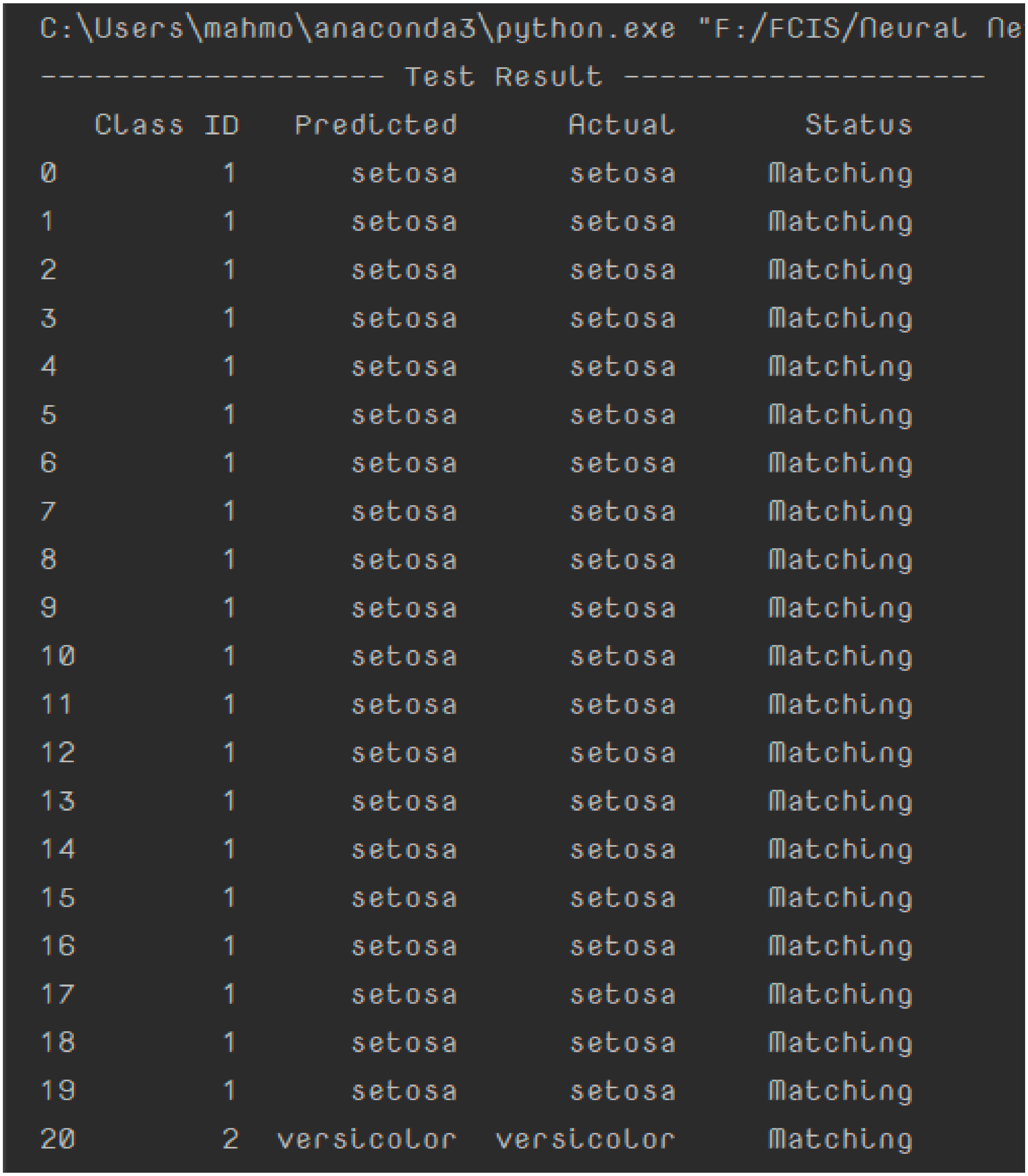
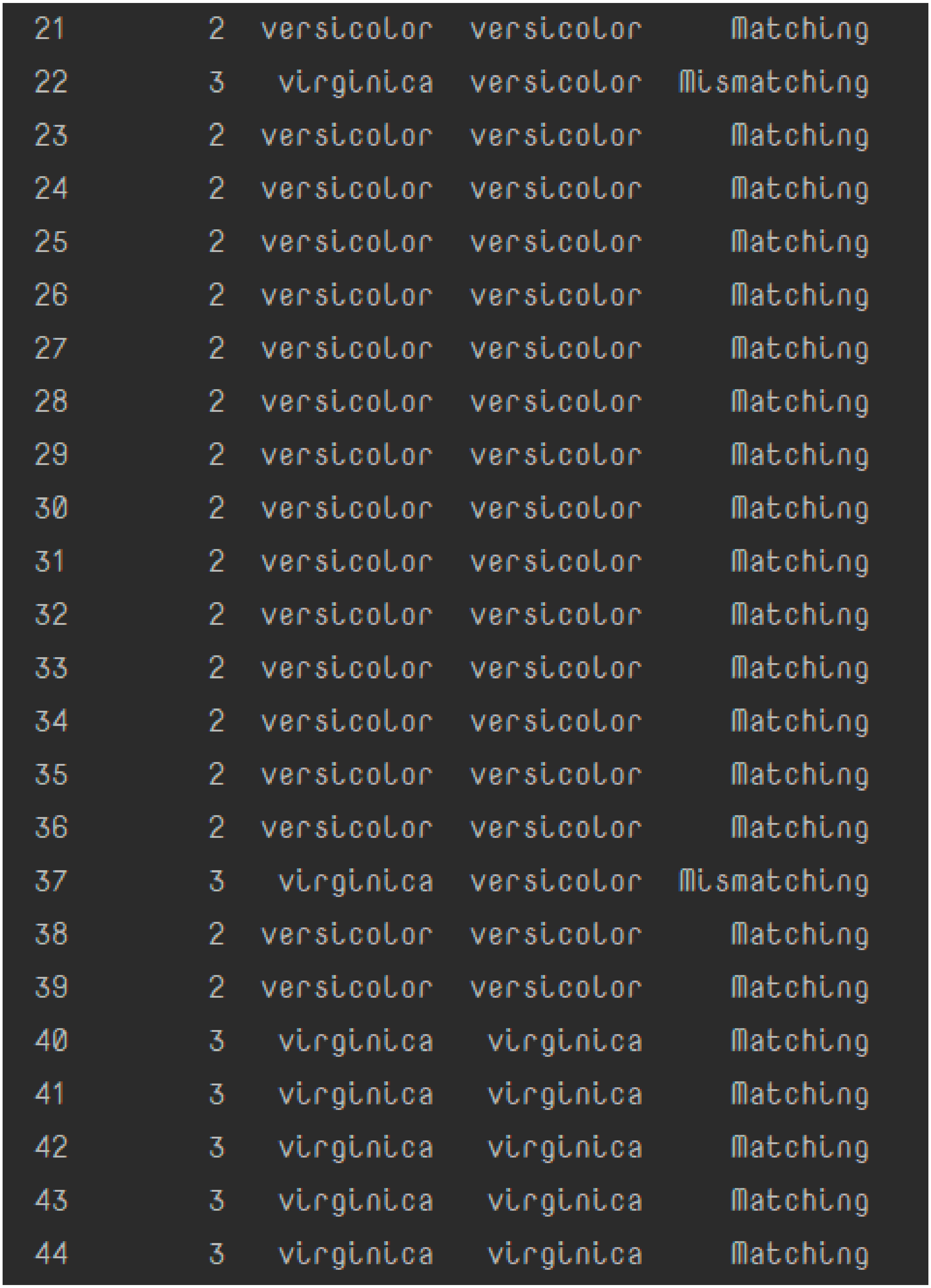
Neural Network | Task 3

Backpropagation for multilayer perceptron

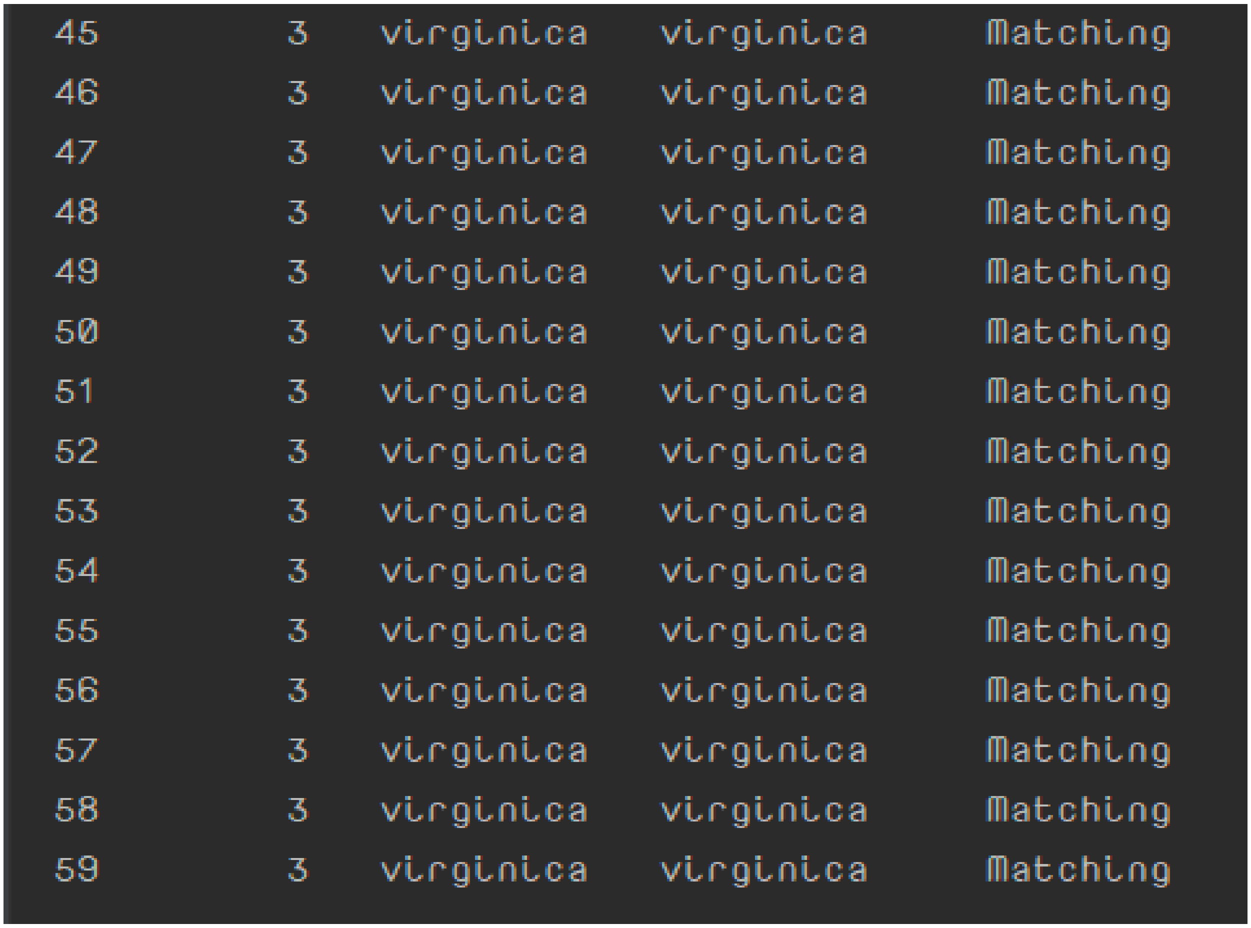
- Screenshots for output



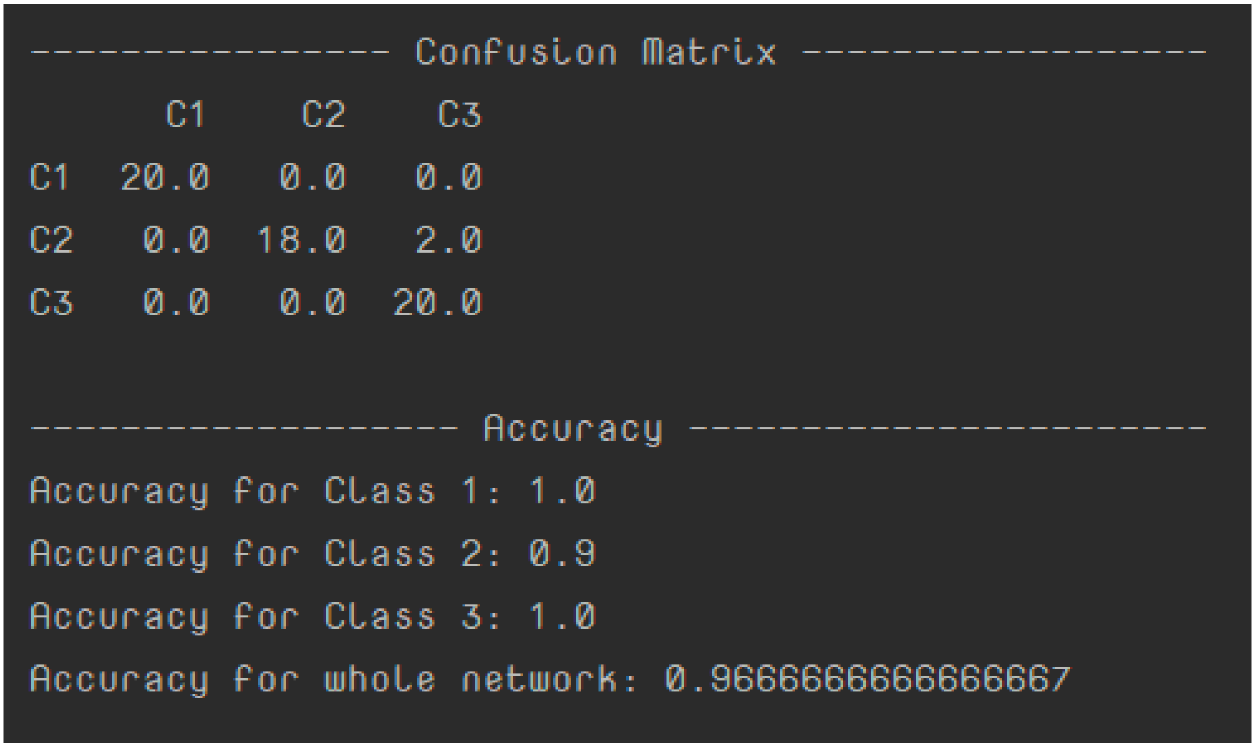
```
C:\Users\mahmo\anaconda3\python.exe "F:/FCIS/Neural Ne
-------------------- Test Result ---------------------
   Class ID   Predicted      Actual        Status
0         1      setosa      setosa      Matching
1         1      setosa      setosa      Matching
2         1      setosa      setosa      Matching
3         1      setosa      setosa      Matching
4         1      setosa      setosa      Matching
5         1      setosa      setosa      Matching
6         1      setosa      setosa      Matching
7         1      setosa      setosa      Matching
8         1      setosa      setosa      Matching
9         1      setosa      setosa      Matching
10        1      setosa      setosa      Matching
11        1      setosa      setosa      Matching
12        1      setosa      setosa      Matching
13        1      setosa      setosa      Matching
14        1      setosa      setosa      Matching
15        1      setosa      setosa      Matching
16        1      setosa      setosa      Matching
17        1      setosa      setosa      Matching
18        1      setosa      setosa      Matching
19        1      setosa      setosa      Matching
20        2  versicolor  versicolor      Matching
```



```
21         2  versicolor  versicolor     Matching
22         3   virginica  versicolor  Mismatching
23         2  versicolor  versicolor     Matching
24         2  versicolor  versicolor     Matching
25         2  versicolor  versicolor     Matching
26         2  versicolor  versicolor     Matching
27         2  versicolor  versicolor     Matching
28         2  versicolor  versicolor     Matching
29         2  versicolor  versicolor     Matching
30         2  versicolor  versicolor     Matching
31         2  versicolor  versicolor     Matching
32         2  versicolor  versicolor     Matching
33         2  versicolor  versicolor     Matching
34         2  versicolor  versicolor     Matching
35         2  versicolor  versicolor     Matching
36         2  versicolor  versicolor     Matching
37         3   virginica  versicolor  Mismatching
38         2  versicolor  versicolor     Matching
39         2  versicolor  versicolor     Matching
40         3   virginica   virginica     Matching
41         3   virginica   virginica     Matching
42         3   virginica   virginica     Matching
43         3   virginica   virginica     Matching
44         3   virginica   virginica     Matching
```



```
 45          3   virginica   virginica     Matching
 46          3   virginica   virginica     Matching
 47          3   virginica   virginica     Matching
 48          3   virginica   virginica     Matching
 49          3   virginica   virginica     Matching
 50          3   virginica   virginica     Matching
 51          3   virginica   virginica     Matching
 52          3   virginica   virginica     Matching
 53          3   virginica   virginica     Matching
 54          3   virginica   virginica     Matching
 55          3   virginica   virginica     Matching
 56          3   virginica   virginica     Matching
 57          3   virginica   virginica     Matching
 58          3   virginica   virginica     Matching
 59          3   virginica   virginica     Matching
```



```
---------------- Confusion Matrix ------------------
      C1    C2    C3
C1  20.0   0.0   0.0
C2   0.0  18.0   2.0
C3   0.0   0.0  20.0


------------------- Accuracy -----------------------
Accuracy for Class 1: 1.0
Accuracy for Class 2: 0.9
Accuracy for Class 3: 1.0
Accuracy for whole network: 0.9666666666666667
```

Appendix

-- output be like --

1- test Result e.g. (Class ID for predicted class, predicted class, Actual class, Status[Matching, Mismatching])

2- Built confusion matrix (3x3)

3- Accuracy for 3 classes and whole network

-- problem in code --

when applying sigmoid function, it works will but when using hyperbolic something gonna wrong I do not know why? despite applying same steps used in sigmoid also I am sure, that output for coded tanh is correct and give the correct output so I do not know what to do honestly and the accuracy for whole network is 0.33 while using Sigmoid be > 0.90 as illustrated in screenshots.

-- Testcase used for outputs in screenshots --

hidden_layers : 2

neurons_number : 5 4

eta_value : 0.01

epochs_num : 1000

bias_decision : 1 (means use bias)

function_used : Sigmoid

space (“ “) is the splitter between neurons number

Regards.