# Assignment – 4
# Report File

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## Testing with n-Components

A random number generator generates 5 different values for components over a range of (1,50). The value obtained for different numbers of components value. The highlighted row indicates the best score obtained for each model. A random number generator generates 5 different values for components over a range of (1,50).

Gesture:  MoveDown
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| Number Of Components = 39   | Score = 562.96 |
| **Number Of Components = 45   | Score = 633.34 |**
| Number Of Components = 48   | Score = 580.72 |
| Number Of Components = 27   | Score = 549.74 |
| Number Of Components = 30   | Score = 616.94 |
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Gesture:  MoveLeft
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| Number Of Components = 39   | Score = 997.29 |
| Number Of Components = 45   | Score = 1009.78 |
| **Number Of Components = 48   | Score = 1012.25 |**
| Number Of Components = 27   | Score = 957.94 |
| Number Of Components = 30   | Score = 997.53 |
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Gesture:  MoveRight
-----------------------------------------------
| Number Of Components = 39   | Score = 857.55 |
| **Number Of Components = 45   | Score = 906.99 |**
| Number Of Components = 48   | Score = 891.76 |
| Number Of Components = 27   | Score = 823.23 |
| Number Of Components = 30   | Score = 859.72 |
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Gesture:  MoveUp
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| Number Of Components = 39   | Score = 806.50 |
| **Number Of Components = 45   | Score = 809.49 |**
| Number Of Components = 48   | Score = 759.26 |
| Number Of Components = 27   | Score = 756.77 |
| Number Of Components = 30   | Score = 733.56 |
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Gesture:  Press
-----------------------------------------------
| **Number Of Components = 39   | Score = 676.91 |**
| Number Of Components = 45   | Score = 649.84 |
| Number Of Components = 48   | Score = 675.09 |
| Number Of Components = 27   | Score = 460.62 |
| Number Of Components = 30   | Score = 637.03 |
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Gesture:  ZoomIn

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| Number Of Components = 39   | Score = 191.32 |
| Number Of Components = 45   | Score = 207.05 |
| Number Of Components = 48   | Score = 153.34 |
| Number Of Components = 27   | Score = 277.60 |
| Number Of Components = 30   | Score = 255.21 |
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Gesture:  ZoomOut
-------------------------------------------------
| Number Of Components = 39   | Score = 173.31 |
| Number Of Components = 45   | Score = 130.40 |
| Number Of Components = 48   | Score = 144.85 |
| Number Of Components = 27   | Score = 185.62 |
| Number Of Components = 30   | Score = 147.27 |
```

## Accuracy Observed

The accuracy observed when tested each model over 10% testing data.

```
MoveDown  | Accuracy = 98.00 %
MoveLeft  | Accuracy = 96.00 %
MoveRight  | Accuracy = 100.00 %
MoveUp  | Accuracy = 96.00 %
Press  | Accuracy = 94.00 %
ZoomIn  | Accuracy = 100.00 %
ZoomOut  | Accuracy = 98.00 %
```
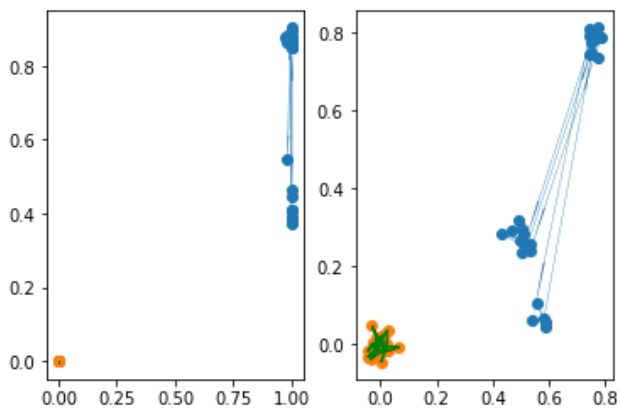
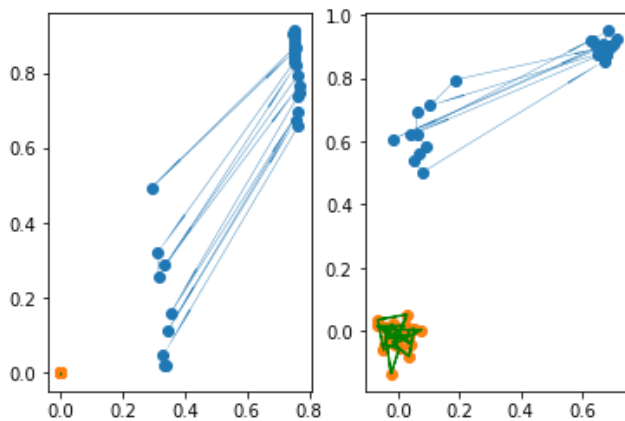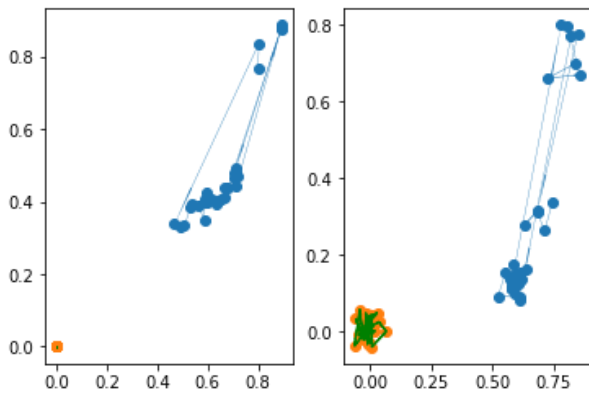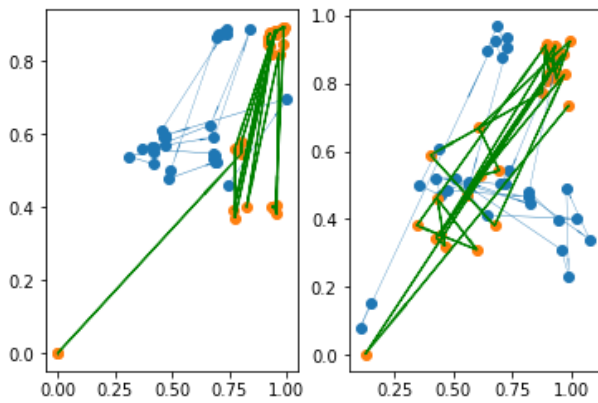## Sampling from HMM
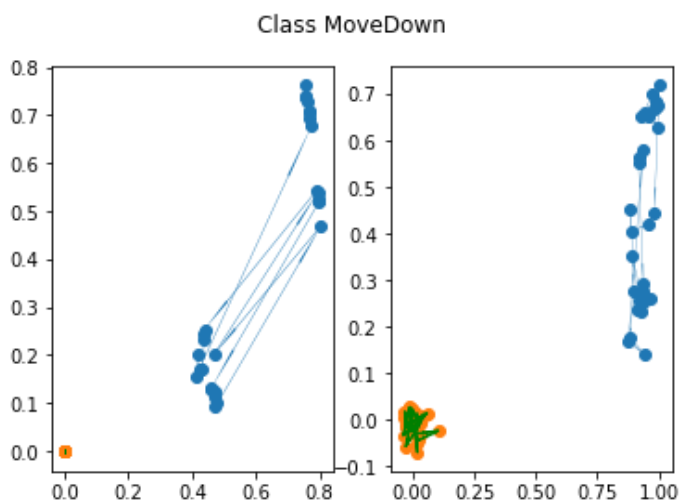


Class MoveDown
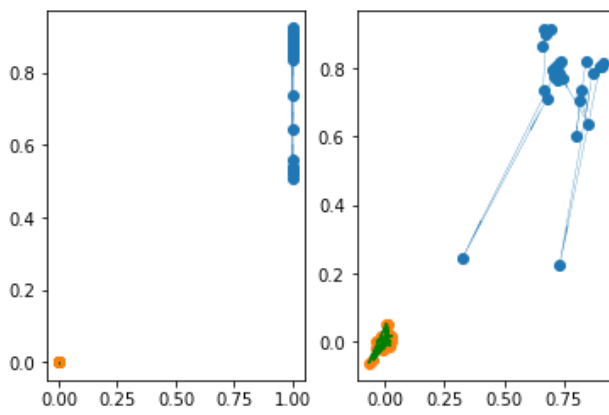
Class MoveLeft

Class MoveRight

Class MoveUp

Class Press

Class ZoomIn

Class ZoomOut