

# **Revenue Forecasting for a Healthcare Clinic**

## **Introduction**

The purpose of this analysis is to forecast the revenue and number of unique patients for a clinic in the year 2023 based on the available data from previous years.

## **Data Description**

The dataset used for this analysis contains information about the clinic's appointment bookings from the years 2019 to 2022. It includes features such as appointment ID, date, time, patient ID, and revenue generated from each appointment.

## **Exploratory Data Analysis**

Before building the models, we first explored the data to gain insights and identify trends. The following observations were made:

- The revenue generated from the clinic's appointments has been increasing steadily over the years.
- The number of unique patients has also been increasing, but the rate of increase has slowed down in recent years.
- There is a clear seasonality in the number of appointments booked, with higher numbers in the summer months and lower numbers in the winter months.

## **Methodology**

We used three different models to forecast the revenue and number of unique patients for the year 2023:

- Rule-based or deterministic forecasting approach
- Linear Regression
- ARIMA model

### **Rule-based or deterministic forecasting approach**

This approach involves using rules and assumptions to make predictions. We used two rules to predict the revenue and number of unique patients for 2023 based on the available data:

The revenue generated in the year 2023 will be 20% higher than the revenue generated in 2022.

The number of unique patients in the year 2023 will be the same as the number of unique patients in 2022.

Based on these rules, we predicted the following:

- Expected revenue in 2023: \$349.34.
- Expected number of unique patients in 2023: 22030

## Linear Regression

Linear Regression is a statistical method that involves fitting a linear equation to the available data to make predictions. We used the available data from 2022 to predict the revenue and number of unique patients for the year 2023.

Based on the linear regression model, we predicted the following:

- Expected revenue in 2023: \$524.02.
- Expected number of unique patients in 2023: 459711

## ARIMA model

The ARIMA (Autoregressive Integrated Moving Average) model is a time series forecasting method that is used to make predictions based on patterns observed in the historical data. We used the monthly data from 2019 to 2022 to generate predictions for each month in 2023, and then summed up these predictions to get the total revenue for the year.

Based on the ARIMA model, we predicted the following:

- Expected revenue in 2023: \$2090.71.
- Expected number of unique patients in 2023: 22030

## Conclusion

In conclusion, based on the different models used, we predict that the revenue and number of unique patients for the clinic in the year 2023 will be as follows:

- Expected revenue in 2023: \$349.34 (deterministic approach), \$524.02 (linear regression), \$2090.71 (ARIMA model)
- Expected number of unique patients in 2023: 22030 (deterministic approach), 459711 (linear regression), 22030 (ARIMA model)

It is important to note that these predictions are based on the available data and the assumptions made and may not be entirely accurate. Nonetheless, they provide a useful estimate for the clinic's revenue and patient volume in the year 2023, which can be used for planning and decision making.