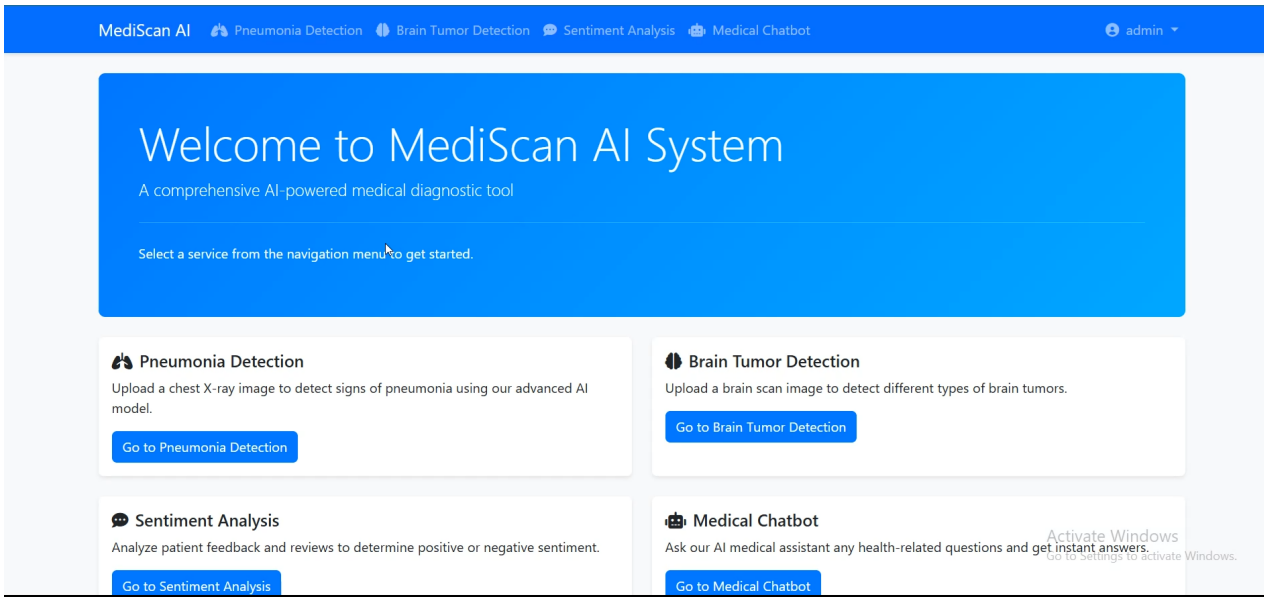
MediScan AI

This web app is designed to provide an accurate classification for brain tumor detection and classification, Pneumonia, sentiment analysis for feedback, and medical chatbot.

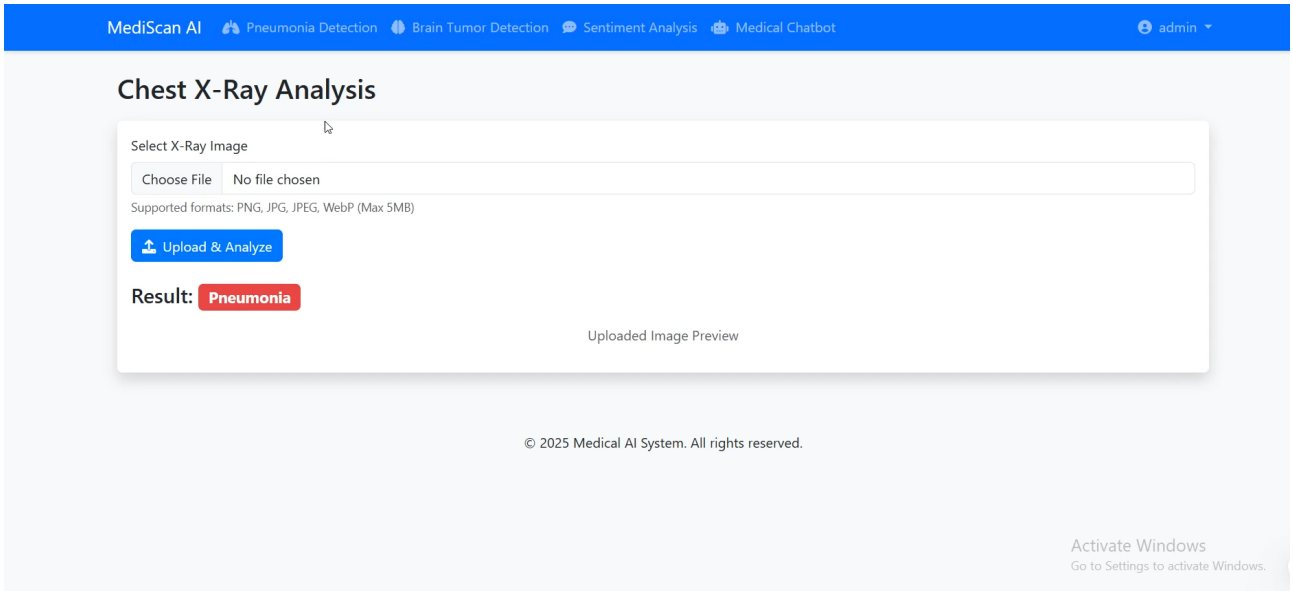
The website’s layout is divided into four sections; Pneumonia detection, Brain tumor detection, chatbot powered by Qwen 1.8b LLM implemented using Ollama, and sentiment analysis using LSTM.

For the Pneumonia detection, user is to provide an X-ray scan image for the web app. In the backend, the trained model first preprocesses the image followed by image analysis and the result of the classification is provided for the user.

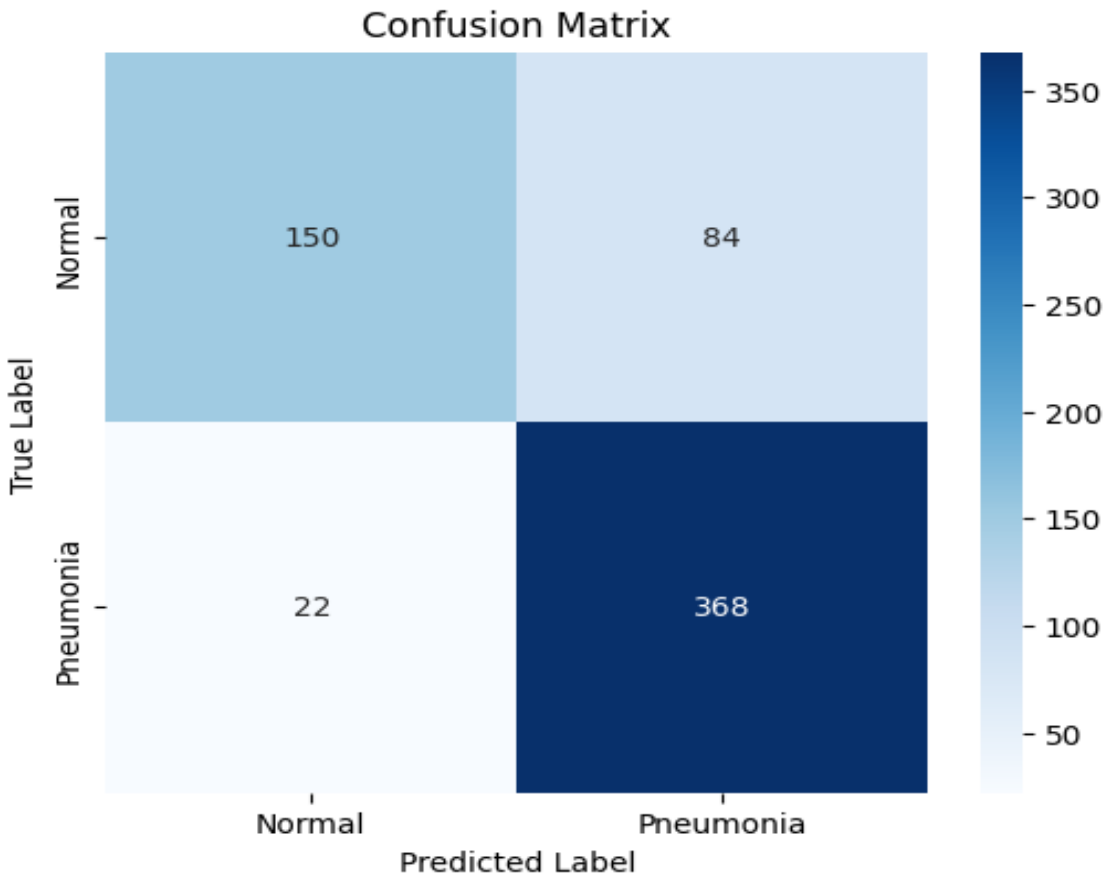


Pneumonia Detection

For this model, a dataset of 5,800 X-ray images of normal and case scans. A DenseNet model is implemented as the core image analysis. The model achieved accuracy of 88%.

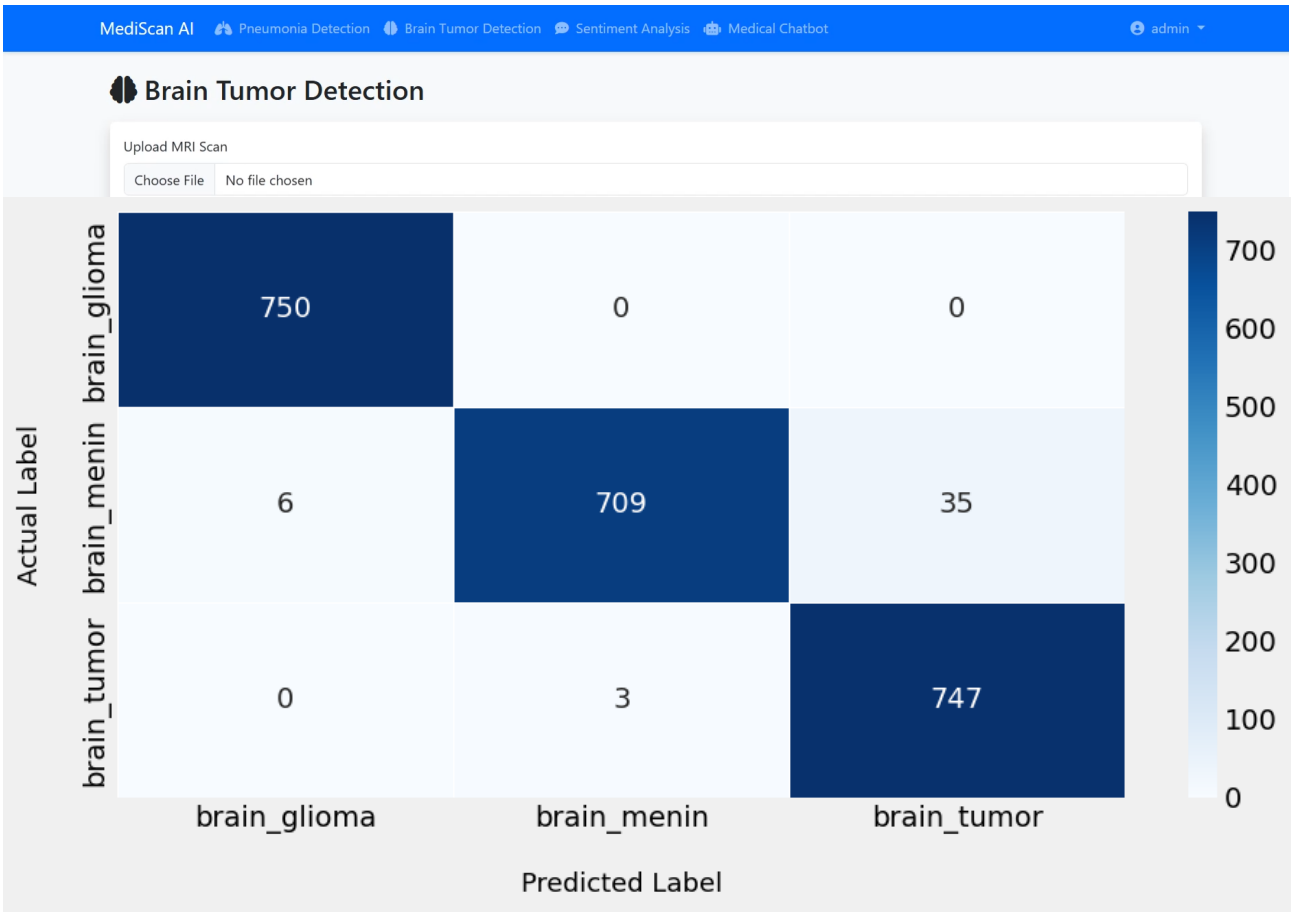


	precision	recall	f1-score	support
0	0.86	0.82	0.84	234
1	0.90	0.92	0.91	390
accuracy			0.88	624
macro avg	0.88	0.87	0.87	624
weighted avg	0.88	0.88	0.88	624



Brain Tumor Classification

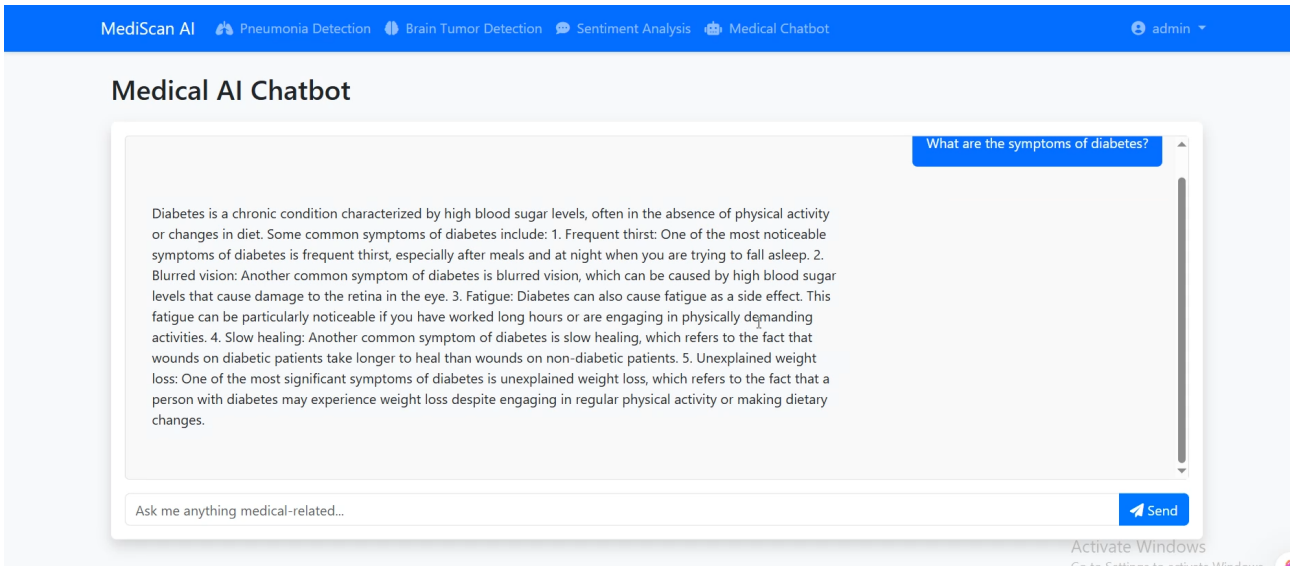
For brain tumor classification, an MRI scan of the brain is provided, the classification is done using a model trained on 5000 images for three classes: Brain Glioma, Brain Menin, and Brain Tumors. The model has accuracy of 93% utilizing the transfer learning of the EfficientNet models.

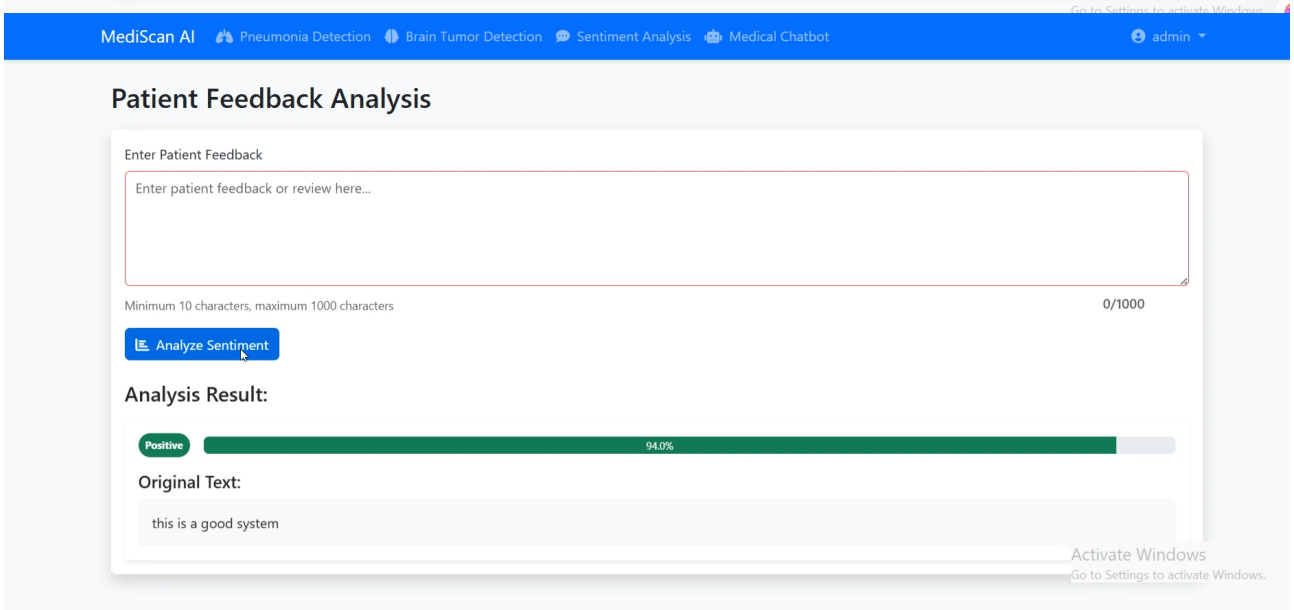


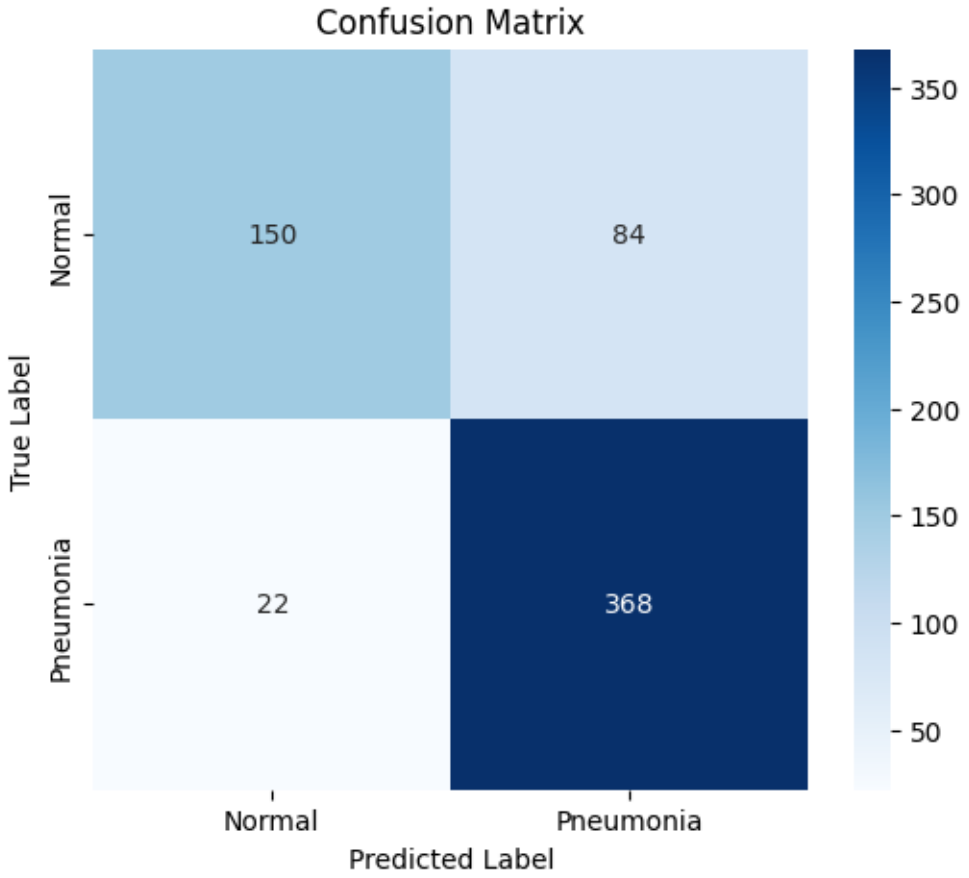
	precision	recall	f1-score	support
brain_glioma	0.99	1.00	1.00	750
brain_menin	1.00	0.95	0.97	750
brain_tumor	0.96	1.00	0.98	750
accuracy			0.98	2250
macro avg	0.98	0.98	0.98	2250
weighted avg	0.98	0.98	0.98	2250

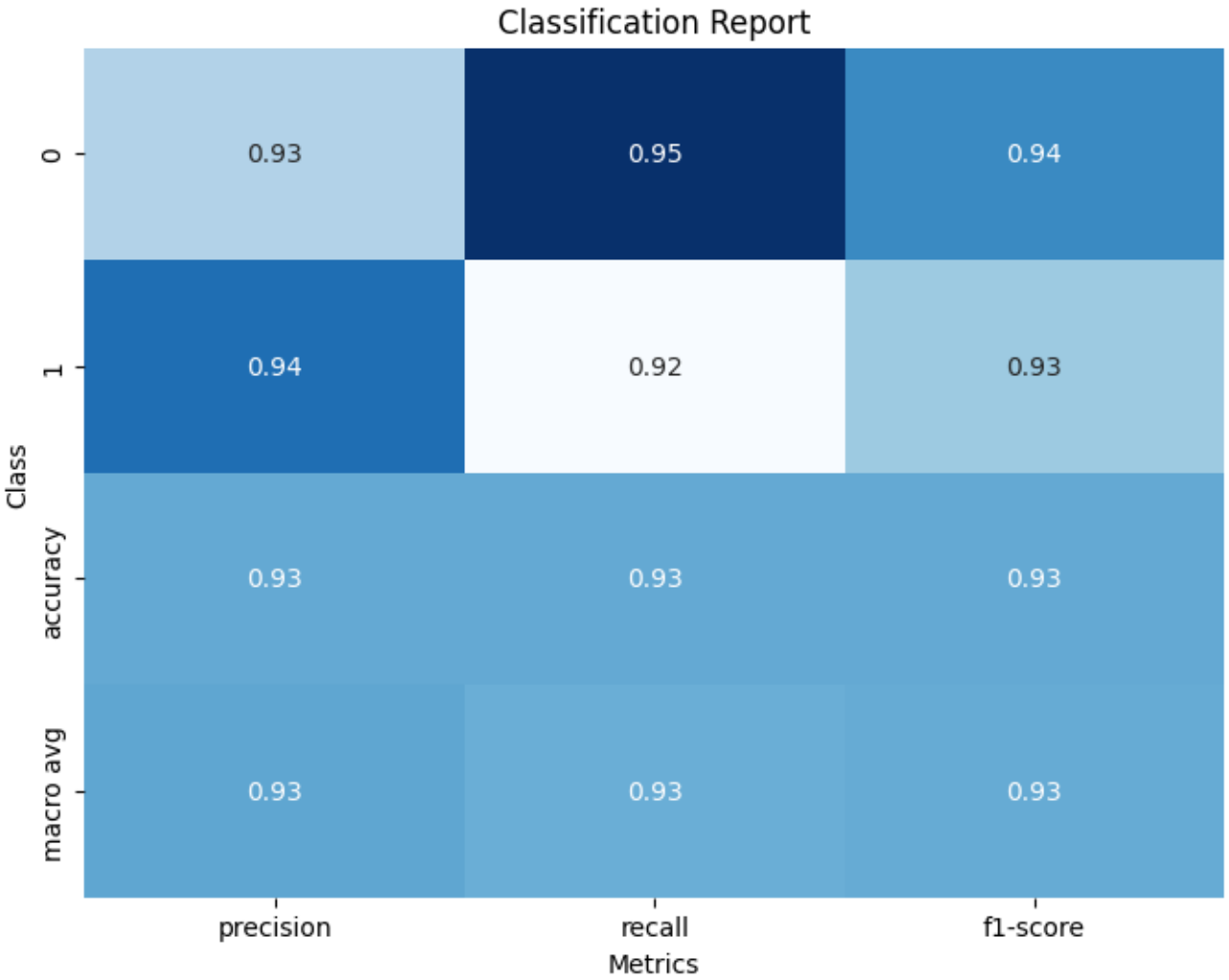
Medical Chatbot & Sentiment Analysis

For medical information, we used Qwen LLM powered chatbot to provide general information regarding topic of interest. We also used LSTM for sentiment analysis of medical reports.






Confusion Matrix
Normal
Pneumonia
True Label
150
84
22
368
350
300
250
200
150
100
50
Normal
Pneumonia
Predicted Label


Classification Report
Class
0
1
accuracy
macro avg
0.93
0.95
0.94
0.94
0.92
0.93
0.93
0.93
0.93
0.93
0.93
0.93
precision
recall
f1-score
Metrics