

FUTURE SALES PREDICTION

Forecast prediction is predicting a future value using past values and many other factors. In this tutorial, we will create a sales forecasting model using the Keras functional API.

Sales forecasting

It is determining present-day or future sales using data like past sales, seasonality, festivities, economic conditions, etc.

So, this model will predict sales on a certain day after being provided with a certain set of inputs.

In this model 8 parameters were used as input:

1. past seven day sales
2. day of the week
3. date – the date was transformed into 3 different inputs
4. season
5. Festival or not
6. sales on the same day in the previous year

How does it work?

First, all inputs are preprocessed to be understandable by the machine. This is a linear regression model based on supervised learning, so the output will be provided along with the input. Then inputs are then fed to the model along with desired output. The model will plot(learn) a relation(function) between the input and output. This function or relation is then used to predict the output for a specific set of inputs. In this case, input parameters like date and previous sales are labeled as input, and the amount of sales is marked as output. The model will predict a number between 0 and 1 as a sigmoid function is used in the last layer. This output can be multiplied by a specific number(in this case, maximum sales), this will be our corresponding sales amount for a certain day. This output is then provided as input to calculate sales data for the next day. This cycle of steps will be continued until a certain date arrives.

Required packages and Installation

1. numpy
2. pandas
3. keras
4. tensorflow
5. csv
6. matplotlib.pyplot

- Python3

```
import pandas as pd                # to extract data from
dataset(.csv file)

import csv                         #used to read and write
to csv files

import numpy as np                #used to convert input
into numpy arrays to be fed to the model

import matplotlib.pyplot as plt    #to plot/visualize sales
data and sales forecasting

import tensorflow as tf            # acts as the framework
upon which this model is built

from tensorflow import keras       #defines layers and
functions in the model
```

```
#here the csv file has been copied into three lists to allow  
better availability
```

```
list_row,date,traffic =  
get_data('/home/abh/Documents/Python/Untitled  
Folder/Sales_dataset')
```

The use of external libraries has been kept to a minimum to provide a simpler interface, you can replace the functions used in this tutorial with those already existing in established libraries.

Original data set for sales data for 5 years:

