong prediction it successfully predicted the next five frames.

1. We took frame no 7 which is Rectangle\_rectangle\_7.png and found the result below.

**Predicted nextFrame: Rectangle\_rectangle\_8**

Predicted nextFrame: Rectangle\_rectangle\_24

Predicted nextFrame: Rectangle\_rectangle\_7

Predicted nextFrame: Rectangle\_rectangle\_8

Predicted nextFrame: Circle\_circle\_0

Predicted nextFrame: Circle\_circle\_1

Predicted nextFrame: Circle\_circle\_2

Predicted nextFrame: Circle\_circle\_3

Initially it has predicted the next frame to be frame 8 but after that it predicted wrong frames.

1. We took frame no 13 which is Triangle\_triangle\_13.png and found the result below.

**Predicted nextFrame: Triangle\_triangle\_14**

**Predicted nextFrame: Triangle\_triangle\_15**

**Predicted nextFrame: Triangle\_triangle\_16**

**Predicted nextFrame: Triangle\_triangle\_17**

**Predicted nextFrame: Triangle\_triangle\_18**

**Predicted nextFrame: Triangle\_triangle\_19**

**Predicted nextFrame: Triangle\_triangle\_20**

**Predicted nextFrame: Triangle\_triangle\_21**

**Predicted nextFrame: Triangle\_triangle\_22**

**Predicted nextFrame: Triangle\_triangle\_23**

It has successfully predicted the next frames till 23. So the triangle video set is predicted better than any other video data set.