

Introduction to Time Series

Which of these is Time Series?

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- Customer activities with the bank - Will the Customer Churn?

Customer_id	Gender	Occupation	Monthly Charges	Income	Customer Support	Churn?
213464	M	Salaried	35,000	80,000	yes	1
134647	F	self-employed	64,970	170,000	no	0
783490	F	self-employed	49,001	90,000	no	1
367984	M	Salaried	22,070	182,000	yes	0
234550	M	Salaried	71,569	194,000	no	0
235787	M	Salaried	27,890	74,000	no	1

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Which of these is Time Series?

- Customer activities with the bank - Will the Customer Churn?
- Stock Prices for a company for three years

	Date	Open	High	Low	Last	Close	Total Trade Quantity	Turnover (Lacs)
0	2018-10-08	208.00	222.25	206.85	216.00	215.15	4642146.0	10062.83
1	2018-10-05	217.00	218.60	205.90	210.25	209.20	3519515.0	7407.06
2	2018-10-04	223.50	227.80	216.15	217.25	218.20	1728786.0	3815.79
3	2018-10-03	230.00	237.50	225.75	226.45	227.60	1708590.0	3960.27
4	2018-10-01	234.55	234.60	221.05	230.30	230.90	1534749.0	3486.05

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What is Time Series?

A series of values of a quantity indexed in time order, usually observed at equal interval of time.

What is different in Time Series?

- Has a date-time component

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Loan ID	Date	Income per month	Loan type	Loan amount
ID207	15/07/18	25000	Car Loan	1000000
ID190	15/07/18	50000	Home Loan	2500000
ID007	22/07/18	70000	Personal Loan	1500000
ID433	29/07/18	45000	Education Loan	4500000
ID204	29/07/18	20000	Education Loan	5000000
ID611	08/08/18	80000	Business Loan	9000000
ID947	17/08/18	60000	Personal Loan	3700000
ID200	21/08/18	20000	Car Loan	500000
ID222	29/08/18	30000	Personal Loan	4300000

Month	#Passengers
1949-01	112
1949-02	118
1949-03	132
1949-04	129
1949-05	121
1949-06	135
1949-07	148
1949-08	148
1949-09	136
1949-10	119
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Thank You

Applications of Time Series

What is Time Series?

A series of values of a quantity indexed in time order, usually observed at equal interval of time.

Why to study Time Series?

Travel
Industries

Manufacturing
industry

Finance

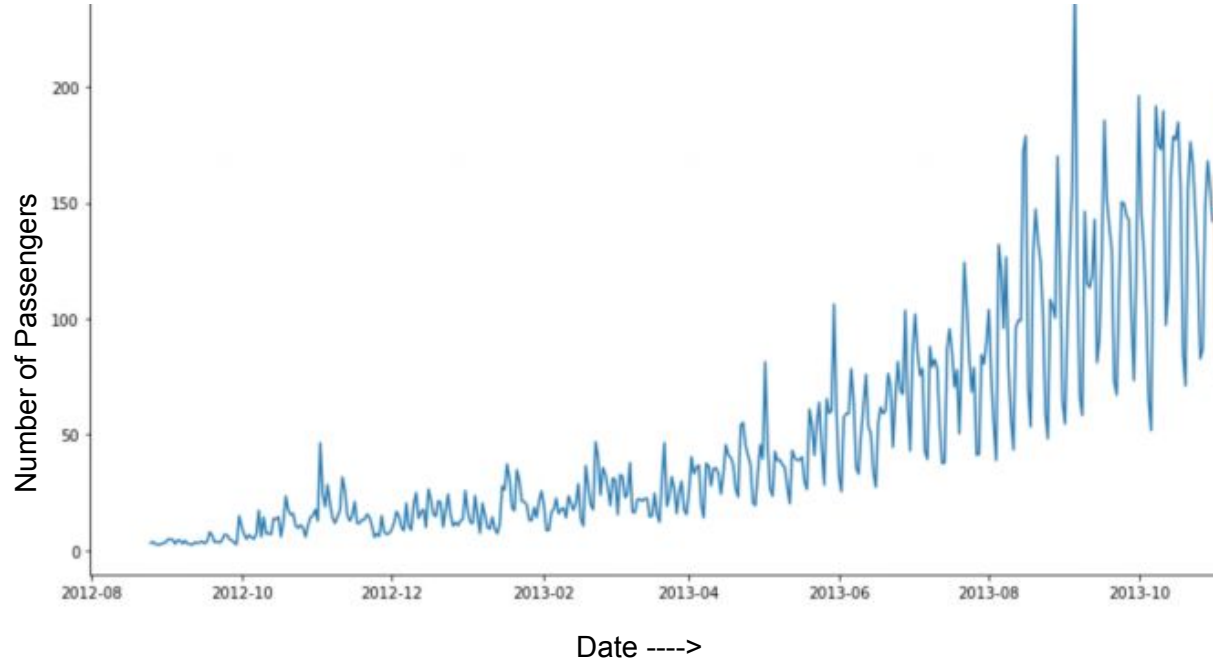
e-learning

Power Industry

Why to study Time Series?

Airline industries

Number of passengers
booking a particular
airline



Why to study Time Series?

Airlines industries

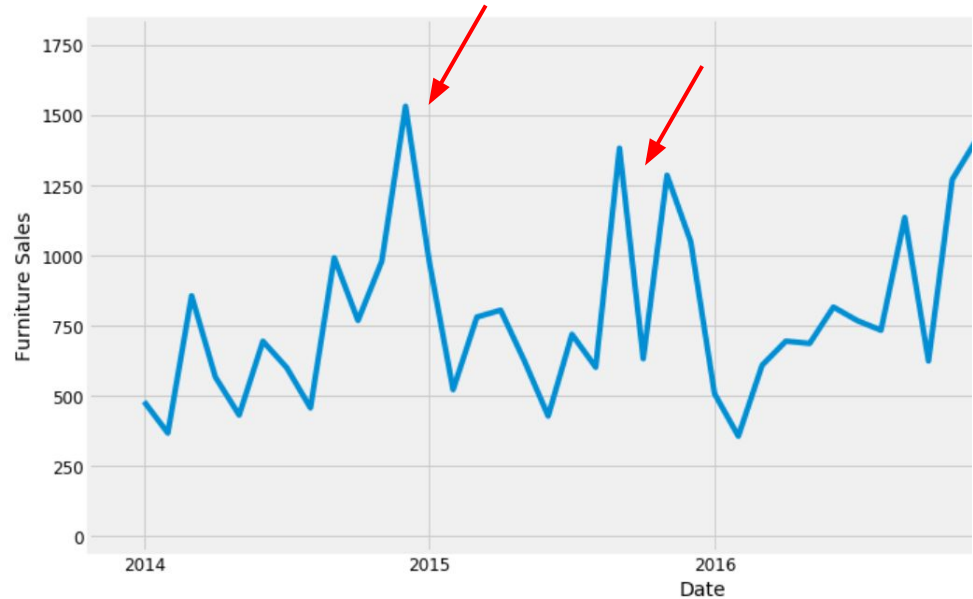
Number of passengers
booking a particular
airline

SUN	MON	TUE	WED	THU	FRI	SAT
1 ₹ 4,994	2 ₹ 4,993	3 ₹ 4,993	4 ₹ 4,993	5 ₹ 4,994	6 ₹ 4,994	7 ₹ 4,994
8 ₹ 4,788	9 ₹ 4,993	10 ₹ 4,993	11 ₹ 4,994	12 ₹ 4,880	13 ₹ 4,736	14 ₹ 4,880
15 ₹ 4,993	16 ₹ 4,257	17 ₹ 4,257	18 ₹ 4,994	19 ₹ 4,994	20 ₹ 4,600	21 ₹ 4,880
22 ₹ 4,257	23 ₹ 4,994	24 ₹ 4,994	25 ₹ 4,257	26 ₹ 4,257	27 ₹ 4,257	28 ₹ 4,257
29 ₹ 4,257	30 ₹ 4,257					

Why to study Time Series?

Manufacturing industry

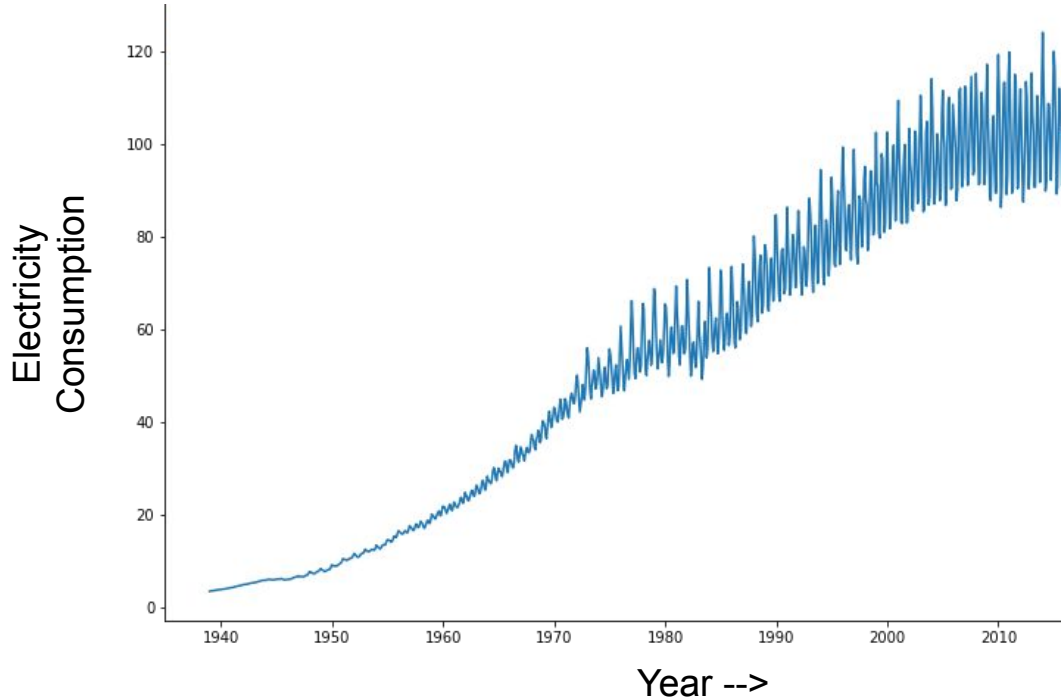
Number of sales in the past three years?



Why to study Time Series?

Power Industry

Amount of electricity
consumption of an area



Why to study Time Series?

e-learning

Observing and predicting the website traffic



Why to study Time Series?

Finance

Opening/Closing price
of stocks



Why to study Time Series?

Manufacturing
industry

Finance

Power Industry

e-learning

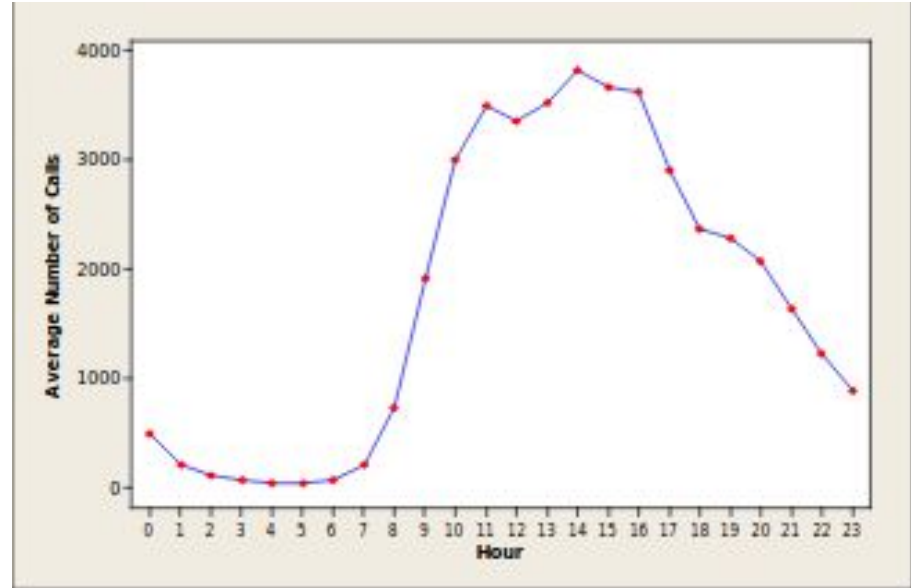
Travel
Industries

Thank You

Why to study Time Series?

Customer Support

Number of calls per day
at a call center



Which of these is Time Series?

- Will Customer X buy a particular product?
 - Based on historical transactions made by him/her
 - Previous visits on website pages/ products by him/her
- What would be the closing stock price for a company, for the next week?
 - Based on the stock price observed in the past month
- Estimate the number of room bookings for hotel ABC in the next month
 - Based on the number of bookings done in past 2 years
 - Considering the hotel price, offers/discounts

