**Neural Networks Report**

Task 2

|  |  |  |  |
| --- | --- | --- | --- |
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**Back-propagation**

**Back-Propagation learning algorithm** is a multi-layer neural networks, which can be able to classify a stream of input data to one of a set of predefined classes.

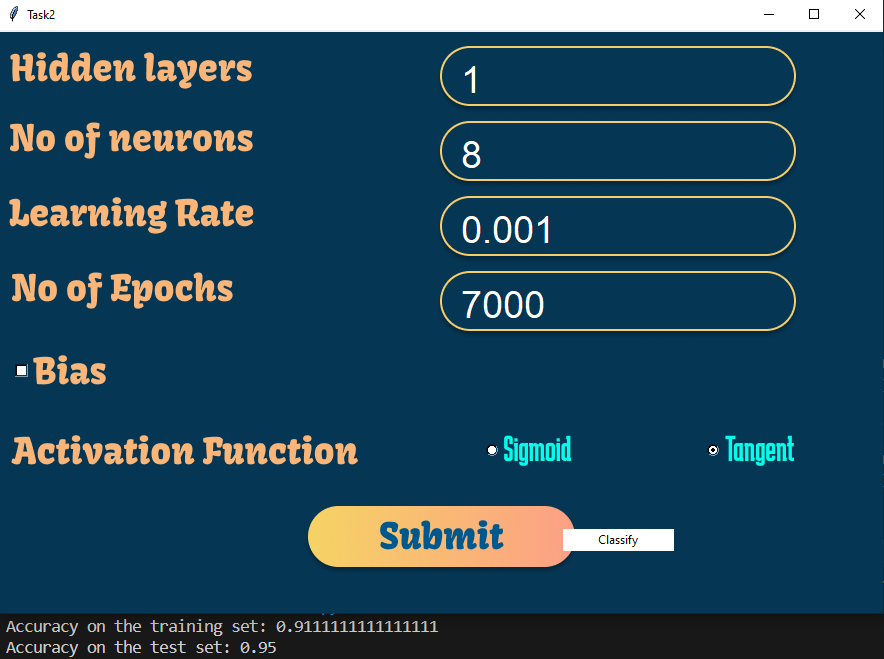
Using the dry beans data in both our training and testing processes. (Each class has 50 samples: train NN with the first 30 non-repeated samples, and test it with the remaining 20 samples).

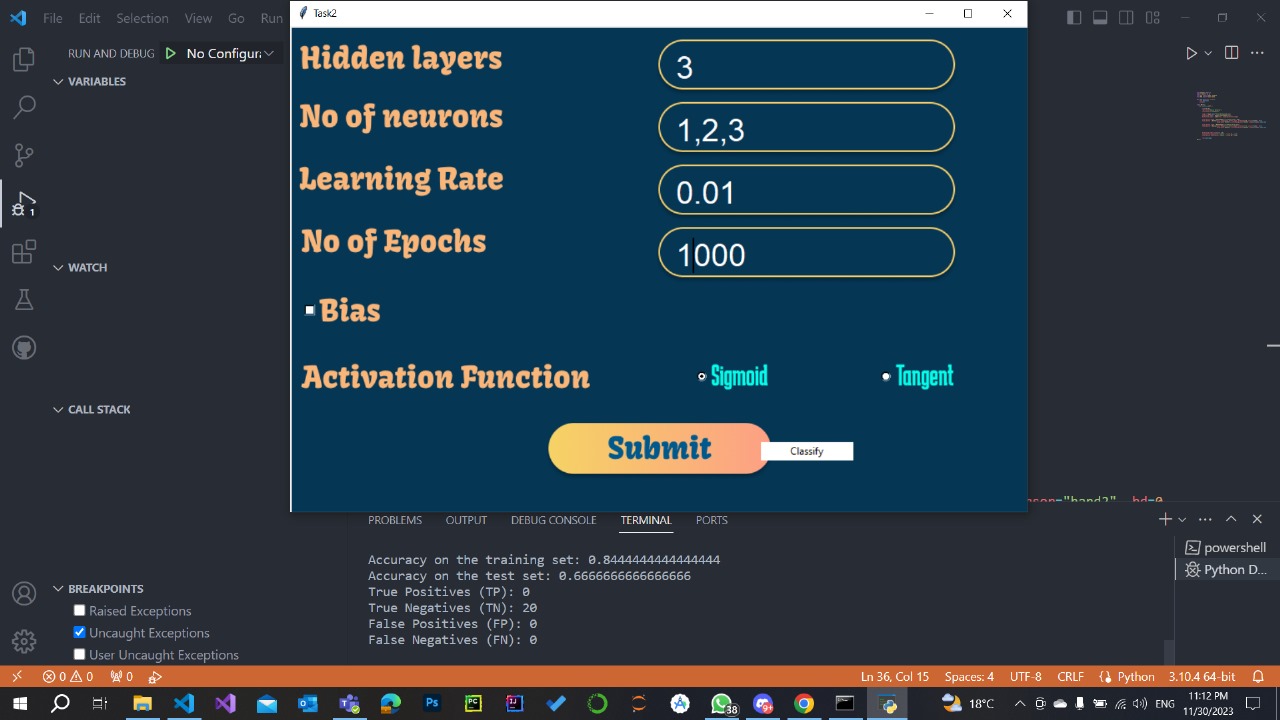
**Comparison**

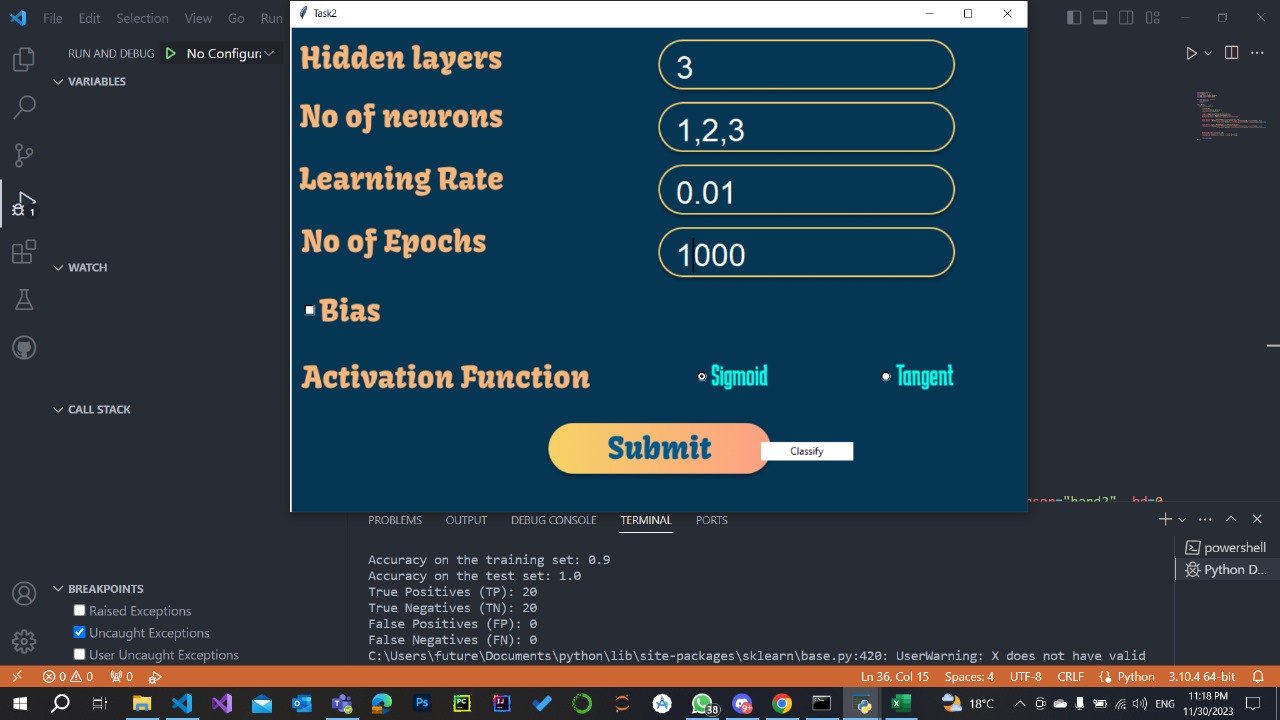
|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Activation Function | Train Accuracy | Test Accuracy | LR | Epochs | Layers | Neurons |
| Sigmoid | **90** | **100** | **0.01** | **100** | **3** | **1,2,3** |
| Tanh | **100** | **76** | **0.01** | **5000** | **1** | **5** |
| Sigmoid | **84** | **66** | **0.01** | **1000** | **3** | **1,2,3** |
| Tanh | **91** | **95** | **0.001** | **7000** | **1** | **8** |
| Sigmoid | **92** | **100** | **0.01** | **1000** | **2** | **1,5** |
| Tanh | **82** | **66** | **0.001** | **3000** | **3** | **1,5,8** |

**Conclusions**

**We reached the highest accuracy through our experiments as shown in the pictures**

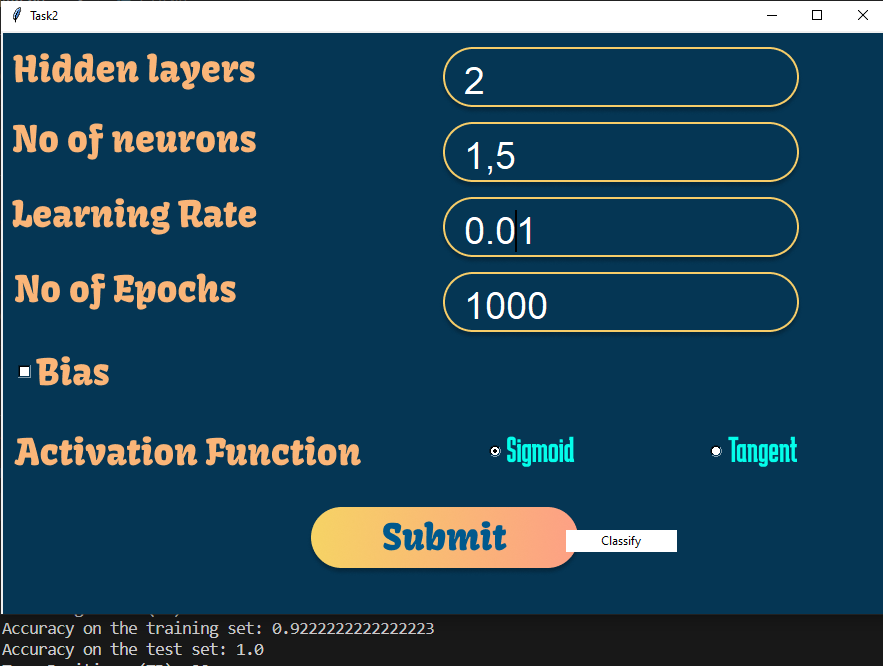
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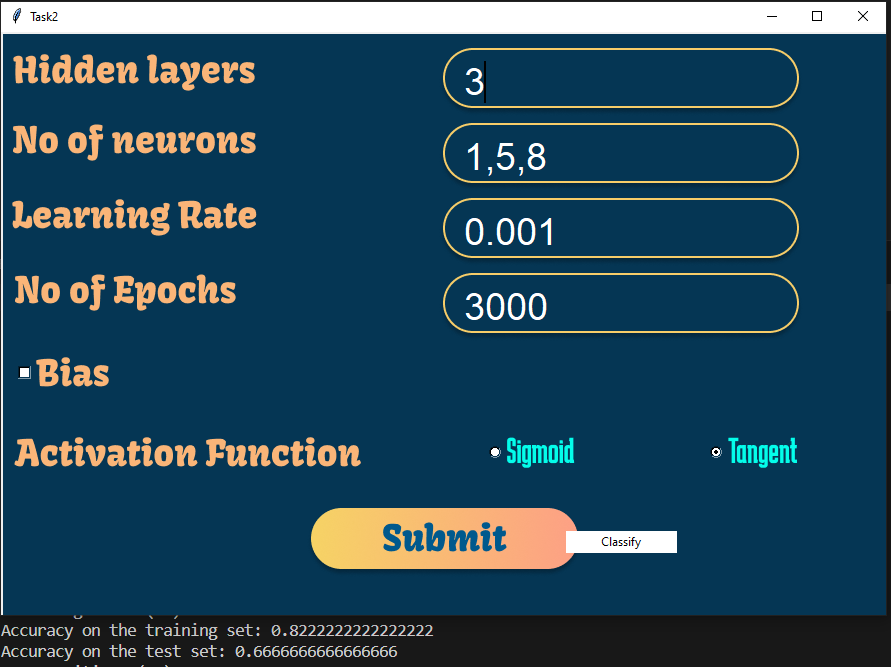
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**A screenshot of a computer

Description automatically generated**

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