**Thresholding Table:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Threshold** | **Accuracy** | **Precision** | **Recall** | **F1** | **ROC-AUC** |
| **0.100** | **0.971** | **0.919** | **1.000** | **0.958** | **0.996** |
| **0.200** | **0.971** | **0.933** | **0.982** | **0.957** | **0.996** |
| **0.300** | **0.971** | **0.933** | **0.982** | **0.957** | **0.996** |
| **0.400** | **0.960** | **0.931** | **0.947** | **0.939** | **0.996** |
| **0.500** | **0.960** | **0.946** | **0.930** | **0.938** | **0.996** |
| **0.600** | **0.966** | **0.964** | **0.930** | **0.946** | **0.996** |
| **0.700** | **0.966** | **0.964** | **0.930** | **0.946** | **0.996** |
| **0.800** | **0.949** | **0.962** | **0.877** | **0.917** | **0.996** |
| **0.900** | **0.920** | **0.978** | **0.772** | **0.863** | **0.996** |

**Optimum Threshold (max F1): 0.1 with F1: 0.958**

**Accuracy: 0.971**

**F1 Score: 0.958**

**ROC-AUC: 0.996**

**Confusion Matrix (Custom Threshold 0.1):**

|  |  |  |
| --- | --- | --- |
|  | **Predicted 0** | **Predicted 1** |
| **Actual 0** | **113** | **5** |
| **Actual 1** | **0** | **57** |

**SHAP & Permutation Feature Importance (F1):**

|  |  |  |  |
| --- | --- | --- | --- |
| **Feature** | **SHAP** | **Importance Mean** | **Importance Std** |
| **1** | **0.749** | **0.031** | **0.015** |
| **2** | **0.246** | **-0.000** | **0.004** |
| **3** | **0.754** | **0.027** | **0.009** |
| **4** | **0.534** | **0.052** | **0.013** |
| **5** | **0.199** | **-0.005** | **0.004** |
| **6** | **1.094** | **0.134** | **0.014** |
| **7** | **0.401** | **0.003** | **0.014** |
| **8** | **0.329** | **0.008** | **0.006** |
| **9** | **0.191** | **0.003** | **0.005** |