**MLP Binary**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Epoch** | **h1** | **h2** | **nu** | **mu** | **test error** |
| 54 | 10 | 90 | 0.1 | 0.9 | 0.0849 |
| 12 | 90 | 10 | 0.1 | 0.9 | 0.0640 |
| 13 | 50 | 50 | 0.1 | 0.9 | 0.0475 |
| 36 | 50 | 50 | 0.1 | 0.1 | 0.0850 |
| 37 | 50 | 50 | 0.1 | 0.9 | 0.1167 |
| 2 | 50 | 50 | 0.9 | 0.9 | NaN |
| **47 (W = gauss)** | **50** | **50** | **0.1** | **0.1** | **0.0808** |
| 3 (W = 1) | 50 | 50 | 0.1 | 0.1 | 0.7005 |
| 3 (W = 0.1) | 50 | 50 | 0.1 | 0.1 | 0.6934 |

**zero\_one\_error\_test = 0.0244 – test error std: 0.0642**

**Linear Regression**

Test Error: 0.4763

v\* = 10

**Logistic Regression**

|  |  |  |  |
| --- | --- | --- | --- |
| **Epoch Count** | **nu** | **mu** | **test\_err** |
| 105 | 0.1 | 0.1 | 0.7280 |
| 114 | 0.1 | 0.9 | 0.5471 |
| 101 | 0.9 | 0.9 | 1.4077 |
| 92 (W gauss.) | 0.1 | 0.9 | 0.5623 |
| 41 (W gauss. var = 1/100n) | 0.1 | 0.9 | 0.5963 |
| **70(W = 0.1)** | **0.1** | **0.9** | **0.5577** |

**test\_err\_std = 0.0210**

**Multiway MLP**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Epoch** | **h1** | **h2** | **nu** | **mu** | **test error** |
| 65 | 10 | 90 | 0.1 | 0.9 | 0.2548 |
| 12 | 90 | 10 | 0.1 | 0.9 | NaN |
| 17 | 50 | 50 | 0.1 | 0.9 | 0.1359 |
| 3 | 50 | 50 | 0.1 | 0.1 | NaN |
| 29 | 50 | 50 | 0.1 | 0.9 | 0.1534 |
| 3 | 50 | 50 | 0.9 | 0.9 | NaN |
| 36 (var = 1/n) | 50 | 50 | 0.1 | 0.9 | 0.1398 |
| 3 (var = 1/2n) | 50 | 50 | 0.1 | 0.9 | 0.1322 |
| **3 (var = 1/100n)** | **50** | **50** | **0.1** | **0.9** | **0.1281** |

**test error std: 0.0059**

**MLP Multi Confusion Matrix for Chosen Model**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **0** | **1** | **2** | **3** | **4** |  |
| 974 | 73 | 31 | 0 | 2 | **0** |
| 156 | 917 | 1 | 0 | 6 | **1** |
| 264 | 10 | 691 | 12 | 103 | **2** |
| 3 | 0 | 1 | 1038 | 38 | **3** |
| 10 | 0 | 41 | 229 | 800 | **4** |