



WEB TRAFFIC TIME SERIES FORECASTING

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Abstract: By offering insights into potential website visitor patterns, web traffic time series forecasting is vital to many different organizations and industries. Businesses can improve customer experience overall, resource allocation, marketing tactics, inventory control, and pricing by using accurate forecasts. The notion of web traffic time series forecasting is investigated in this abstract, emphasizing its importance and prospective applications. It includes forecasting methods like auto-ARIMA and exponential smoothing, which are frequently used to identify trends and generate forecasts based on past online traffic data. The abstract also discusses the significance of including outside data sources, sophisticated machine learning methods, and real-time forecasting capabilities for increased accuracy. The ultimate objective is to equip companies with the tools they need to use web traffic time series forecasting to improve customer happiness, make smart decisions, and increase operational efficiency.

I. INTRODUCTION

It is essential for facts researchers and business investigator to acquire time arrangement insightful abilities. Time association facts set had been the fastest growing magnificence of statistics units in the previous years, and each standard ventures and springing up innovation agencies were growing additional time arrangement facts.

A few times of time arrangement facts bases are the economic marketplace statistics set, climate estimating facts set, clever domestic tracking database, and supply chain tracking database. It is vital for facts analysts and commercial enterprise agent to attain time route of action eager capacities. Time plan informational collection were the speediest developing class of informational indexes inside the past two years, and both standard endeavors and emerging improvement groups have been making greater time course of motion records.

Now days, more and more humans are getting access to the net all over the global, the upward push in traffic for nearly all web sites are unavoidable. The increment in site visitors for the websites should cause a lot of disputes and the company which survives to management with the visitors adjustments within the most systematic manner is proceed to be triumphant. As most of the people might also have very gradual loading time for a internet site whilst there are lots of people the usage of it, like while various shopping web sites may pound simply before commemoration as more human beings try to log into the website than it become in the beginning green of which only a bargain of disruption for the users and as a result of that it could downturn the consumer's scores of the website online and as a substitute use every other website, therefore, shorten their commercial enterprise. for this reason, a visitors control technique or plan need to be put in place to lessen the threat of such allotment which may be damaging to the life of the company. until latterly, there wasn't an critical for such gear as most servers may want to manage the visitors inscription however the smartphone age has enlarged the ultimatum to such a high stage for some web sites that groups couldn't have reacted right now sufficient to keep their orderly customer service stage. comparing net site visitors on a web server is rather vital for net service providers due to the fact that, without a conventional dictate forecast, clients may want to have lengthy bide one's time and spontaneity that website. nonetheless, that is a backbreaker challenge since it critical to make dependable predictions primarily based on the arbitrary nature of human conduct.

We convey out an structure that gathered source records and in a supervised way executes the forecasting of the time series of the web page perspectives. there are numerous researches going on in this area of gauging internet site visitors. As a context orientated examination so far ARIMA, Holt wintry weather likewise, various preferred approaches are used at this point for higher result the neural affiliation comes into place with wavelet plan assessment for predicting net traffic. even though this is direct and supportive device for figures of net visitors prong sport plan, it's miles sensibly jumbled similarly as drawn-out expressly for steady evaluation of net visitors and its adaptability all through a huge time game plan information trouble. another author had a pass at utilising the victorious model of RNN (Repetitive neural company) seq2seq version with middle as a further factor in diverse time intervals, it may have been additionally improved with greater examination on upgraded model and highlight set. There have been gigantic variety of exploration endeavors in contemplating and estimating web site visitors and least examination works are zeroing in on the time-related perceptions that are springing up for the exam and obstruction to arrangement and parent in assisting with assessing future visits of web site pages. consequently, in this exploration we're proceeding to make use of a few more listing of talents to take care of the

model with worldly and low spikes in net visitors and further enhance the model layout to estimate destiny visitors to pages all the extra exactly and increment the dependability of forecasts results.

Problem statement

Web traffic, defined as the number of requests sent and received by users to a website, constitutes a significant portion of internet traffic. Predicting web traffic is crucial for avoiding website crashes, minimizing downtime, and implementing measures like load balancing to ensure a smooth user experience. The objective is to develop a time series forecasting model to accurately predict future web traffic, enabling better traffic control decisions.

II. Block diagram

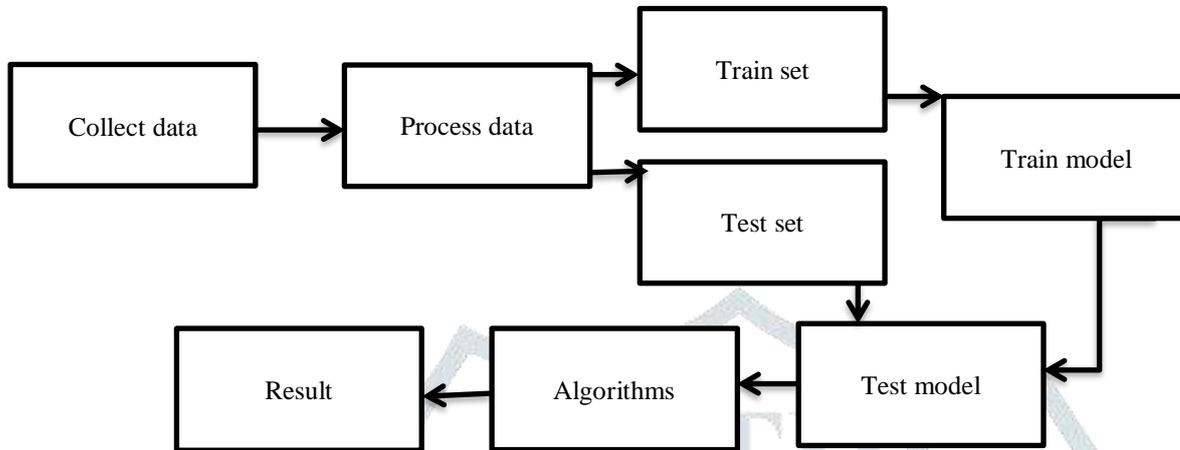


Fig 1: Block diagram of web traffic time series forecasting

As per the above block diagram the result is the output of the forecasting model, which provides predictions of future web traffic based on the trained model. These predictions can be used for traffic control decisions, such as optimizing server resources, implementing load balancing strategies, or allocating bandwidth effectively. Using above block diagram, we Forecast using exponential smoothing & auto-ARIMA algorithm.

III. Flowchart

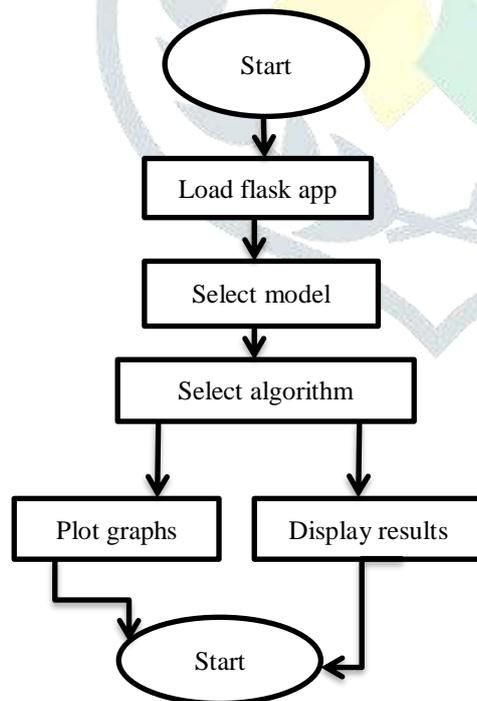


Fig.2: flowchart

Steps:

- Load the time series network traffic into data collection.
- Load the flask app in the simulator.
- Then select the models.
- Then choose the algorithm.
- Then plot the graphs and display on the screen.

IV. RESULTS AND DISCUSSION

The results of web traffic time series forecasting can vary depending on the specific approach, data quality, model selection, and other factors. However, when implemented effectively, web traffic forecasting can yield several beneficial outcomes:

4.1 login page

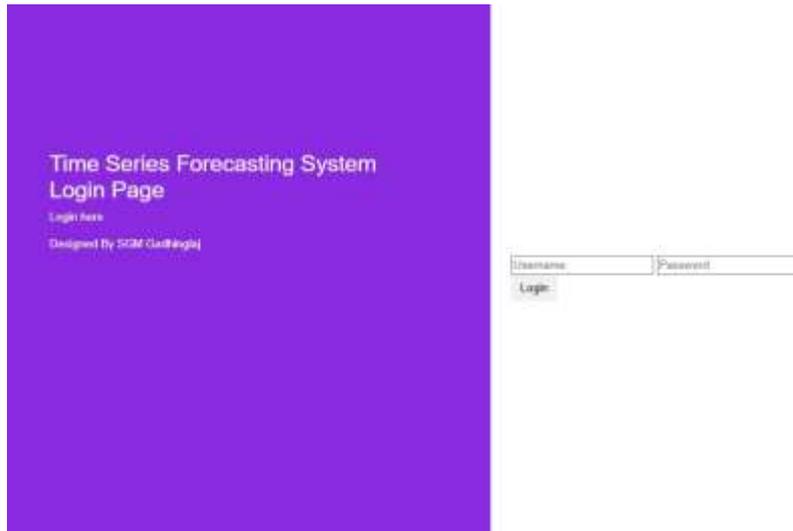


Fig 4.1: login page

The login page of our system provides secure access to the platform, ensuring that only authorized users can gain entry and utilize its features. Our login page is designed with simplicity, functionality, and security as key considerations.

When you navigate to our login page, you'll be presented with a professional and intuitive interface. The page prominently displays the login form, which requires you to enter your unique credentials to proceed. You'll find clearly labeled input fields for your username or email address and password, making it easy to enter the required information.

4.2 Application

Time series forecasting- SGM,GADHINGLAJ.



Fig 4.2: Application

Forecasting using Exponential Smoothing

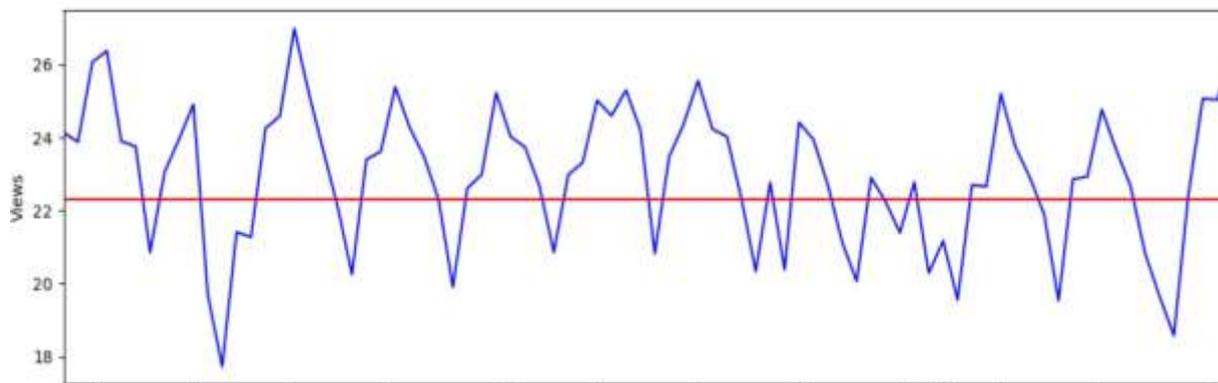


Fig 4.3: Forecasting using exponential smoothing

Exponential smoothing is a widely used technique for time series forecasting that assigns exponentially decreasing weights to past observations. It is particularly effective when the time series exhibits a trend or seasonality.

Forecasting using Auto-arma

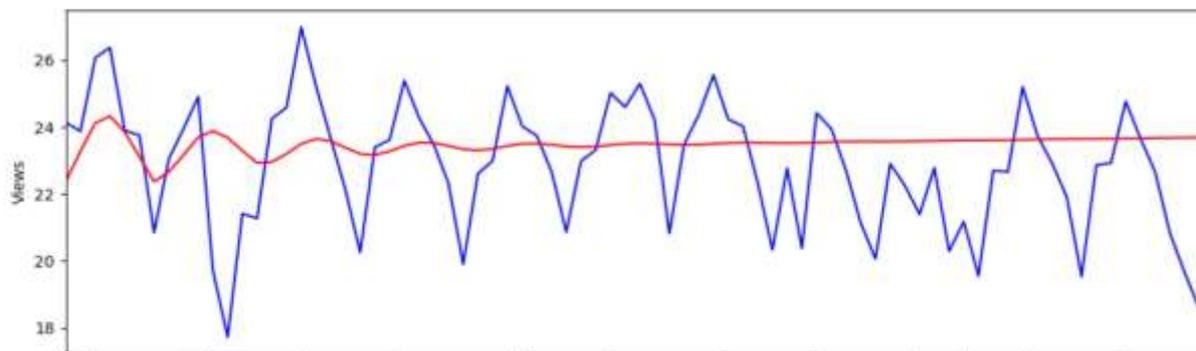


Fig 4.4: forecasting using auto-ARIMA

Auto-ARIMA, short for Automatic Autoregressive Integrated Moving Average, is a powerful algorithm used for time series forecasting. It automates the process of selecting the optimal parameters for an ARIMA model, which is a popular class of models used to capture the temporal dependencies in time series data.

4.3 display pages for demo website

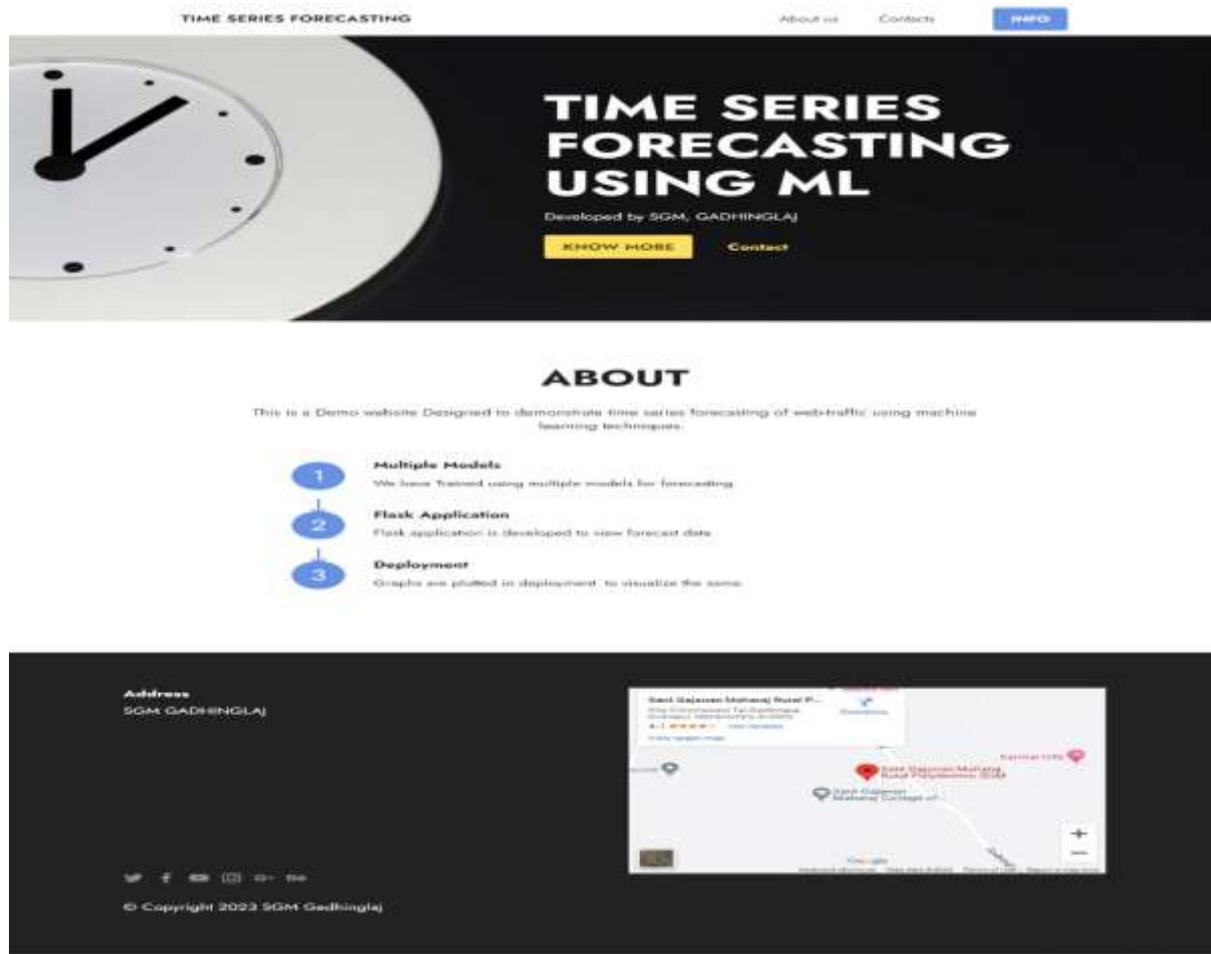


Fig 4.5: display pages for demo website

V. Conclusion

In conclusion, web traffic time series forecasting is a valuable technique that helps businesses and website owners understand and predict future website visitor patterns. By analyzing historical web traffic data, businesses can make informed decisions, optimize their marketing strategies, allocate resources effectively, and improve the overall user experience. Several methods and models can be used for web traffic time series forecasting, including traditional statistical approaches like ARIMA, as well as more advanced techniques such as machine learning algorithms, neural networks, and deep learning models. The choice of model depends on the complexity of the data, the availability of historical information, and the specific forecasting goals.

Web traffic time series forecasting is not without its challenges. It can be influenced by external factors that are difficult to predict, such as sudden changes in user behavior, new competitors entering the market, or unexpected events. Therefore, it is crucial to consider the limitations of the forecasting models and complement them with other data sources and domain expertise to obtain a comprehensive understanding of web traffic dynamics. Overall, web traffic time series forecasting is a powerful tool that can provide valuable insights for businesses to make informed decisions and optimize their online presence. By leveraging the appropriate forecasting techniques and staying up to date with the latest trends and developments, businesses can gain a competitive edge and maximize the value of their web traffic.

References

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