**Final Weekly Project Report**

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**Project- Long Call Timer**

**Mentor- Mr. Sridharan Natarajan**

**Report Submitted by-**

**Abhishek Raj Permani**

**MAGPIE Intern’20**

**Problem Statement**

Most of service providers have a threshold value of each call, once the call duration exceeds this threshold value, the call automatically gets disconnected, and this value cannot be very small (because this will end call very frequently, which will leave users unsatisfied) also cannot be very large(because this will increase the load on network lines), it should be optimal.

We have to find that value of time after which the user has to redial again in order to continue. Also, a fix percentage of users must be satisfied with that time value.

**Satisfied Percentage of users**- is the percentage of total users, who ends the call before that end call time value, which we have to calculate.

**Weekly Work Done-**

**Week 1-**

Problem statement was shared with me. I started learning basics of python and time series analysis.

**Week 2-**

Started working on the data set using python libraries. Also, was studying different statical models of time series analysis, like-

* Autoregression (AR)
* Moving Average (MA)
* Autoregressive Moving Average (ARMA)
* Autoregressive Integrated Moving Average (ARIMA)

**Week 3-**

Completed the part of Dataset , and started working on its analysis part.



**Part of Dataset for User with User ID-1**

**Week 4-**

Started with considering the average duration of each user for each single day, and got the below plot.



Duration

**Plot of Data of User ID-1 (Duration vs Date)**

**Week 5-**

Applied different methods like AR model, LSTM on the generated data set ,but faced problems, so finally decided and discussed with Mentor , to go with ARIMA model, and obtained the below autocorrelation plot from generated datset-



**Autocorrelation Plot of User ID-1 Dataset**

Also, obtained the Density plot-

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**ARIMA Fit Residual Error Density Plot**

**Week 6-**

Applied ARIMA model and fit the mode on generated dataset, and obtained the below summary-

**summary of the fit model**

**Week 7-**

Forecasted the generated dataset using ARIMA model and obtained the plot below-

**Predicted Values Expected values**



Time

Duration

**ARIMA Rolling Forecast Line Plot**

(A line plot is created showing the expected values (blue) compared to the rolling forecast predictions (red). We can see the values show some trend and are in the correct scale.)

**Week 8-**

Asked for the percentage of satisfaction from Mentor and calculated the RMSE value and also the required Threshold Time Duration value for that percentage of Satisfaction- (Result for 95% Satisfaction Percentage)

RMSE Value= 15.879966352 minutes

Threshold Time Duration Value= 55.09 minutes