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**Final Project**

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3/21/2024 **Annual Review**

## **Hepatitis Category Classifier: Predictive Modeling using Artificial Neural Networks**



3/21/2024 **Annual Review**

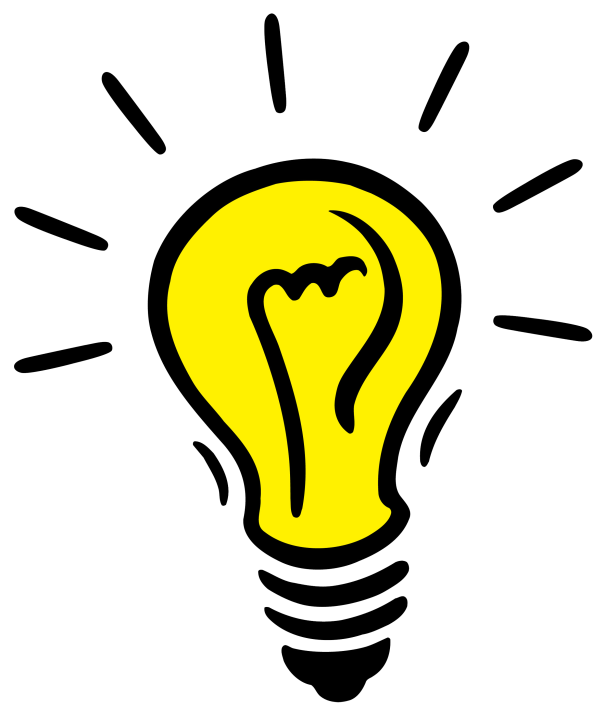
# AGENDA

* PROBLEM STATEMENT
* PROJECT OVERVIEW
* WHO ARE THE END USERS?
* YOUR SOLUTION AND ITS VALUE PROPOSITION
* THE WOW IN YOUR SOLUTION
* MODELLING
* RESULTS

PROBLEM STATEMENT

Develop a predictive model using Artificial Neural Networks (ANNs) to classify hepatitis patients into different categories based on their clinical data and laboratory test results.

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PROJECT OVERVIEW

Create a predictive model using ANN that accurately classifies hepatitis patients into different categories (e.g., hepatitis A, hepatitis B, hepatitis C) based on their medical information.

Overview:

* Introduction
* Objective
* Data collection
* Data preprocessing
* Exploratory data analysis(EDA)
* Model development
* Model training
* Model evaluation
* Model testing and Deployment
* **Conclusion**



**WHO ARE THE END USERS?**

* **Healthcare professionals**
* **Medical researchers**
* **Healthcare institutes and administrators**
* **Patients**
* **Public health authorities**

**YOUR SOLUTION AND ITS VALUE PROPOSITION**



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1. The accurate categorization aids healthcare professionals in making precise and timely treatment decisions.
2. Healthcare providers can identify hepatitis patients at an early stage of the disease, enabling prompt intervention and treatment.
3. Healthcare systems streamlines the diagnostic process, leading to improved efficiency and resource utilization.
4. It facilitates the development of personalized treatment plans tailored to the specific hepatitis type and individual patient characteristics.
5. It empowers healthcare professionals with advanced diagnostic capabilities, enabling them to deliver high-quality care to hepatitis patients.
6. The solution contributes to broader public health objectives such as disease surveillance, prevention, and control.



THE WOW IN YOUR SOLUTION

* **Accurate Prediction:** Achieving high accuracy in medical diagnosis tasks is crucial for ensuring effective treatment and management of patients.
* **Early Detection:** Early detection allows for timely intervention, which can significantly improve patient outcomes by preventing disease progression and reducing the risk of complications.
* **Efficiency Improvement:** This efficiency improvement can have a significant impact on patient care delivery, reducing diagnostic delays and optimizing treatment planning.
* **Personalized Treatment Plans:** Personalized treatment approaches are increasingly recognized as essential for optimizing treatment outcomes and patient satisfaction.
* **Public Health Impact:** The ability to identify high-risk populations and track disease trends is essential for developing targeted interventions and reducing hepatitis burden.
* **Enhanced Healthcare Delivery:** This enhancement in healthcare delivery has the potential to improve patient outcomes and satisfaction.

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# MODELLING

Certainly! Here are the steps involved in the modeling process for the Hepatitis Patient Category Prediction Using ANN project:

1. Data preprocessing.

2. Data splitting.

3. Model architecture design.

4. Model compilation.

5. Model training.

6. Hyperparameter tuning.

7. Model evaluation.

8. Model deployment.

# RESULTS

* Accuracy: High percentage of correctly predicted hepatitis categories.
* Precision: Ability of the model to correctly identify positive instances (hepatitis patients) out of all instances predicted as positive.
* Recall: Ability of the model to correctly identify positive instances out of all actual positive instances in the dataset.
* Confusion matrix: Tabular representation of true positive, false positive, true negative, and false negative predictions made by the model.
* Average performance metrics across different folds of cross-validation to assess the model's stability and generalization ability.
* ROC curve: Plot showing the trade-off between true positive rate and false positive rate across different threshold values.
* Comparison of ANN model performance with baseline models or alternative machine learning algorithms, if applicable.