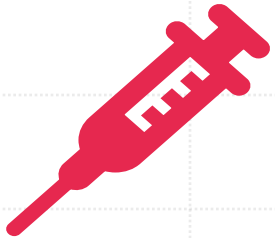


SYMPTOM BASED DISEASE PREDICTION

TEAM MEMBERS:

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- OAM CHANDRA LAASYA
TUMMALA
- RAKESH REDDY

INTRODUCTION



Project Objective:

Build a predictive system for preliminary diagnosis and preventive measures using symptom data.

Integrate LSTM, ANN, and Feed-Forward neural networks to classify diseases based on user-reported symptoms.



Problem Statement:

Symptom progression prediction for early diagnosis and prevention.

Risk assessment and advice on precautions.

DATASET OVERVIEW

DATASET	DESCRIPTION	PURPOSE
DATASET.CSV	4900 rows of data which contains disease and the followed symptoms ranging from 1-17	Train and validate the LSTM model to recognize symptom patterns
SYMPTOM_SEVERITY.CSV	Severity cores associated with symptoms, useful for weighting risk	Enhance diagnostic accuracy and assess urgency
SYMPTOM_DESCRIPTION.CSV	Description of potential conditions associated with symptoms	Provide informative response and aid in user understanding
SYMPTOM_PRECAUTION.CSV	Preventive measures linked to various symptoms and conditions	Offer precautionary advice post-diagnosis



METHODOLOGY

01

Data Preprocessing:

- Tokenization and padding of symptom text.
- Label encoding for disease categories.

02

Training Process:

- Split dataset into training and test sets (80%/20%).

03

Model Architecture:

- Sequential models with LSTM, ANN, and Feed-Forward architectures.
- Regularization techniques (L2 regularization, Dropout) to prevent overfitting.

MODEL1: SIMPLE FEED FORWARD NETWORK

Model: "sequential_2"

Layer (type)	Output Shape	Param #
dense_5 (Dense)	(None, 128)	512
dropout_4 (Dropout)	(None, 128)	0
dense_6 (Dense)	(None, 64)	8,256
dropout_5 (Dropout)	(None, 64)	0
dense_7 (Dense)	(None, 32)	2,080
dense_8 (Dense)	(None, 41)	1,353

MODEL 2: LSTM

Model: "sequential"

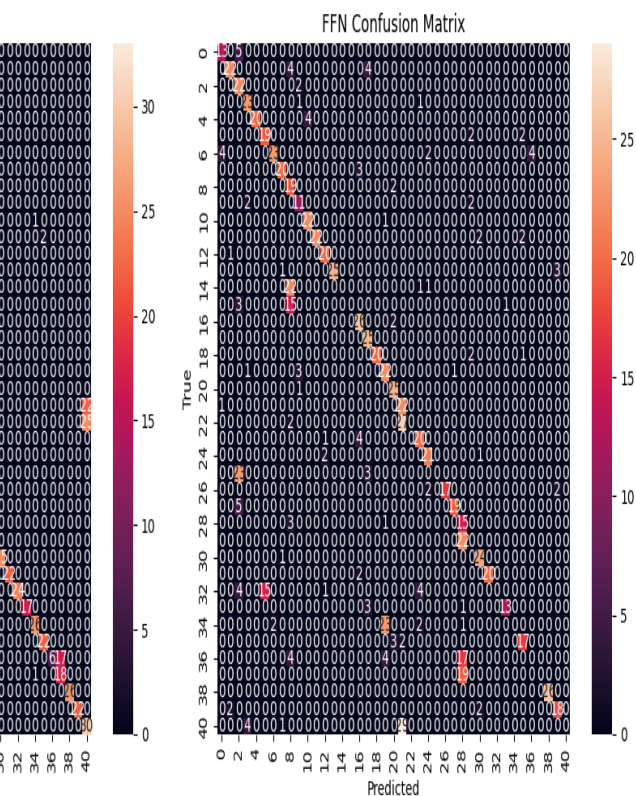
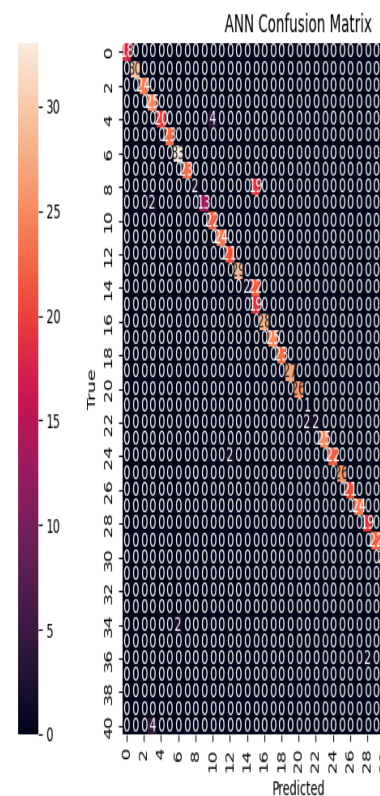
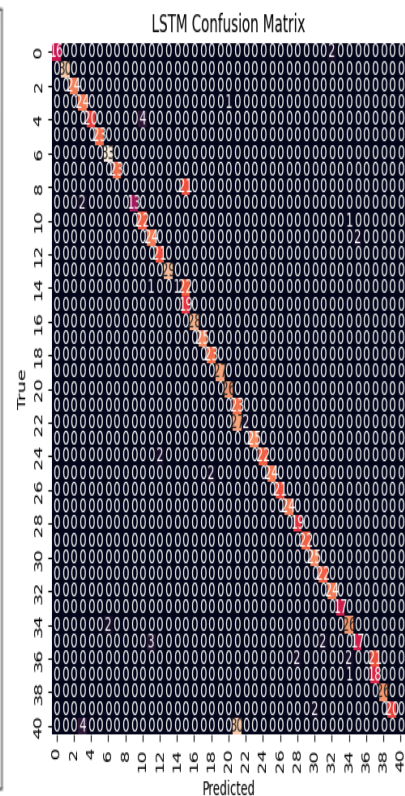
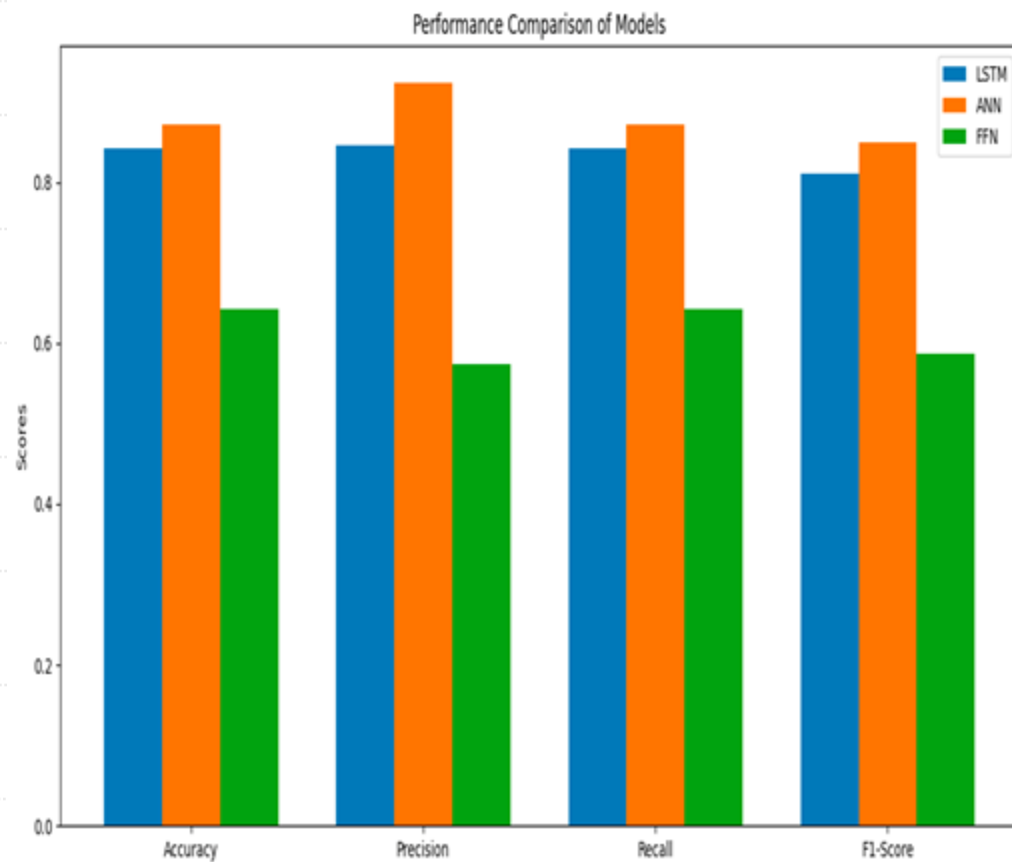
Layer (type)	Output Shape	Param #
embedding (Embedding)	(None, 3, 100)	100,000
lstm (LSTM)	(None, 3, 128)	117,248
dropout (Dropout)	(None, 3, 128)	0
lstm_1 (LSTM)	(None, 64)	49,408
dropout_1 (Dropout)	(None, 64)	0
dense (Dense)	(None, 32)	2,080
dense_1 (Dense)	(None, 41)	1,353

MODEL 3: ANN

Model: "sequential_1"

Layer (type)	Output Shape	Param #
embedding_1 (Embedding)	(None, 3, 100)	100,000
flatten (Flatten)	(None, 300)	0
dense_2 (Dense)	(None, 128)	38,528
dropout_2 (Dropout)	(None, 128)	0
dense_3 (Dense)	(None, 64)	8,256
dropout_3 (Dropout)	(None, 64)	0
dense_4 (Dense)	(None, 41)	2,665

PERFORMANCE METRICS



PERFORMANCE METRICS

Model	Accuracy	Precision	Recall	F1-Score	ROC-AUC
LSTM	0.8577	0.9006	0.8577	0.8323	0.9958
ANN	0.8689	0.9237	0.8689	0.8442	0.9960
FFN	0.6209	0.5218	0.6209	0.5482	0.9581

REAL-TIME APPLICATION

=====

🖨 Welcome to the Interactive Medical Symptom Analysis System!

=====

Hello Laasya! 🌟 I'm your medical assistant chatbot.

Before we begin, please note:

- 1 This system is for educational purposes only
- 2 Always consult healthcare professionals for medical advice
- 3 In case of emergency, call emergency services immediately

📄 How to Use This System:

1. You can either describe your symptoms or choose from our list
2. The system will analyze your symptoms and suggest possible conditions
3. Follow-up questions will help refine the diagnosis
4. You can view detailed information about conditions

⚠ Important: If you experience severe symptoms, seek immediate medical attention or call emergency services.

=====

🖨 Medical Assistant - Laasya's Session

=====

📄 Menu Options:

1. Describe your symptoms
2. Browse symptom catalog
3. View your current symptoms
4. Emergency information
5. Help & Instructions

🔍 Symptom Analysis

Enter your symptoms one by one (type 'done' when finished):

Tip: You can type part of the symptom name and we'll help you find it

Final list of symptoms:

1. body pains
2. vomiting
3. indigestion

⚠ No close match found for: body pains

✅ Symptoms matched successfully:

- vomiting
- indigestion

📄 Diagnosis Results:

=====

🔍 Possible Condition: GERD

📊 Confidence Level: 34.2%

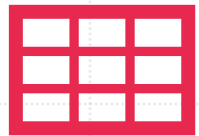
📄 Description:

Gastroesophageal reflux disease, or GERD, is a digestive disorder that affects the lower esophageal sphincter (

⚠ Recommended Precautions:

1. avoid fatty spicy food
2. avoid lying down after eating
3. maintain healthy weight
4. exercise

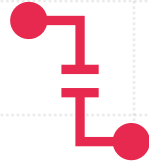
CHALLENGES



Data Challenges:

Text-based input with variations in symptom descriptions.

Small dataset size (4900 rows).



Model Challenges:

Overfitting due to small dataset.

Balancing between model complexity and generalization.



Performance Challenges:

Ensuring a robust model with consistent predictions across different classes.



FUTURE SCOPE

Improvement of Data:

- Expand the dataset with more user reports to improve generalization.

Model Enhancements:

- Experiment with Transformer models like BERT for symptom classification.

User Interaction:

- Implement real-time symptom tracking and progression prediction in a chatbot interface.

Precautionary Recommendations:

- Implement more personalized, dynamic precautionary advice based on model predictions.

ANY
QUESTIONS?



THANK YOU

