類神經網路作業 3 - SOM 類神經網路

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A. 程式簡介：我實作的是 SOM 網路架構，鄰近函數是選取得勝者周圍的神經元，學習率的更新是使用 Kohonen 的建議。

B. 程式執行說明 我用的程式語言是 Python, 環境是 colab 開發自google, 點進每一個並按下 Shift+Enter 即可執行, 程式必須從上執行到下, 其中, 以下程式碼決定使用的資料：

data = np.loadtxt("**2ring.txt**",dtype=np.float,delimiter=' ')

參數：

net_size, times, learning_rate, input_data

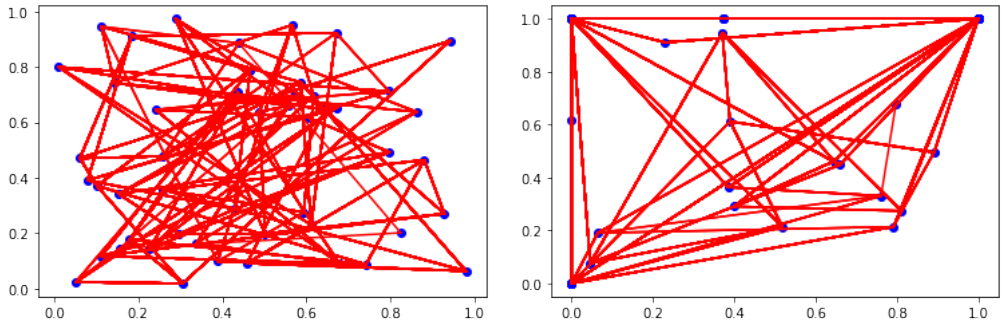
網路大小，循環次數、學習率、資料輸入

C. 以下依序顯示實驗結果並上訓練結果和測試結果，

左圖是初始化，右圖為訓練後

(net_size = 7, times=1000, learning_rate=1)

123.txt



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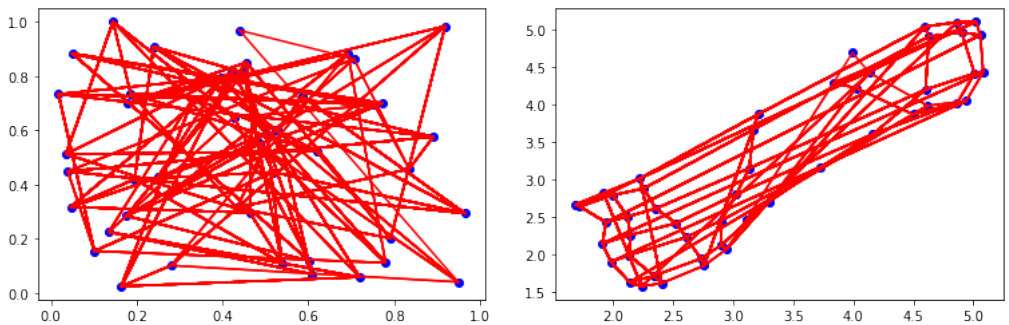

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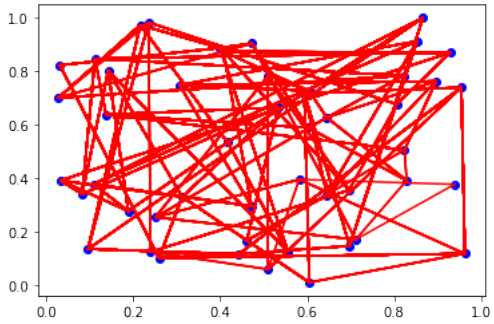
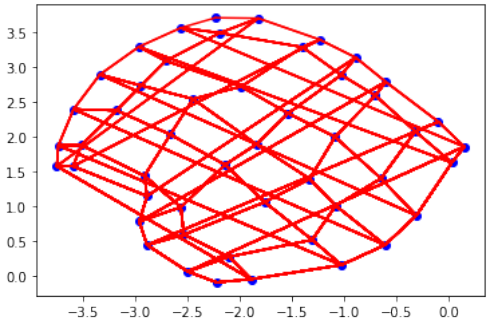

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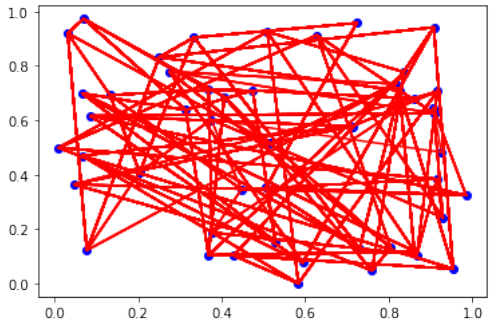
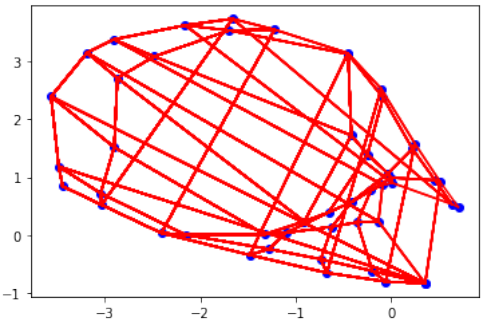

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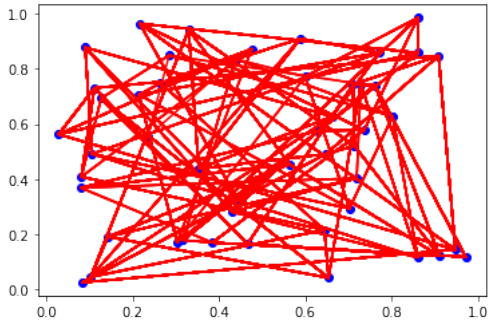
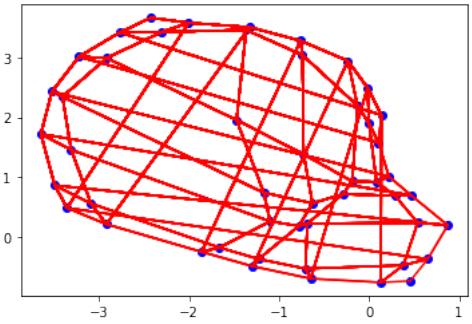
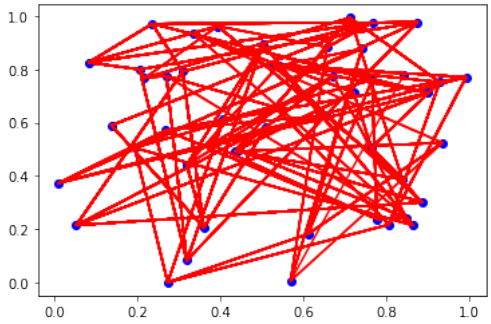
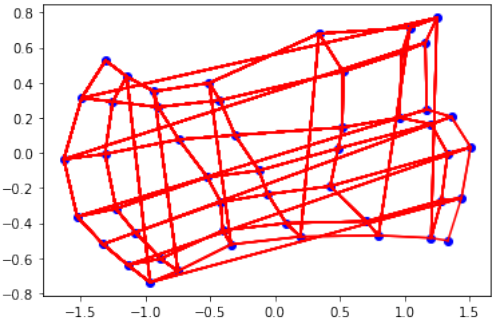



2CloseS.txt

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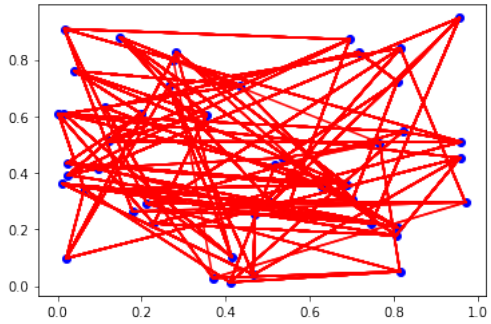
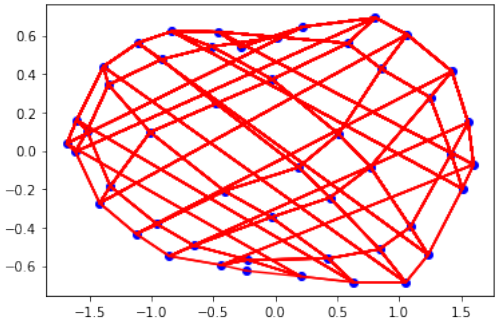

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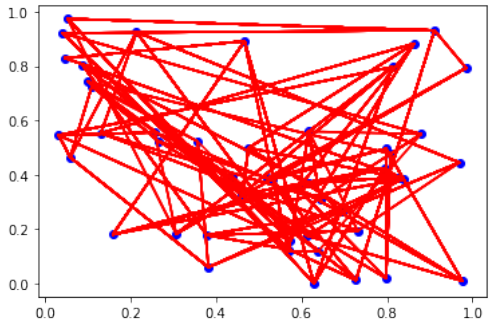
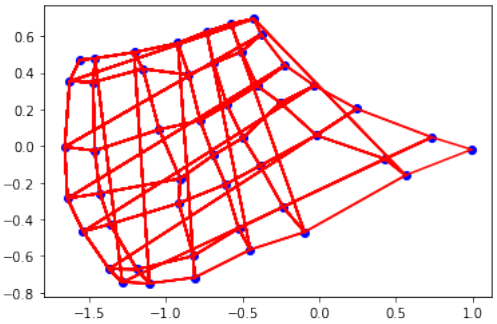

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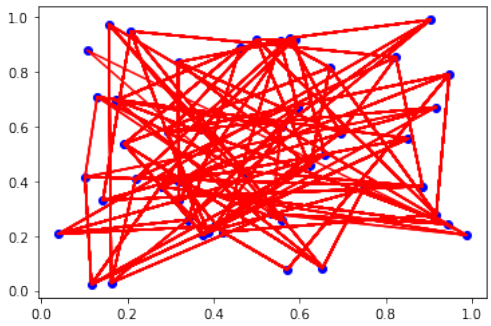
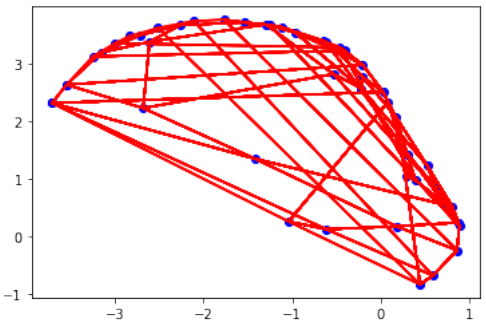

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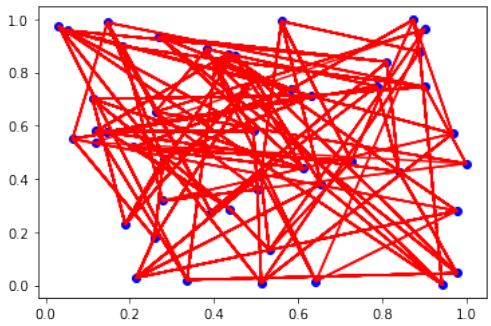
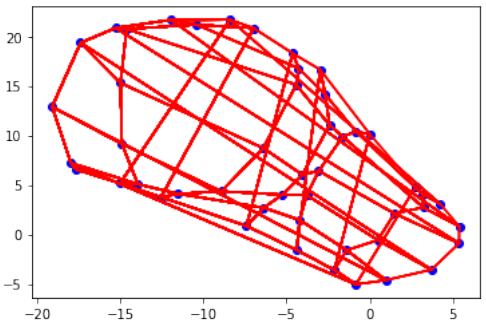

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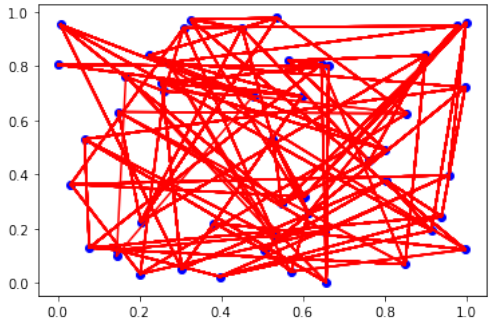

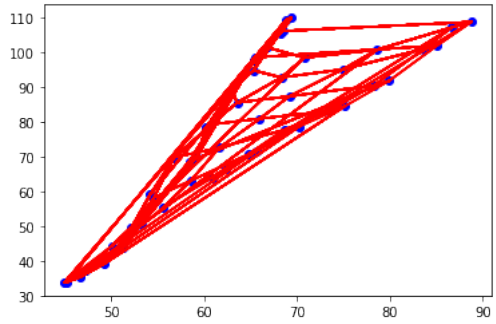

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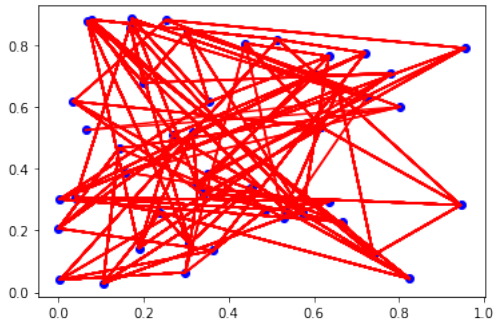

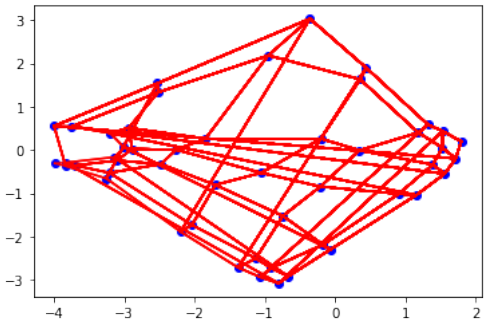

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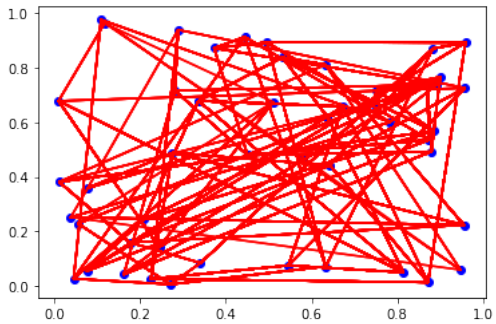

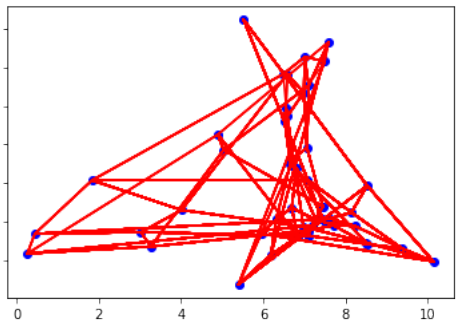

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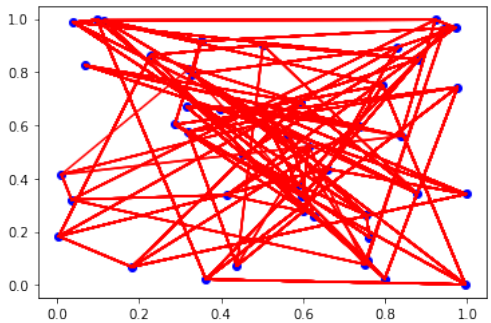

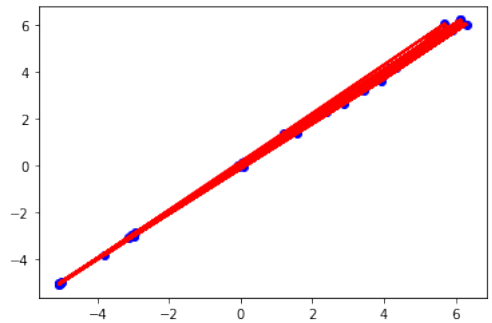

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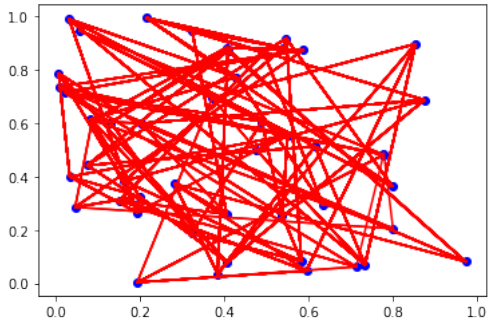

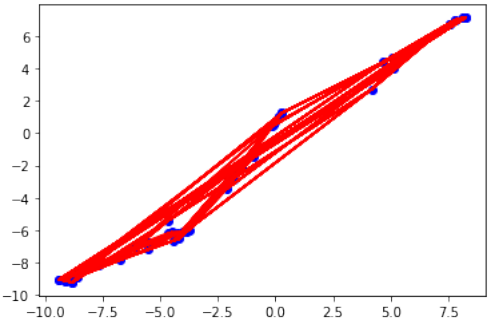

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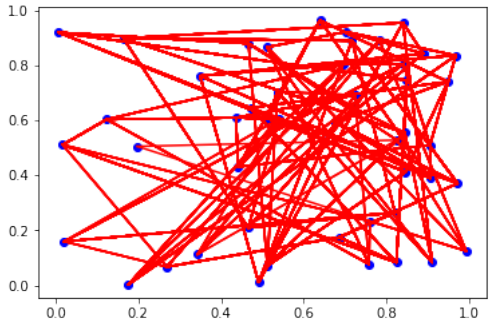

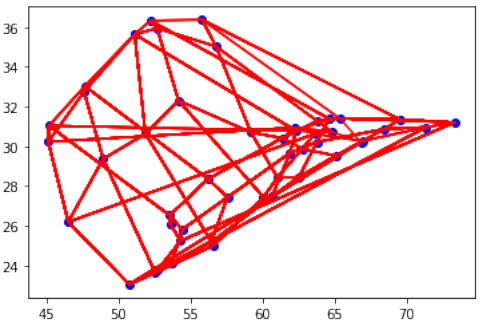

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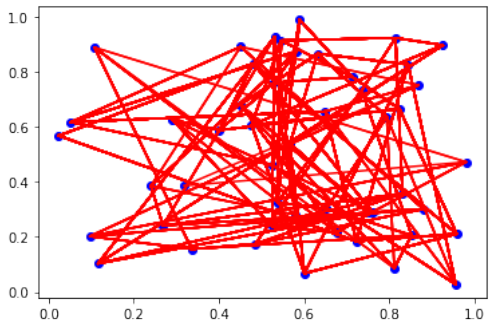

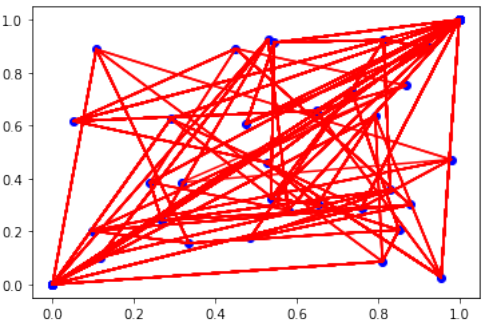

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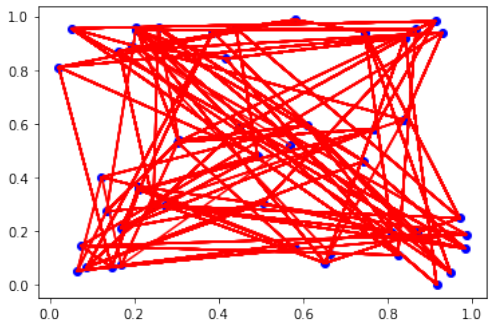

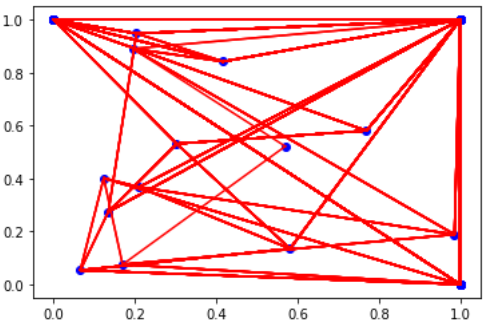

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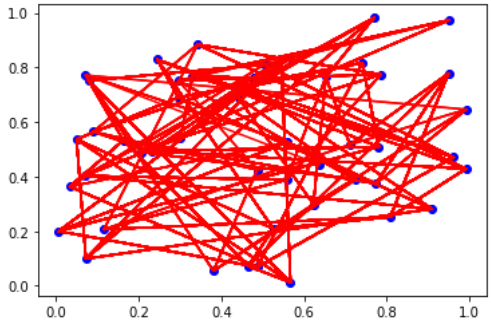
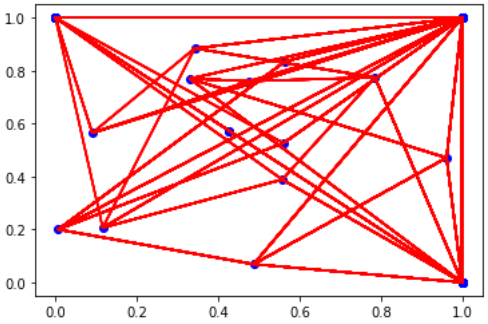

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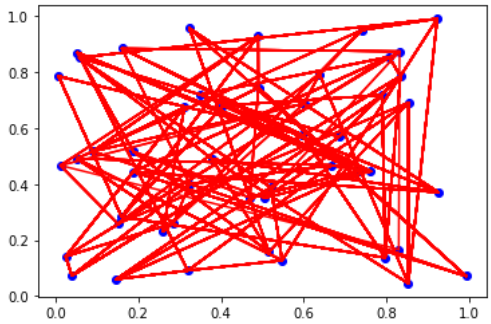
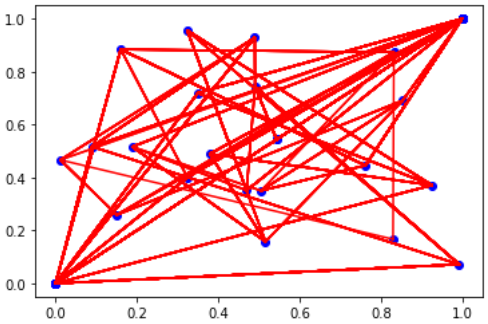

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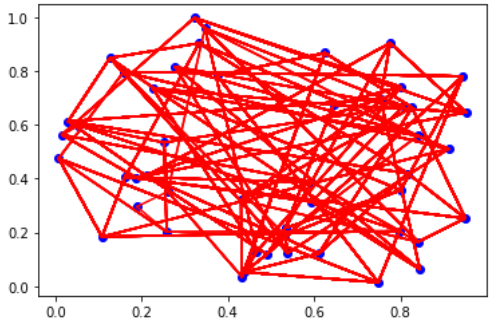
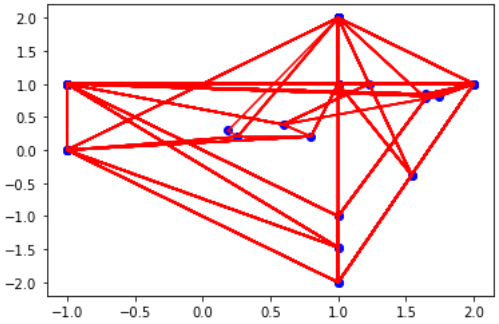

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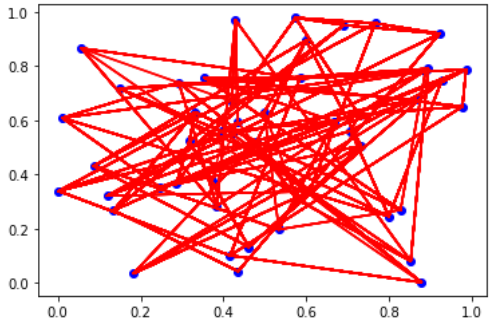
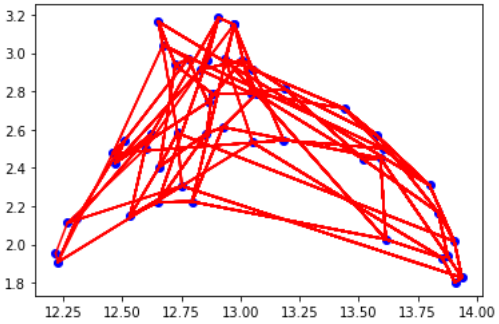

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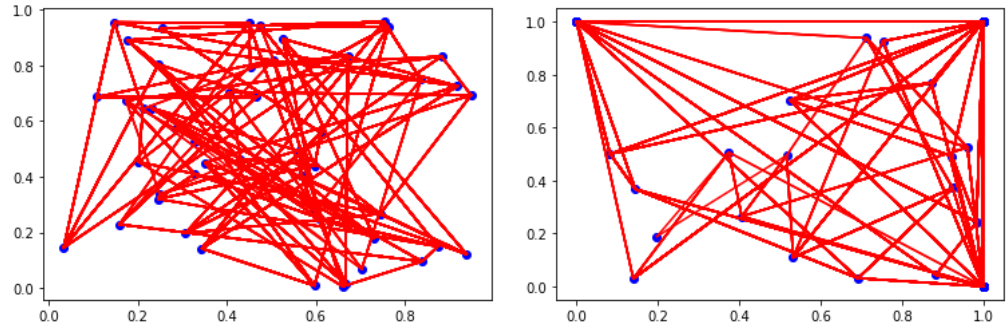

E. 實驗結果分析及討論

我觀察到的是可線性分割的資料的拓撲會比較均勻不容易糾纏，資料集的大小也會影響拓撲的成長，若資料集太少成長有限，資料多的才容易展開。有些拓撲成長後跟資料集的長相很接近！

F. 加分項目

顯示拓蹼時的變化情形(圖形顯示)