

PROJECT 3

Symptom-Based Disease Prediction and Prescription Recommendation Using Deep Learning

Submitted By :

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Project Report: Deep Learning for Disease Prediction

1. Project Overview

This project implements a deep learning model to analyze patient-reported symptoms and predict potential diseases along with corresponding prescriptions.

2. Objectives

- Predict diseases based on patients' symptom descriptions.
- Recommend appropriate prescriptions or treatments.
- Preprocess medical text data for deep learning compatibility.
- Train a multi-output LSTM model for classification.

3. Tools and Technologies Used

Programming Language:

- Python

Libraries and Frameworks:

- Pandas & NumPy
- TensorFlow & Keras
- Sklearn (LabelEncoder)
- Keras Tokenizer & pad_sequences

4. Dataset and Preprocessing

Data Source: `medical_data.csv` with `Patient_Problem`, `Disease`, and `Prescription` columns.

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Steps:

- Tokenization and padding
- Label encoding and one-hot conversion

5. Model Architecture

The model uses a shared embedding and LSTM encoder with two output branches.

Layers:

- Embedding -> LSTM -> Dense (Disease) & Dense (Prescription)

Outputs are predicted using softmax activation.

6. Training & Evaluation

Loss Functions: Categorical Crossentropy for both outputs

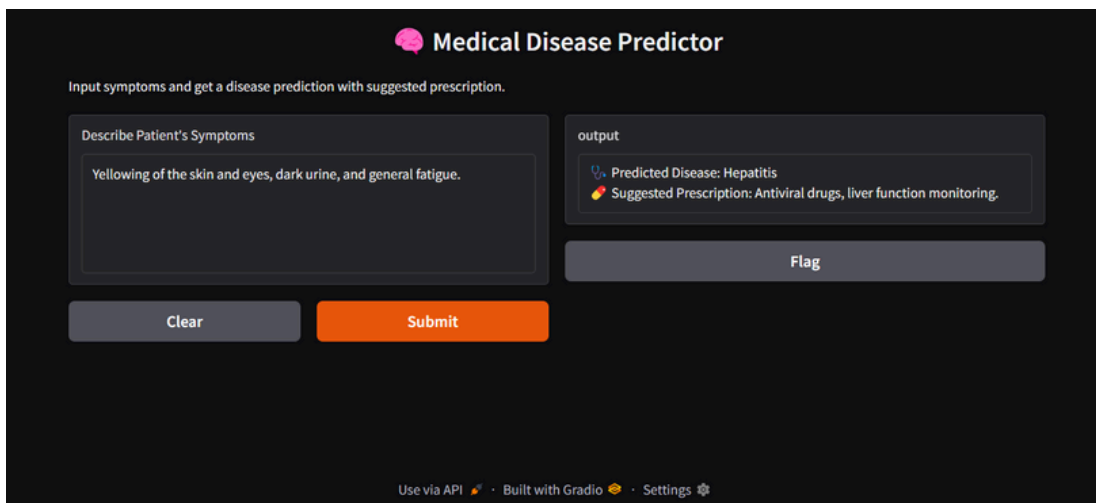
Optimizer: Adam

Metrics: Accuracy

Model Type: Multi-output

7. Sample Predictions

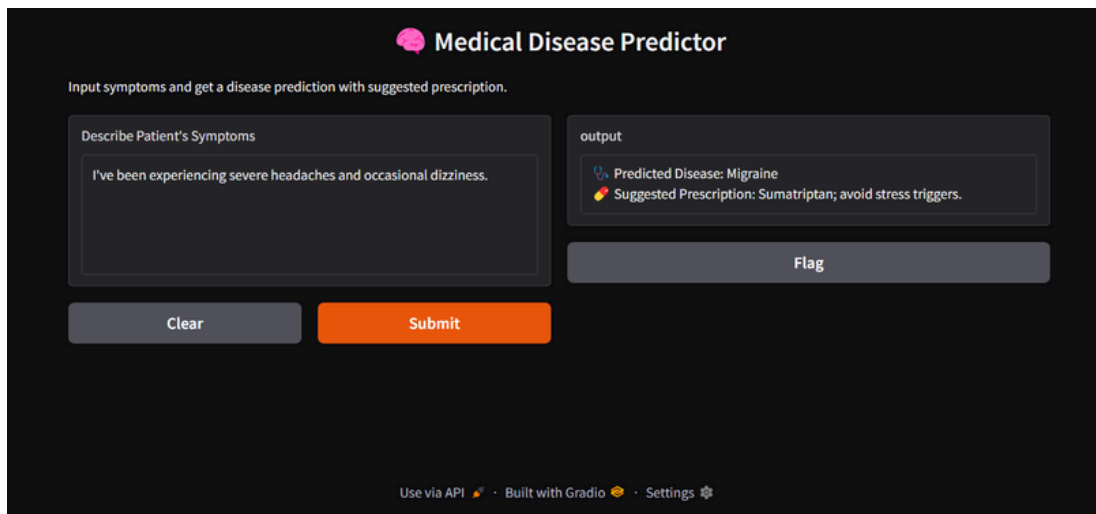
Sample 1: Input -> Disease & Prescription



The screenshot shows a web application titled "Medical Disease Predictor" with a pink brain icon. Below the title is a subtitle: "Input symptoms and get a disease prediction with suggested prescription." The interface is divided into two main sections. On the left, under the heading "Describe Patient's Symptoms", there is a text input area containing the text "Yellowing of the skin and eyes, dark urine, and general fatigue." Below this input area are two buttons: a grey "Clear" button and an orange "Submit" button. On the right, under the heading "output", there is a box displaying the results: "Predicted Disease: Hepatitis" with a blue icon, and "Suggested Prescription: Antiviral drugs, liver function monitoring." with a yellow icon. Below the output box is a grey button labeled "Flag". At the bottom of the page, there is a footer with the text "Use via API" followed by a small icon, "Built with Gradio" followed by a small icon, and "Settings" followed by a small icon.

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Sample 2: Input -> Disease & Prescription



The screenshot shows a web application titled "Medical Disease Predictor" with a brain icon. Below the title is a subtitle: "Input symptoms and get a disease prediction with suggested prescription." The interface is divided into two main sections. On the left, under the heading "Describe Patient's Symptoms", there is a text input field containing the text "I've been experiencing severe headaches and occasional dizziness." Below this field are two buttons: a grey "Clear" button and an orange "Submit" button. On the right, under the heading "output", there is a box displaying the results: "Predicted Disease: Migraine" (with a blue icon) and "Suggested Prescription: Sumatriptan; avoid stress triggers." (with a yellow icon). Below the output box is a grey "Flag" button. At the bottom of the interface, there is a footer with the text "Use via API" (with a flame icon), "Built with Gradio" (with a Gradio logo), and "Settings" (with a gear icon).

8. Sample Deployment Link

Use the link below to interact with the live model or notebook:

<https://761db6159a7287f45d.gradio.live>

(Valid only for 1 week)