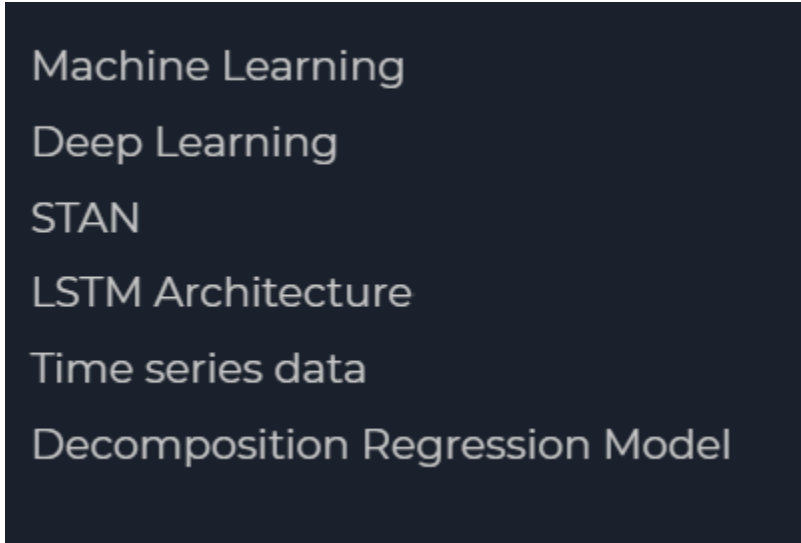Good morning/afternoon everyone my name is Vaibhav Saran and today I would like to present to you Facebook Prophet, the future towards sales forecasting.

Before we begin I would like to highlight some of the prerequisites which are

If you are not familiar with these topics then you might find yourselves a bit lost here.

Moving on let's try to understand what exactly is FB prophet

Prophet is a procedure for forecasting time series data based on an additive model where non-linear trends are fit with yearly, weekly, and daily seasonality, plus holiday effects.Here holiday effects means that during holidays some product experiences increase in sales. It works best with time series that have strong seasonal effects and several seasons of historical data. Prophet is robust to missing data and shifts in the trend, and typically handles outliers well.

❖ Ideally a continuous dataset is desired, but the prophet will be able to impute a certain amount of data to avoid giant gaps.

Prophet uses Stan for optimization in order to fit a non-linear additive model and generate uncertainty intervals. The advantages they got by using STAN was:

1. STAN does a great job of letting a user separate optimization from the model code.
2. It could share the same core implementation in both python and R.
   Prophet automatically detects changepoints in the time series by specifying a

sequence of potential parameter changes and shrinking the shifts using a Laplace prior. The user is allowed to adjust the flexibility of the model by tuning precision of priors, which is intuitive for most users. At its core, the Prophet procedure is an additive regression model with four main components:
- A piecewise linear or logistic growth curve trend. Prophet automatically detects changes in trends by selecting changepoints from the data.
- A yearly seasonal component modeled using Fourier series.
- A weekly seasonal component using dummy variables.

A user-provided list of important holidays. In layman terms, we can understand it as follows: FBProphet uses decomposable time series model with 3 main components: seasonal, trends, holidays or events affect and error which are combined into this equation:

$$f(x) = g(x) + s(x) + h(x) + e(t)$$

FBProphet uses time as a regressor and tries to fit several linear and nonlinear functions of time as components. By default, FBProphet will fit the data using a linear model but it can be changed to the nonlinear model (logistics growth) from its arguments.

Talking about the constraints that FB prophet offers is (*SEE PPT*)

(Slide change)
Now for a basic understanding we will be seeing some graphs and data generated in forecast by FBProphet on Tesla toy data set.
(*SEE PPT*)