1] INTRODUCTION -

a) Overview :-

Thyroid disease is the general concept for a medical problem that prevents one's thyroid from producing enough hormones. Thyroid disease can affect everyone - men, women, children, adolescents, and the elderly. Thyroid disorders are detected by blood tests, which are notoriously difficult to interpret due to the enormous amount of data necessary to forecast results. For this reason, this study compares eleven machine learning algorithms to determine which one produces best accuracy for predicting thyroid risk accurately.

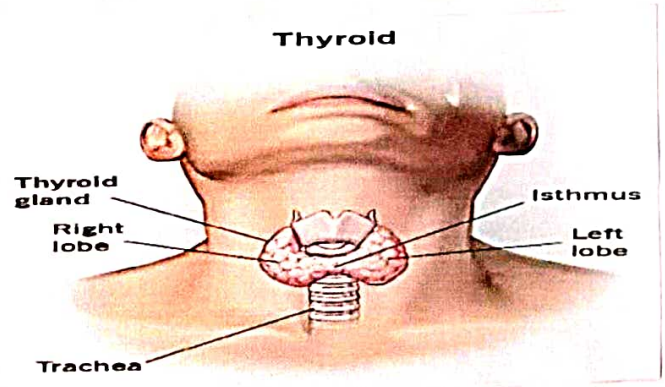
b) Purpose :-

The purpose of this project is to decide the type of "medicine" or "drug" which should be given to the patient suffering from thyroid depending upon their respective "BP" (blood pressure), "Cholesterol" and "Na_to_K" levels. This project is just a try to reduce the thyroid illness. The person must give the exact values in required fields for accurate prediction.
In this project we have used a dataset based on the list of drugs. T4 (tetraiodothyronine or thyroxine) and T3 (triiodothyroxine) are thyroid hormones that help regulate metabolism. Thyrotropin is responsible for the regulation of these two thyroid hormones. All kinds of hyperthyroidism are caused by an excess of these hormones.
Other illnesses, such as serious diseases, can be attributed to excessive hormone production.

2] LITERATURE SURVEY –

a) Existing Problem :-

There are few things you can do to help reduce your chances of developing thyroid disease. Ask for a thyroid collar when you get an X-ray, avoid smoking, and limit your intake of soy. You can also try to avoid potential environmental contaminants. Finally, make sure to see your primary care doctor every year. There are no guarantees you won't develop thyroid disease, and a family history of autoimmune thyroid conditions can put you at higher risk.



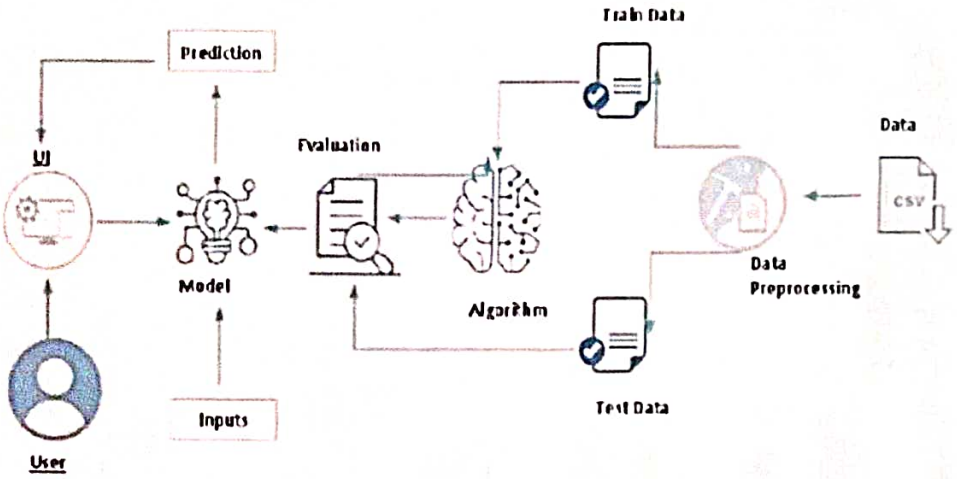
b) Proposing Solution :-

It's good to take preventative measures when it comes to your thyroid. This can help lessen your risk of problems. If you are at risk of thyroid disease, it's importance to be proactive in noticing any early symptoms so you can get treatment as early as possible if you need it.

One could go for total thyroidectomy for Graves' hyperthyroidism.

3] THEORITICAL ANALYSIS -

a) Block diagram :-

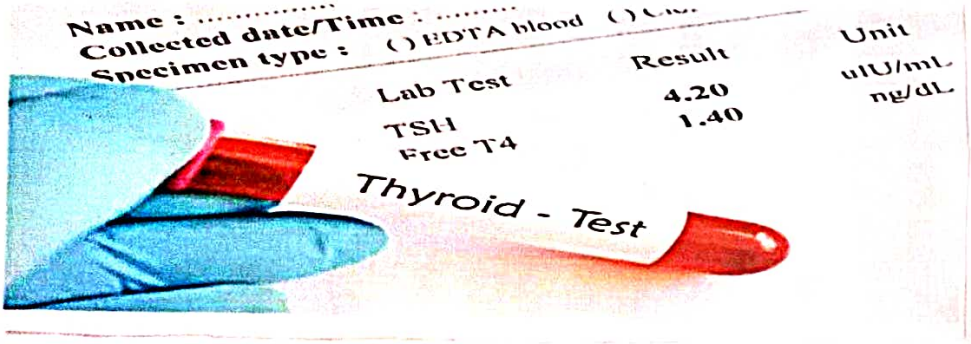


b) Hardware / Software Designing Requirement

A normal PC system or laptop could be used as hardware and makesure that they are atleast windows 6 with 4 GB RAM, 256 hard disk. Anaconda navigator, python or spyder any of it could be used to run "app.py" after building the application. Skills required are Python, Python web Frame works, Python For Data Analysis, Python Data Visualization, Exploratory Data Analysis and Data Preprocessing Techniques.

4] EXPERIMENTAL INVESTIGATIONS –

Thyroid tests will tell your healthcare provider how well your thyroid gland works. These tests can help diagonize conditions like hyperthyroidism, hypothyroidism, Graves' disease, Hashimoto's disease and thyroid cancer. Types of thyroid tests include blood tests, imaging tests and nuclear medicine tests.

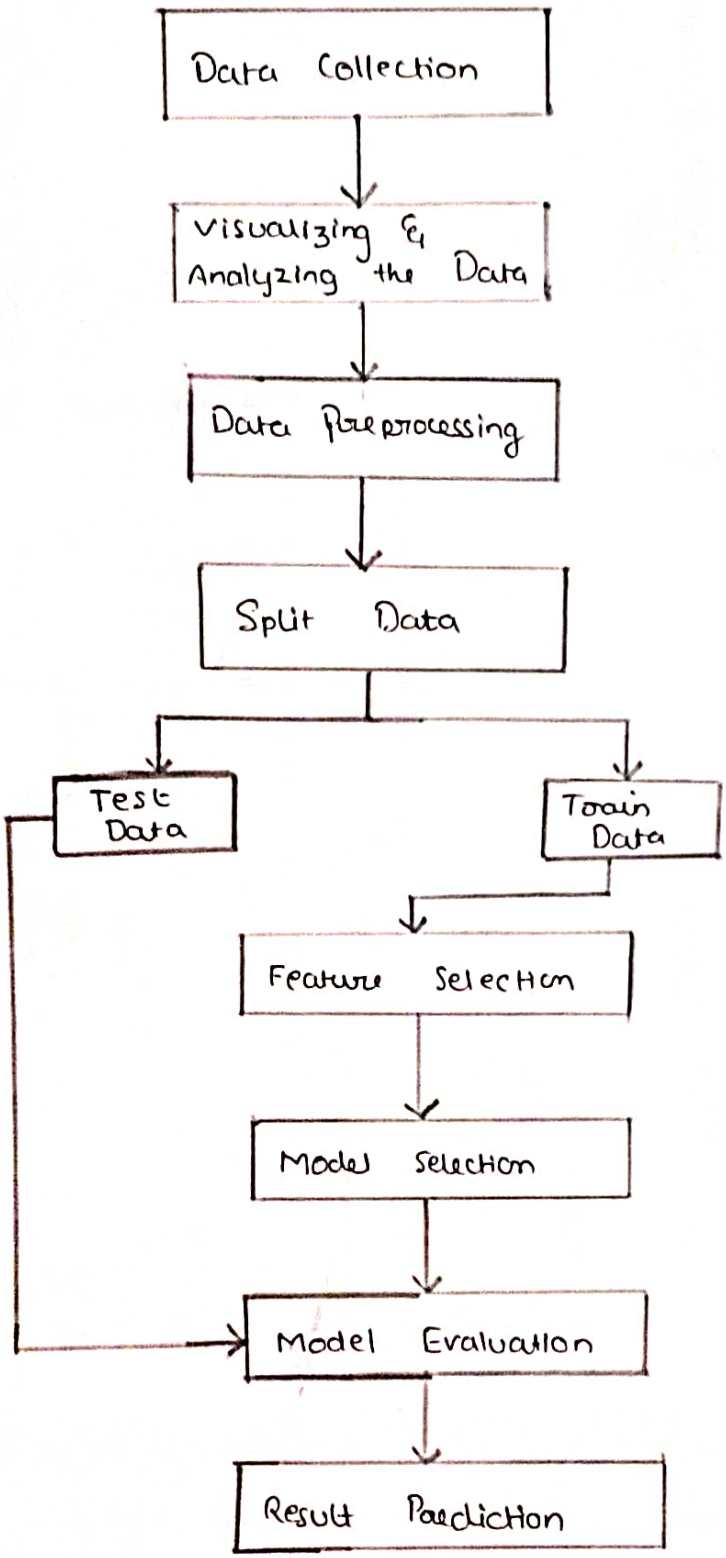


If your TSH level is high, it might mean you have hypothyroidism. This means your thyroid gland doesn't make enough thyroid hormone.

On the other hand, if your TSH is low, it could indicate hyperthyroidism. In this case, your thyroid gland makes too much thyroid hormone.

Overactive and underactive thyroid can interfere with daily routines and hinder your quality of life. If you have symptoms of thyroid disease, a thyroid test can find out what's causing them so your provider can recommend treatment.

5] FLOWCHART -

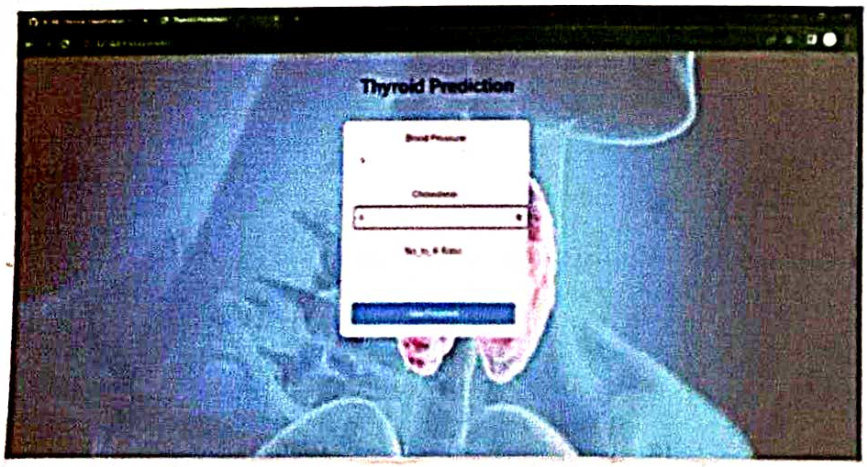

Data Collection
Visualizing & Analyzing the Data
Data Preprocessing
Split Data
Test Data
Train Data
Feature Selection
Model Selection
Model Evaluation
Result Prediction

6] RESULT -

The codes are written perfectly so final the project is successful and is running good.

The final output of the project will decide the medicine which should be taken depending on the values of "BP", "Cholesterol" and "Na_to_k" given.

After running the URL in browser the homepage will open up ; press on predict and give the values and click submit for final result.



7] ADVANTAGES & DIS-ADVANTAGES –

a) Advantages :-

- No recurrent hyperthyroidism
- No radiation risk
- Rapid control of hyperthyroidism
- No reported detrimental effect on the course of Graves' Orbitopathy.

b) Dis-advantages :-

- Risk of postoperative hypoparathyroidism.
- Risk of recurrent nerve palsy.
- Permanent hypothyroidism
- Risks related to anesthesia or surgery
- Costs
- Hospitalization
- Permanent scar

8] APPLICATIONS –

- Estimate the likelihood of a better outcome when more data is used, as increasing thyroid prediction accuracy will enhance thyroid problem identification.

- To enhance the model's performance, a variety of pre-processing techniques like identifying and handling the missing values, encoding the categorical data etc. are applied.

- To evaluate the effectiveness of the employed machine learning algorithms, the accuracy, precision, recall, and F1- scores are examined.

- The target variable in the Thyroid Disease dataset is the diagnosis of thyroid disease for each patient.

- The goal of the dataset is to predict the type of medicine the person has to use depending upon the values given.

9] CONCLUSION -

The study presents a thyroid disease prediction approach which utilizes random forest - based features to obtain high accuracy. The approach can obtain a 0.99 accuracy to predict ten thyroid diseases.

For the most part, the emphasis is placed on the optimization of machine learning and deep learning models and the feature selection part is under - studied or completely ignored for a thyroid disease problem.

Despite the high accuracy reporting approaches, such approaches are tested on samples under 1000, and results are not validated.

A novel machine learning based thyroid disease prediction approach is proposed that focus on the multi-class problem.

10] FUTURE SCOPE -

Over the last decade, surgeons have witnessed dramatic changes in surgical practice as a result of the introduction of new technological advancement. Some of these changes include refinement of techniques in thyroid cancer surgery. The development of various endoscopic thyroidectomy techniques, the addition of the da Vinci robot, and the use of operative adjuncts in thyroid surgery, such as intraoperative neuromonitoring and quick intraoperative parathyroid hormone, have made thyroid cancer not only safer and better accepted by patients with thyroid cancer but also offer them more surgical treatment options

11] BIBILOGRAPHY —

GitHub repository of the trainers — https://github.com/HariPrabhu741/APSCHE-AI-ML
https://github.com/SaumyaMohandas/Apscheap_AIML

Datasets - https://www.kaggle.com/datasets/mexwell/us-school-scores

https://www.kaggle.com/datasets/shree1992/housedata

Recorded Link - https://apsche-vip.teachable.com/purchase?product_id=501540