**Assignment 1 Report**

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### Part 1: Japanese Character Recognition

1.Model Netlin

Required: Netlin model computes a linear function and of pixels in the image, followed by log softmax;

After 10 Epoch: the result figure shows below:

Final accuracy: 70%

Confusion matrix are shown below:

A screenshot of a computer

Description automatically generated

1.Model Netfull

Required: Implement a fully connected 2-layer network Netfull, using tanh at the hidden nodes and log softmax at the output node;

Choosing different values for the number of hidden nodes:

When we choose 10 nodes in the hidden layer:

After 10 Epoch: the result figure shows below:

Final accuracy: 69%

Confusion matrix are shown below:

A close up of text on a black background

Description automatically generated

When we choose 50 nodes in the hidden layer:

After 10 Epoch: the result figure shows below:

Final accuracy: 81%

Confusion matrix are shown below:

A picture containing table

Description automatically generated

When we choose 70 nodes in the hidden layer:

After 10 Epoch: the result figure shows below:

Final accuracy: 83%

Confusion matrix are shown below:

A screenshot of a computer

Description automatically generated

When we choose more than 70 nodes in the hidden layer, we could find that there is little change in final accuracy, so we choose 70 as our best number of hidden nodes.

### Part 2: Twin Spirals Task