Using a Neural Network to Distinguish Between a Healthy Patient and one with Pneumonia Proof of Concept

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Outline

- Business Problem
- Data Understanding
- Explaining the Model
- Model Results and the metrics used

Business Problem

Stakeholder: Board of directors of a national network of hospitals.

Business Problem: Covid has caused a surge in emergency room visits. The hospital is looking for a way to better prioritize patients by the severity of their ailments, particularly pulmonary diseases.

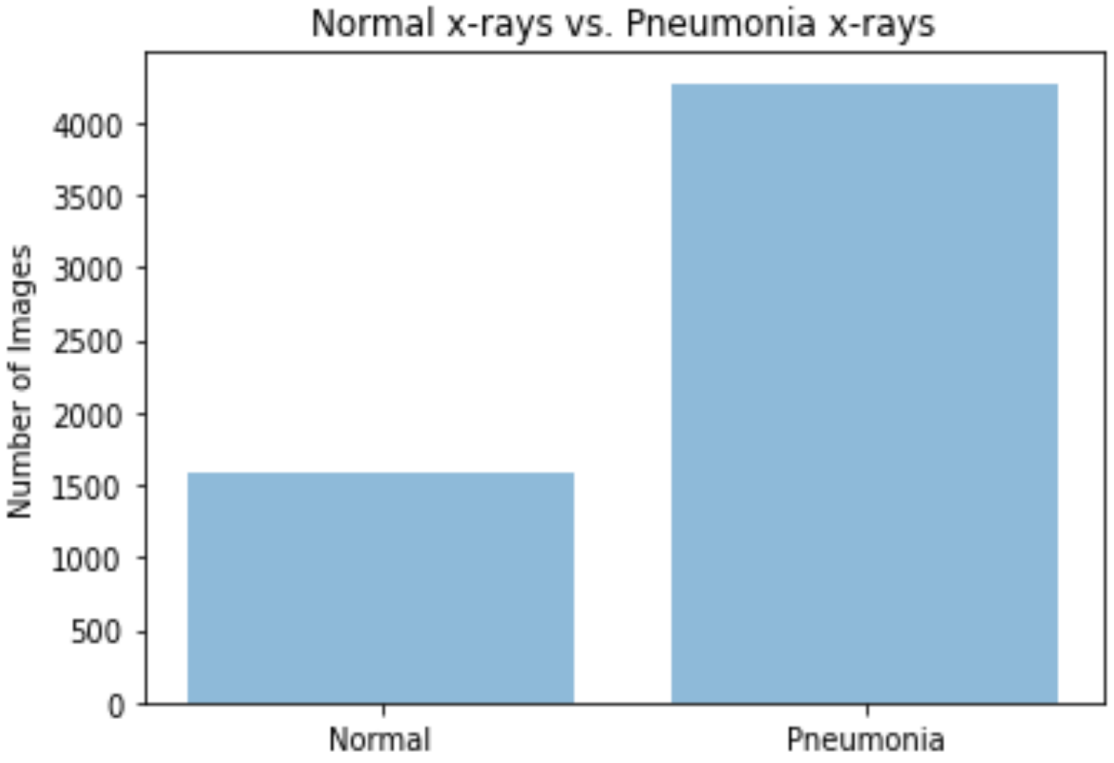
Proposed Solution: A machine learning model that could correctly identify patients with pneumonia, thereby helping prioritize who the doctor will see first.

Solution Benefits:

1. Helps save lives, and protects from more severe damage caused by the disease.
2. non-invasive
3. cost-effective
4. no medical background necessary to run the model

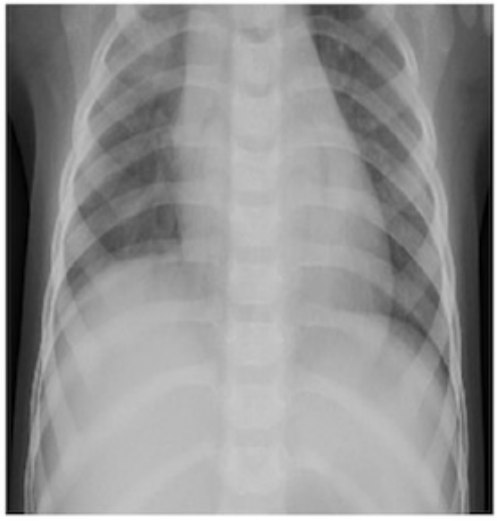
Data Understanding

- The data comes from Kaggle.com.
- There are a total of 5856 images.



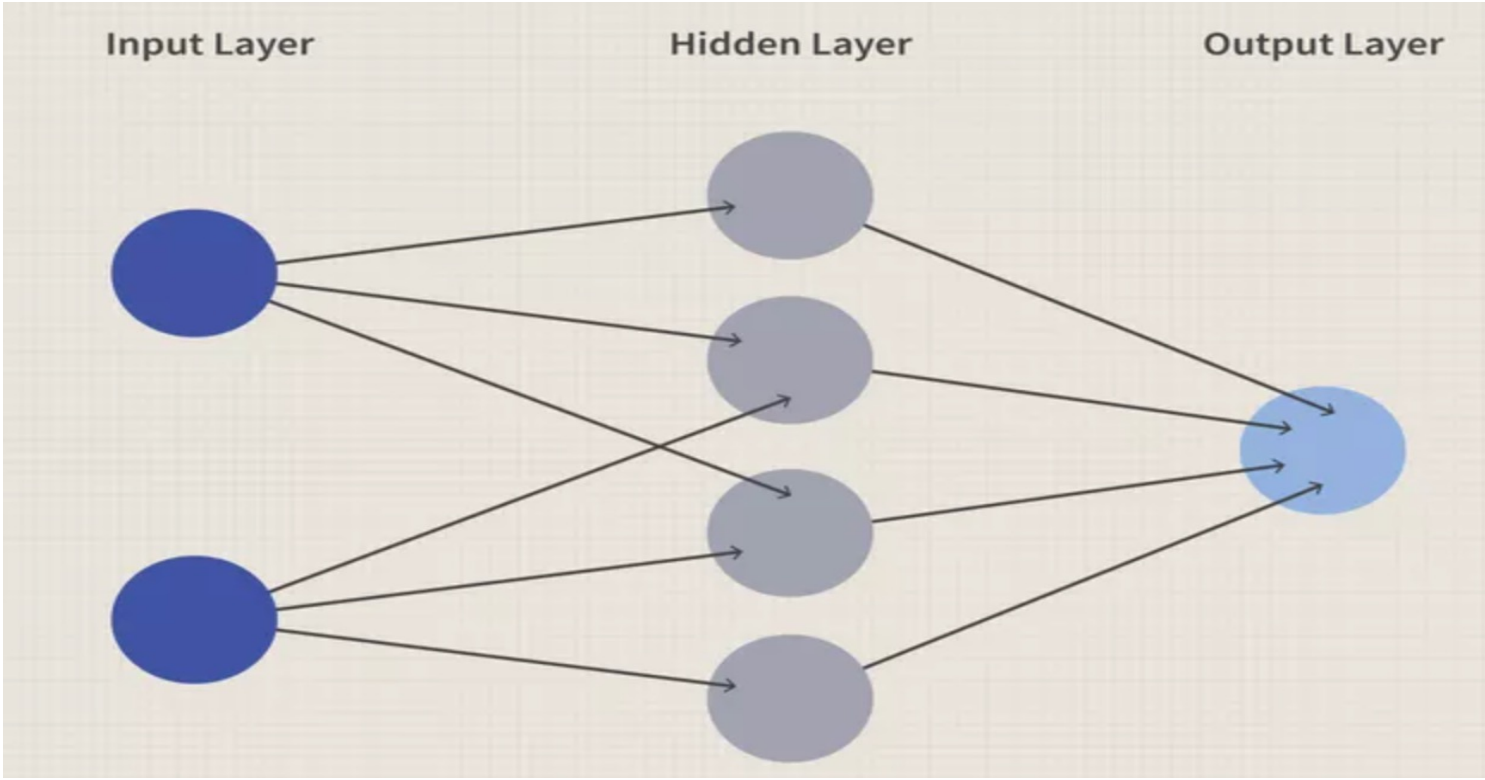
normal image

pneumonia image



The Model: What are Neural Networks ?

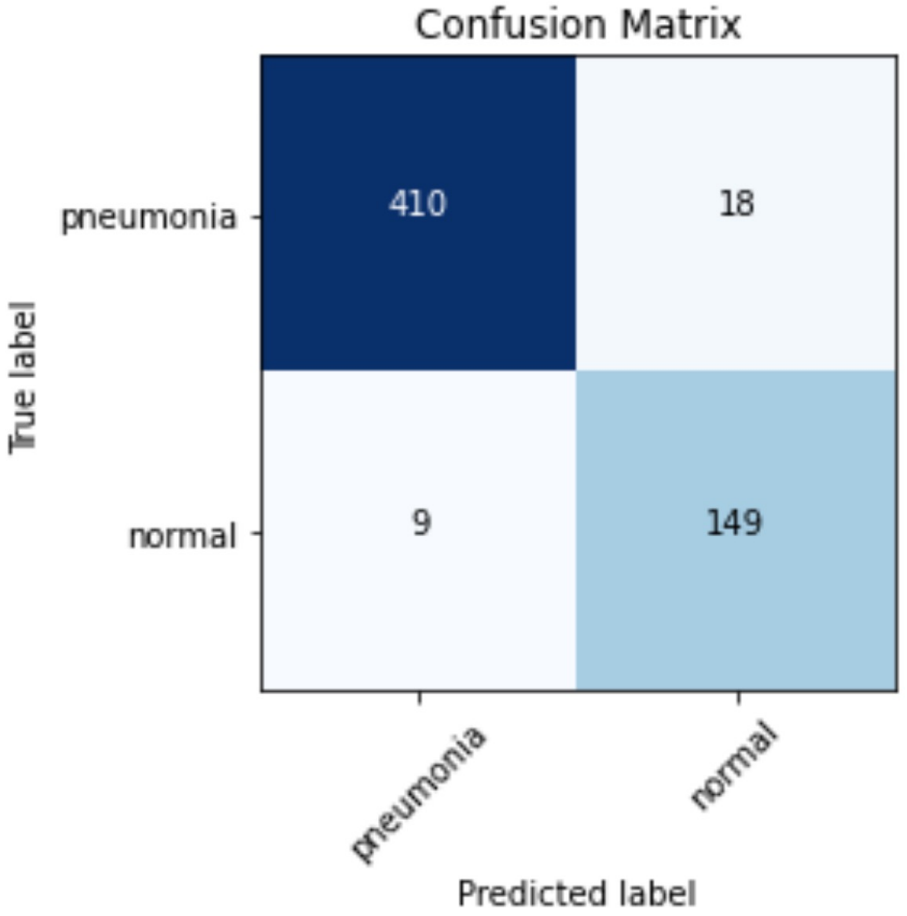
- **Neural networks were inspired by the human brain.**
- The data moves from left to right
- Neural networks are very scalable



The circles are the ‘artificial neurons’ or nodes. The input layer receives the data. The output layer returns a result, and the hidden layer(s) are any layers in between the input and output layers.

Model Results

- **Primary Goal:** model to identify all the patients who had pneumonia.
- **Metric Used and Performance:** Recall score of nearly 96%
- **Secondary Goal:** model to correctly identify all the images.
- **Metric Used and Performance:** Accuracy score of over 95%.



Any Questions?

Thank You