

## PROJECT DEVELOPMENT PHASE

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### SPRINT -3

PROJECT ID	PNT2022TMID21545
PROJECT NAME	ANALYTICS FOR HOSPITAL HEALTH CARE DATA

#### EPIC:

Dashboard

#### TASKS:

- As a user, they get an interactive dashboard to understand the data easily.
- As a patient, they are able to find the available rooms in each hospital.
- As a user, they are able to change the visualisations as their convenience.

#### TOOLS USED:

##### DASH - Python Framework:

- Dash is an open-source Python framework used for building analytical web applications.
- It is a powerful library that simplifies the development of data-driven applications.
- It's especially useful for Python data scientists who aren't very familiar with web development.
- Users can create amazing dashboards in their browser using dash.

#### DESCRIPTION:

This is the home page of our dashboard. It has navigations like Dashboard, Insights and the Classification. It depicts the number of cases ,number of hospitals, and the number of departments there are in that region. Here we can select the hospital id to look into more insights about the hospital. There are several graphs which show the patient's stay, and their particular department, severity of the particular patient, age wise category and finally the mean length of stay.

DASHBOARD PAGE:



### **No. of Patients in each stay:**

In this graph, we have chosen the number of patients in each stay in Y-axis we have chosen the number of patients and in the X-axis we have chosen the length of stay of the patients. It gives the users a clear idea of how long the patients are staying. For example from the above graph we came to know that length of stay 21-30 has more patients in that hospital.

### **No of Patients Vs Department:**

In this graph we have look into the number of patients with respect to the departments. In the X-axis we have chosen the departments and in the Y-axis we have chosen the number of patients. With this graph it gives the inference to the users how many users are there in the department and which department is better in treating. For example from above graph we came to know that gynaecology department has more patients than other departments in that hospital.

### **No of Patients vs Severity of illness:**

In the third graph we have chosen the graph on number of patients with the severity of illness. In the X-axis we have chosen severity of illness and in the Y-axis we have chosen the number of patients. It gives the users an idea about how severity of illness the hospital is dealing with it. For example from the above graph it is evident that moderate severity of illness is more in that hospital.

### **Patients by age:**

In the fourth graph we displayed the age of the patients who were admitted in that particular hospital. It gives the idea about what age category of the patients are admitted there in the hospital. For example, we came to know that the majority of the patients in that hospital are between 31-50.

### **Mean length of stay**

In the Insights menu we have the attributes like hospital code ,department ,type of admission,severity of illness,age,ward type,ward facility code,hospital region code,hospital type code , the graph gives us the details about the mean admission deposit with respect to the mean length of stay.

## PREDICTION OF LENGTH OF STAY PAGE:

The screenshot shows a web application titled "Prediction of Length of Stay". It features a form with several input fields: "Hospital Code:" (value: 1), "Hospital Type Code:" (value: a), "Department:" (value: TB & chest disease), "Ward Type:" (value: P), "Bed Grade:" (value: 1), "Type of Admission:" (value: Emergency), "No of visitors:" (value: 0), and "Age:" (value: 0-10). Each dropdown menu has a close button (x) and a dropdown arrow. A blue "Predict" button is located below the form. To the right of the form is a blue circular button with left and right arrow icons. Below the form, a dark blue box displays the "Predicted Length of Stay:" as "21-30 days" in yellow text. To the right of this box is another blue circular button with left and right arrow icons.

## ALGORITHM USED:

### Random Forest:

- Random Forest is a popular machine learning algorithm that belongs to the supervised learning technique.
- It can be used for both Classification and Regression problems in ML.
- It is based on the concept of ensemble learning, which is a process of combining multiple classifiers to solve a complex problem and to improve the performance of the model.
- It is a classifier that contains a number of decision trees on various subsets of the given dataset and takes the average to improve the predictive accuracy of that dataset.
- The greater number of trees in the forest leads to higher accuracy and prevents the problem of overfitting.

### How it works:

To predict the length of stay we are getting the inputs like hospital code, hospital type code, department, ward type, bed grade, and type of admission and the number of visitors with all that information we can predict the length of stay using random forest machine learning algorithm. It gives prediction for the length of stay of patients in the hospital.