**Project Development Phase**

**Model Performance Test**

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| Date | 10 February 2025 |
| Team ID | LTVIP2025TMID38289 |
| Project Name | Classifying Fabric Patterns Using Deep-Learning |
| Maximum Marks |  |

**PROJECT DEVELOPMENT PHASE**

**Model Performance Testing (Detailed Table)**

**Objective:** Evaluate the deep learning model’s performance on different metrics to ensure reliable fabric pattern classification.

1. Model Performance Test Table:

| **Metric** | **Description** |  | **Test Result (Example)** | **Interpretation** |
| --- | --- | --- | --- | --- |
| **Accuracy** | Percentage of correctly classified patterns out of total predictions |  | 91.6% | High accuracy indicates the model is performing well across all classes. |
| **Precision (Avg)** | Measure of exactness – how many selected items are relevant |  | 92.4% | High precision means fewer false positives per class. |
| **Recall (Avg)** | Measure of completeness – how many relevant items were selected |  | 90.8% | High recall means most actual patterns were correctly identified. |
| **F1 Score (Avg)** | Harmonic mean of precision and recall |  | 91.6% | Balanced view between precision and recall – good performance overall. |
| **Top-1 Accuracy** | % of times the correct class is the top prediction |  | 91.6% | Most often the correct class is predicted first. |
| **Top-3 Accuracy** | % of times the correct class is within the top 3 predictions |  | 98.2% | Useful in recommendation or search-based systems. |
| **Training Time** | Total time taken to train the model on the dataset |  | 1.5 hours | Indicates resource efficiency. |
| **Validation Accuracy** | Accuracy on unseen validation set during training |  | 90.2% | Close to test accuracy – shows good generalization. |
| **Test Accuracy** | Final evaluation on held-out test dataset |  | 91.6% | Reflects real-world performance. |
| **Loss (Cross Entropy)** | The average prediction error during training/testing |  | 0.22 | Lower loss means the model has learned well. |
| **Confusion Matrix** | Matrix of actual vs. predicted class distributions |  | [CM Placeholder] | Reveals per-class strengths/weaknesses and misclassifications. |
| **Class-wise Accuracy** | Accuracy of the model on each fabric pattern class |  | See class table below | Helps identify which patterns need improvement. |

| **2. Class-wise Accuracy (Example):**  **Pattern Class** | **Class Label** | **Accuracy (%)** |
| --- | --- | --- |
| Floral | 0 | 95.2 |
| Geometric | 1 | 89.3 |
| Stripes | 2 | 88.7 |
| Plaid | 3 | 93.1 |
| Abstract | 4 | 90.8 |
| Dotted | 5 | 85.4 |
| Plain | 6 | 92.7 |
| Animal Print | 7 | 87.6 |
| Paisley | 8 | 91.9 |
| Ikat | 9 | 90.4 |