

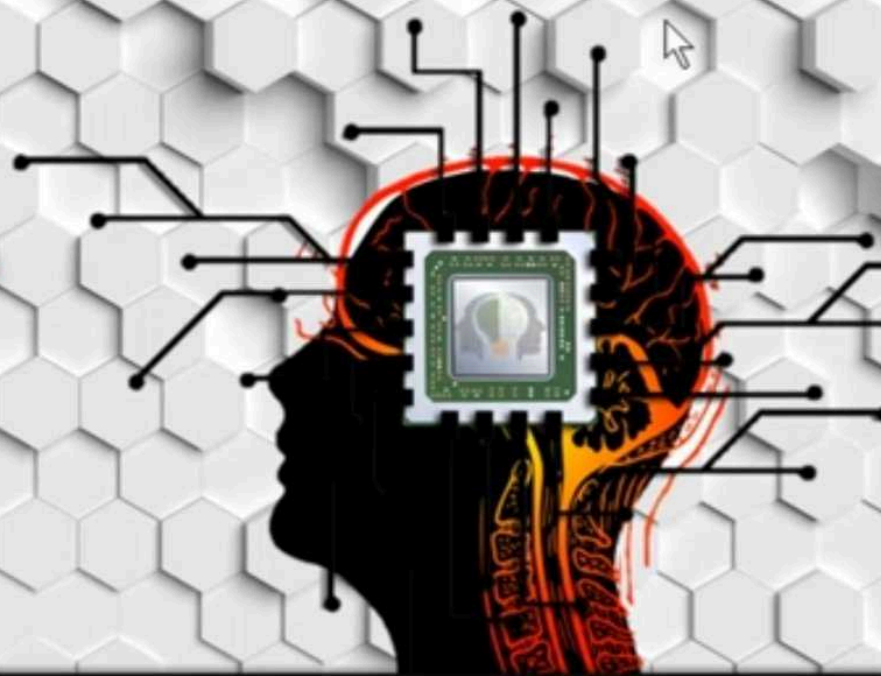
**Data Preprocessing  
Feature Engineering**

**&**

**Tutorial**

**E / हिं**

**Variable  
&  
It's Type**



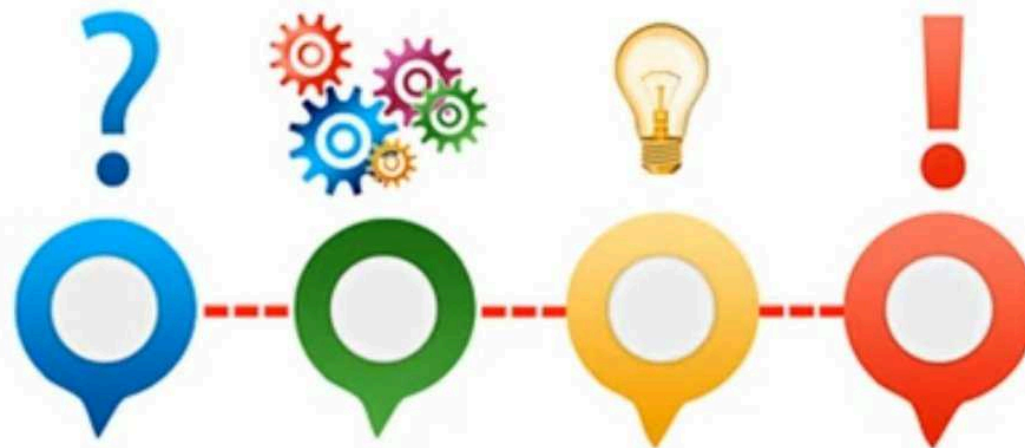
**Machine Learning & Data Science: Hands-on Python Course in Hindi**

# What is Variable?

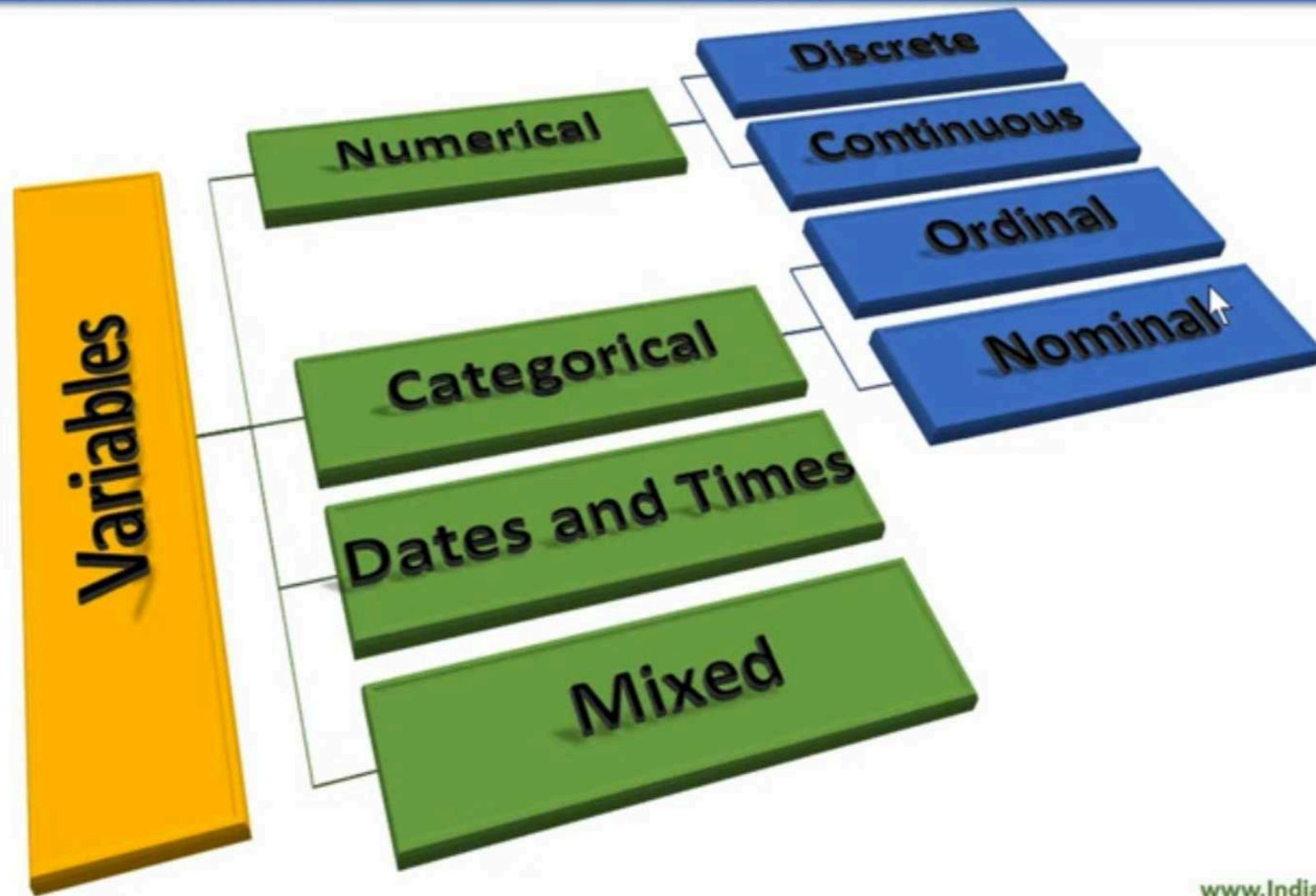
Suggested: Data Preprocessing Techniques/Steps in Detail [Hin



- A **variable** is any characteristic, number, or quantity that can be measured or counted.



# What are the type of variable?





# What is Numerical Variable ?



- A numerical variable is a variable where the measurement or number has a numerical meaning.

Age	Weight in KG	Income	No. of Vehicles	Percentage
23	92.2	59,00,000	2	90.83
12	41.3	5000	1	62.00
34	80.9	3,50,000	5	65.00
26	78.0	10,00,000	1	80.01
15	35.9	10,000	1	72.06
38	105.0	89,16,000	3	99.99



# What is Discrete Variable?



- The value which can be counted as whole value(fixed) called as **discrete variable**.
- Ex. 1, 45, 73, 23 not 23.4, 56.76, 3.04
- Integer Value

Age	Income	No. of Vehicles
23	59,00,000	2
12	5,000	1
34	3,50,000	5
26	10,00,000	1
15	10,000	1
38	89,16,000	3



# What is Continuous Variable?



- The value contain range, measurements called as **continuous variable**.
- Ex. 1.3, 4.5, 73.67, 20.3 not 23, 56, 3
- Floating Value

Weight in KG	Temperature	Percentage
92.2	45.30	90.83
41.3	101.00	62.00
80.9	43.00	65.00
78.0	36.9	80.01
35.9	10.5	72.06
105.0	71.82	99.99



# What is Categorical Variable ?



- The values of a categorical variable are selected from a group of categories, also called labels.

Grade	Quality	Days	Products	Language
A	Poor	Monday	Laptop	Python
B	Good	Tuesday	Bag	Java
C	Very Good	Wednesday	Mouse	C++
D	Excellent	Thursday	Torch	C
E	Extreme Excellent	Friday	Mobile	Go
F	EE ka Bap	Saturday	Shirt	HTML



# What is Ordinal Variables?



- **Ordinal variables** are categorical variable in which the categories can be meaningfully ordered.
- When the ordinal variable convert into the number then it has mathematical value.
- Ex. Rating of product

Grade	Quality	Moths
A	Poor	Jan
B	Good	Feb
C	Very Good	Mar
D	Excellent	Apr
E	Extreme Excellent	May
F	EE ka Bap	Jun





# What is Nominal Variables?



- **Nominal variable** is same like ordinal variable but there is nothing that indicates an intrinsic order of the labels and in principle.
- All labels are equal no order.
- No mathematical value
- Ex. Colour: Red, Green, White, Black

Products	Language
Laptop	Python
Bag	Java
Mouse	C++
Torch	C
Mobile	Go
Shirt	HTML



# Examples of Dates & Times



- App Login/Logout, Click on Ads, Money Withdraw
- System Power On/Off, Baby Born Report, Death Report

Date Only	Time Only	DateTime
Jan-2010	10.15 AM	07-Dec-2020 12.00.00
May-2050	05.00 PM	10-Jun-2020 23.04.00
Sep-3091	19.40 AM	17-Apr-2020 12.00.00
Oct-5050	15.09 PM	20-Oct-2020 23.04.00



# What are Mixed Variables?



- The variables which contains numbers and categories(labels) called as **Mixed Variables**.



Student ID	Percentage
23	A++
12	85
34	Failed
26	Failed
15	90
38	40

