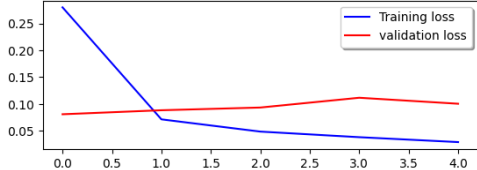
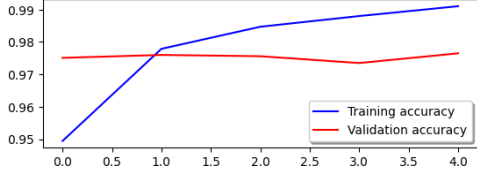


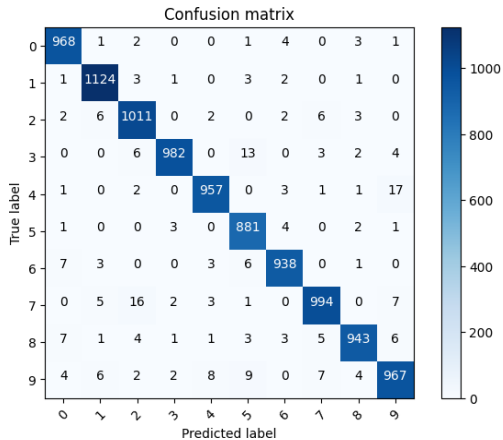
## Project Development Phase Model Performance Test

|               |  |
|---------------|--|
| Date          | 16 November 2022   |
| Team ID       | PNT2022TMID54114   |
| Project Name  | Project - A Novel Method For Handwritten Digit Recognition System. |
| Maximum Marks | 10 Marks   |

### Model Performance Testing:

Project team shall fill the following information in model performance testing template.

| S.No.             | Parameter          | Values  | Screenshot   |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
|-------------------|--------------------|---|--|--------------|---------------|-----------------|-----------------|--------------------|------|-------------------|--------------------|-------|-------------------|---------------|------|---------------|------------|--------|-----|------|------|-------|-------------------|---------------------|-----|------|-------|-----|------|-------|-----|-------|-------|-----|------|------|-----|------|-------|
| 1.                | Model Summary      |   | <div>Model: "sequential"</div> <table><thead><tr><th>Layer (type)</th><th>Output Shape</th><th>Param #</th></tr></thead><tbody><tr><td>conv2d (Conv2D)</td><td>(None, 26, 26, 64)</td><td>640</td></tr><tr><td>conv2d_1 (Conv2D)</td><td>(None, 24, 24, 32)</td><td>18464</td></tr><tr><td>flatten (Flatten)</td><td>(None, 18432)</td><td>0</td></tr><tr><td>dense (Dense)</td><td>(None, 10)</td><td>184330</td></tr></tbody></table> <div>=====</div> <div>Total params: 203,434</div> <div>Trainable params: 203,434</div> <div>Non-trainable params: 0</div> <div>=====</div> <div>None</div>   | Layer (type) | Output Shape  | Param #         | conv2d (Conv2D) | (None, 26, 26, 64) | 640  | conv2d_1 (Conv2D) | (None, 24, 24, 32) | 18464 | flatten (Flatten) | (None, 18432) | 0    | dense (Dense) | (None, 10) | 184330 |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
| Layer (type)      | Output Shape       | Param #   |  |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
| conv2d (Conv2D)   | (None, 26, 26, 64) | 640   |  |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
| conv2d_1 (Conv2D) | (None, 24, 24, 32) | 18464   |  |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
| flatten (Flatten) | (None, 18432)      | 0   |  |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
| dense (Dense)     | (None, 10)         | 184330  |  |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
| 2.                | Accuracy           | <div>Training Accuracy - 99%</div> <div>Validation Accuracy - 97%</div> | <div><table><caption>Loss Metrics</caption><thead><tr><th>Epoch</th><th>Training loss</th><th>validation loss</th></tr></thead><tbody><tr><td>0.0</td><td>0.25</td><td>0.08</td></tr><tr><td>1.0</td><td>0.08</td><td>0.09</td></tr><tr><td>2.0</td><td>0.05</td><td>0.09</td></tr><tr><td>3.0</td><td>0.04</td><td>0.11</td></tr><tr><td>4.0</td><td>0.03</td><td>0.10</td></tr></tbody></table></div> <div><table><caption>Accuracy Metrics</caption><thead><tr><th>Epoch</th><th>Training accuracy</th><th>Validation accuracy</th></tr></thead><tbody><tr><td>0.0</td><td>0.95</td><td>0.975</td></tr><tr><td>1.0</td><td>0.98</td><td>0.975</td></tr><tr><td>2.0</td><td>0.985</td><td>0.975</td></tr><tr><td>3.0</td><td>0.99</td><td>0.97</td></tr><tr><td>4.0</td><td>0.99</td><td>0.975</td></tr></tbody></table></div> | Epoch        | Training loss | validation loss | 0.0             | 0.25               | 0.08 | 1.0               | 0.08               | 0.09  | 2.0               | 0.05          | 0.09 | 3.0           | 0.04       | 0.11   | 4.0 | 0.03 | 0.10 | Epoch | Training accuracy | Validation accuracy | 0.0 | 0.95 | 0.975 | 1.0 | 0.98 | 0.975 | 2.0 | 0.985 | 0.975 | 3.0 | 0.99 | 0.97 | 4.0 | 0.99 | 0.975 |
| Epoch             | Training loss      | validation loss   |  |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
| 0.0               | 0.25               | 0.08  |  |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
| 1.0               | 0.08               | 0.09  |  |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
| 2.0               | 0.05               | 0.09  |  |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
| 3.0               | 0.04               | 0.11  |  |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
| 4.0               | 0.03               | 0.10  |  |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
| Epoch             | Training accuracy  | Validation accuracy   |  |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
| 0.0               | 0.95               | 0.975   |  |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
| 1.0               | 0.98               | 0.975   |  |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
| 2.0               | 0.985              | 0.975   |  |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
| 3.0               | 0.99               | 0.97  |  |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |
| 4.0               | 0.99               | 0.975   |  |              |               |                 |                 |                    |      |                   |                    |       |                   |               |      |               |            |        |     |      |      |       |                   |                     |     |      |       |     |      |       |     |       |       |     |      |      |     |      |       |

| 3.                           | Confusion Matrix      |  <table><caption>Confusion matrix</caption><tr><th>True label \ Predicted label</th><th>0</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th></tr><tr><th>0</th><td>968</td><td>1</td><td>2</td><td>0</td><td>0</td><td>1</td><td>4</td><td>0</td><td>3</td><td>1</td></tr><tr><th>1</th><td>1</td><td>1124</td><td>3</td><td>1</td><td>0</td><td>3</td><td>2</td><td>0</td><td>1</td><td>0</td></tr><tr><th>2</th><td>2</td><td>6</td><td>1011</td><td>0</td><td>2</td><td>0</td><td>2</td><td>6</td><td>3</td><td>0</td></tr><tr><th>3</th><td>0</td><td>0</td><td>6</td><td>982</td><td>0</td><td>13</td><td>0</td><td>3</td><td>2</td><td>4</td></tr><tr><th>4</th><td>1</td><td>0</td><td>2</td><td>0</td><td>957</td><td>0</td><td>3</td><td>1</td><td>1</td><td>17</td></tr><tr><th>5</th><td>1</td><td>0</td><td>0</td><td>3</td><td>0</td><td>881</td><td>4</td><td>0</td><td>2</td><td>1</td></tr><tr><th>6</th><td>7</td><td>3</td><td>0</td><td>0</td><td>3</td><td>6</td><td>938</td><td>0</td><td>1</td><td>0</td></tr><tr><th>7</th><td>0</td><td>5</td><td>16</td><td>2</td><td>3</td><td>1</td><td>0</td><td>994</td><td>0</td><td>7</td></tr><tr><th>8</th><td>7</td><td>1</td><td>4</td><td>1</td><td>1</td><td>3</td><td>3</td><td>5</td><td>943</td><td>6</td></tr><tr><th>9</th><td>4</td><td>6</td><td>2</td><td>2</td><td>8</td><td>9</td><td>0</td><td>7</td><td>4</td><td>967</td></tr></table> | True label \ Predicted label | 0         | 1      | 2        | 3       | 4   | 5    | 6    | 7    | 8   | 9 | 0    | 968  | 1    | 2    | 0 | 0    | 1    | 4    | 0    | 3 | 1    | 1    | 1    | 1124 | 3 | 1    | 0    | 3    | 2   | 0 | 1    | 0    | 2    | 2   | 6 | 1011 | 0    | 2    | 0   | 2 | 6    | 3    | 0    | 3    | 0 | 0    | 6    | 982  | 0   | 13 | 0    | 3    | 2    | 4    | 4        | 1 | 0 | 2    | 0     | 957       | 0    | 3    | 1    | 1     | 17           | 5    | 1    | 0    | 0     | 3 | 0 | 881 | 4 | 0 | 2 | 1 | 6 | 7 | 3 | 0 | 0 | 3 | 6 | 938 | 0 | 1 | 0 | 7 | 0 | 5 | 16 | 2 | 3 | 1 | 0 | 994 | 0 | 7 | 8 | 7 | 1 | 4 | 1 | 1 | 3 | 3 | 5 | 943 | 6 | 9 | 4 | 6 | 2 | 2 | 8 | 9 | 0 | 7 | 4 | 967 |
|------------------------------|-----------------------|--|------------------------------|-----------|--------|----------|---------|-----|------|------|------|-----|---|------|------|------|------|---|------|------|------|------|---|------|------|------|------|---|------|------|------|-----|---|------|------|------|-----|---|------|------|------|-----|---|------|------|------|------|---|------|------|------|-----|----|------|------|------|------|----------|---|---|------|-------|-----------|------|------|------|-------|--------------|------|------|------|-------|---|---|-----|---|---|---|---|---|---|---|---|---|---|---|-----|---|---|---|---|---|---|----|---|---|---|---|-----|---|---|---|---|---|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|---|---|---|-----|
| True label \ Predicted label | 0                     | 1  | 2                            | 3         | 4      | 5        | 6       | 7   | 8    | 9    |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 0                            | 968                   | 1  | 2                            | 0         | 0      | 1        | 4       | 0   | 3    | 1    |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 1                            | 1                     | 1124   | 3                            | 1         | 0      | 3        | 2       | 0   | 1    | 0    |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 2                            | 2                     | 6  | 1011                         | 0         | 2      | 0        | 2       | 6   | 3    | 0    |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 3                            | 0                     | 0  | 6                            | 982       | 0      | 13       | 0       | 3   | 2    | 4    |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 4                            | 1                     | 0  | 2                            | 0         | 957    | 0        | 3       | 1   | 1    | 17   |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 5                            | 1                     | 0  | 0                            | 3         | 0      | 881      | 4       | 0   | 2    | 1    |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 6                            | 7                     | 3  | 0                            | 0         | 3      | 6        | 938     | 0   | 1    | 0    |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 7                            | 0                     | 5  | 16                           | 2         | 3      | 1        | 0       | 994 | 0    | 7    |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 8                            | 7                     | 1  | 4                            | 1         | 1      | 3        | 3       | 5   | 943  | 6    |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 9                            | 4                     | 6  | 2                            | 2         | 8      | 9        | 0       | 7   | 4    | 967  |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 4.                           | Classification Report | <table><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr><tr><td>0</td><td>0.98</td><td>0.99</td><td>0.98</td><td>980</td></tr><tr><td>1</td><td>0.98</td><td>0.99</td><td>0.99</td><td>1135</td></tr><tr><td>2</td><td>0.97</td><td>0.98</td><td>0.97</td><td>1032</td></tr><tr><td>3</td><td>0.99</td><td>0.97</td><td>0.98</td><td>1010</td></tr><tr><td>4</td><td>0.98</td><td>0.97</td><td>0.98</td><td>982</td></tr><tr><td>5</td><td>0.96</td><td>0.99</td><td>0.97</td><td>892</td></tr><tr><td>6</td><td>0.98</td><td>0.98</td><td>0.98</td><td>958</td></tr><tr><td>7</td><td>0.98</td><td>0.97</td><td>0.97</td><td>1028</td></tr><tr><td>8</td><td>0.98</td><td>0.97</td><td>0.98</td><td>974</td></tr><tr><td>9</td><td>0.96</td><td>0.96</td><td>0.96</td><td>1009</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.98</td><td>10000</td></tr><tr><td>macro avg</td><td>0.98</td><td>0.98</td><td>0.98</td><td>10000</td></tr><tr><td>weighted avg</td><td>0.98</td><td>0.98</td><td>0.98</td><td>10000</td></tr></table>   |                              | precision | recall | f1-score | support | 0   | 0.98 | 0.99 | 0.98 | 980 | 1 | 0.98 | 0.99 | 0.99 | 1135 | 2 | 0.97 | 0.98 | 0.97 | 1032 | 3 | 0.99 | 0.97 | 0.98 | 1010 | 4 | 0.98 | 0.97 | 0.98 | 982 | 5 | 0.96 | 0.99 | 0.97 | 892 | 6 | 0.98 | 0.98 | 0.98 | 958 | 7 | 0.98 | 0.97 | 0.97 | 1028 | 8 | 0.98 | 0.97 | 0.98 | 974 | 9  | 0.96 | 0.96 | 0.96 | 1009 | accuracy |   |   | 0.98 | 10000 | macro avg | 0.98 | 0.98 | 0.98 | 10000 | weighted avg | 0.98 | 0.98 | 0.98 | 10000 |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
|                              | precision             | recall   | f1-score                     | support   |        |          |         |     |      |      |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 0                            | 0.98                  | 0.99   | 0.98                         | 980       |        |          |         |     |      |      |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 1                            | 0.98                  | 0.99   | 0.99                         | 1135      |        |          |         |     |      |      |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 2                            | 0.97                  | 0.98   | 0.97                         | 1032      |        |          |         |     |      |      |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 3                            | 0.99                  | 0.97   | 0.98                         | 1010      |        |          |         |     |      |      |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 4                            | 0.98                  | 0.97   | 0.98                         | 982       |        |          |         |     |      |      |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 5                            | 0.96                  | 0.99   | 0.97                         | 892       |        |          |         |     |      |      |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 6                            | 0.98                  | 0.98   | 0.98                         | 958       |        |          |         |     |      |      |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 7                            | 0.98                  | 0.97   | 0.97                         | 1028      |        |          |         |     |      |      |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 8                            | 0.98                  | 0.97   | 0.98                         | 974       |        |          |         |     |      |      |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| 9                            | 0.96                  | 0.96   | 0.96                         | 1009      |        |          |         |     |      |      |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| accuracy                     |                       |  | 0.98                         | 10000     |        |          |         |     |      |      |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| macro avg                    | 0.98                  | 0.98   | 0.98                         | 10000     |        |          |         |     |      |      |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |
| weighted avg                 | 0.98                  | 0.98   | 0.98                         | 10000     |        |          |         |     |      |      |      |     |   |      |      |      |      |   |      |      |      |      |   |      |      |      |      |   |      |      |      |     |   |      |      |      |     |   |      |      |      |     |   |      |      |      |      |   |      |      |      |     |    |      |      |      |      |          |   |   |      |       |           |      |      |      |       |              |      |      |      |       |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |    |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |     |