

MACHINE LEARNING- APPLICATIONS, TYPES OF DATA, TYPES OF ML

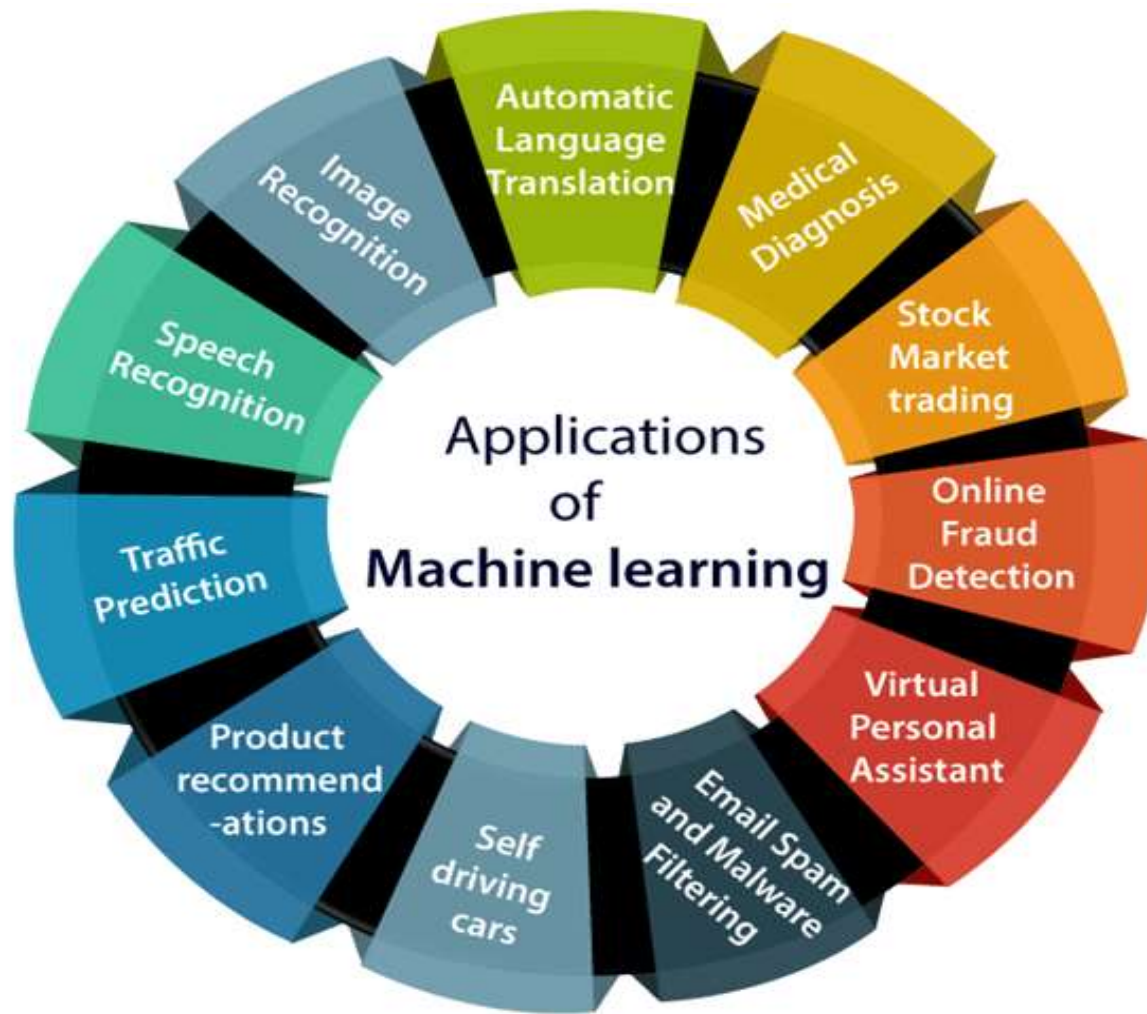
B.Sc. 5th Sem (Paper Code: DSE2)

Paulami Basu Ray

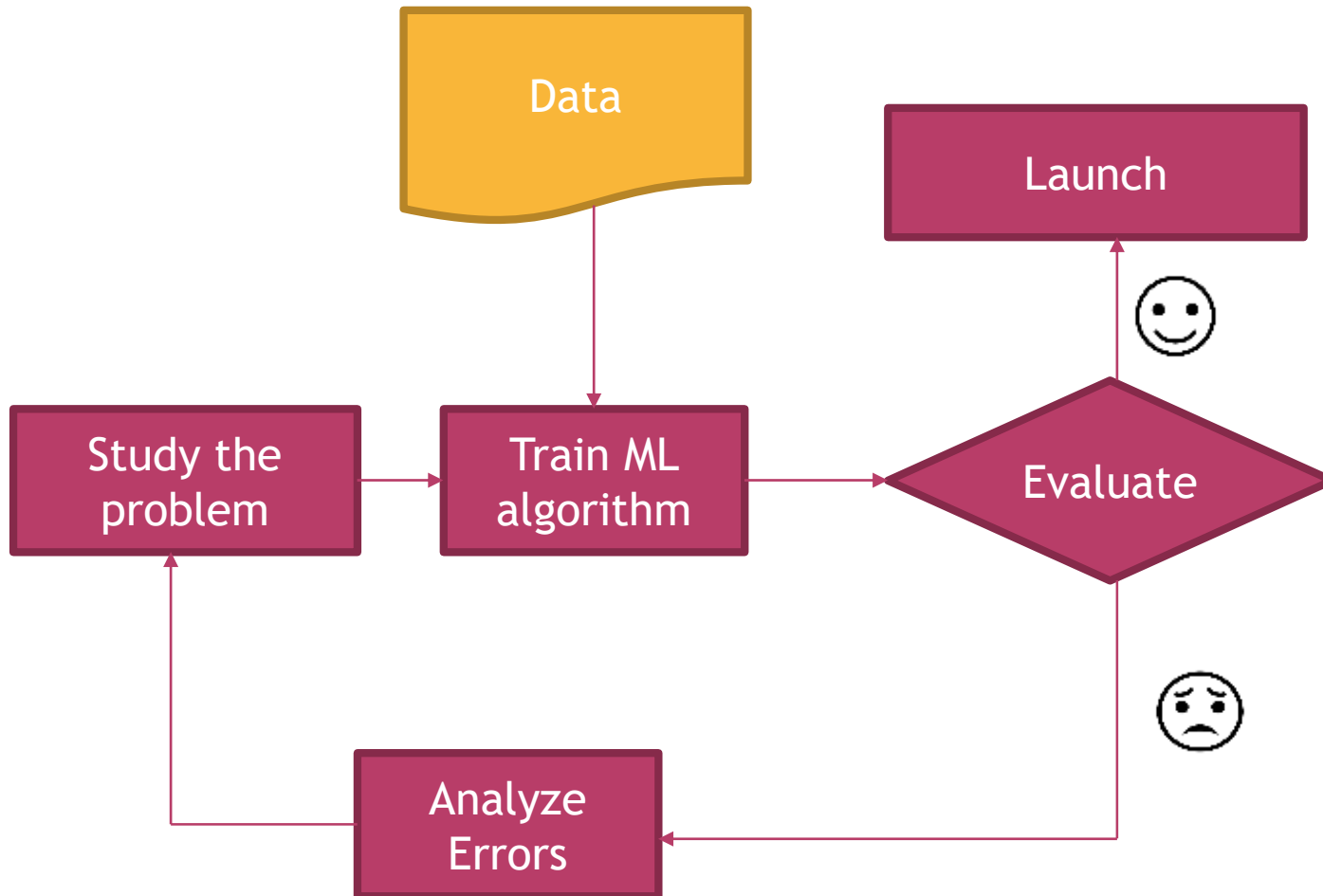
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APPLICATIONS OF ML

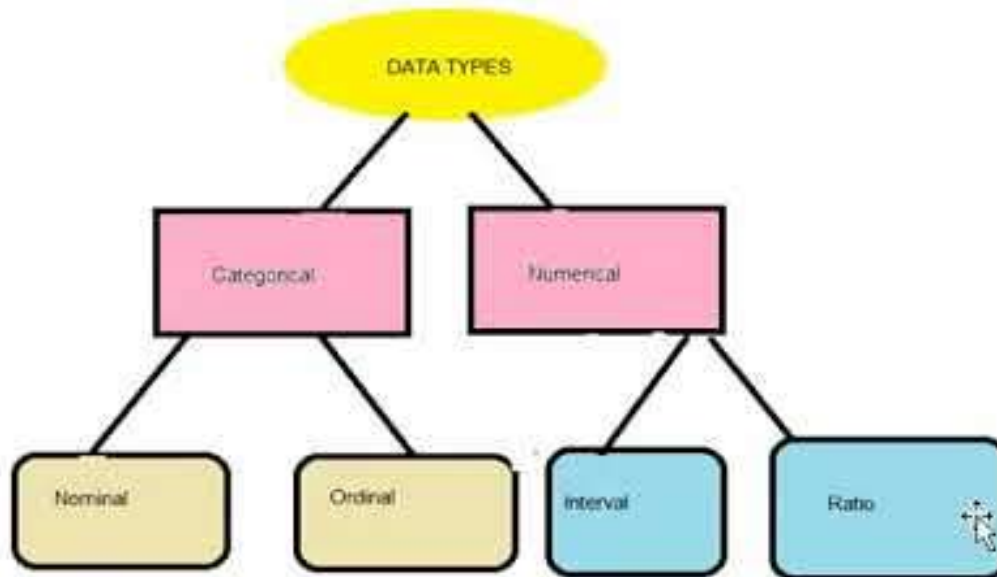


KEY ELEMENTS OF ML



KEY ELEMENTS OF ML- DATA

Types of Data



Numerical Data

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graph TD; A[Numerical Data] --> B(Continuous); A --> C(Discrete); B --- B_text[height, weight, salary, temperature, interest rates]; B --- B_vals[23.45, 45.76, 89.26]; C --- C_text[units sold, number of languages spoken, number of students]; C --- C_vals[33, 56, 78, 12];
```

Continuous

height, weight, salary,
temperature,
interest rates

23.45, 45.76, 89.26

Discrete

units sold, number of
languages spoken,
number of students

33, 56, 78, 12

Categorical

Nominal



Pen



Pencil



Eraser



Cow



Dog



Cat

Ordinal



Excellent



Good



Bad



Fantastic



Okay



Don't Like



Categorical data example

Day	Outlook	Temperature	Humidity	Wind	PlayTennis
D1	Sunny	Hot	High	Weak	No
D2	Sunny	Hot	High	Strong	No
D3	Overcast	Hot	High	Weak	Yes
D4	Rain	Mild	High	Weak	Yes
D5	Rain	Cool	Normal	Weak	Yes
D6	Rain	Cool	Normal	Strong	No
D7	Overcast	Cool	Normal	Strong	Yes
D8	Sunny	Mild	High	Weak	No
D9	Sunny	Cool	Normal	Weak	Yes
D10	Rain	Mild	Normal	Weak	Yes
D11	Sunny	Mild	Normal	Strong	Yes
D12	Overcast	Mild	High	Strong	Yes
D13	Overcast	Hot	Normal	Weak	Yes
D14	Rain	Mild	High	Strong	No

Drink	Type	Calories	Sugars (g)	Caffeine (mg)
Brewed coffee	Hot	4	0	260
Caffè latte	Hot	100	14	75
Caffè mocha	Hot	170	27	95
Cappuccino	Hot	60	8	75
Iced brewed coffee	Cold	60	15	120
Chai latte	Hot	120	25	60

The individuals in this data set are:

(A) Ben's Beans customers

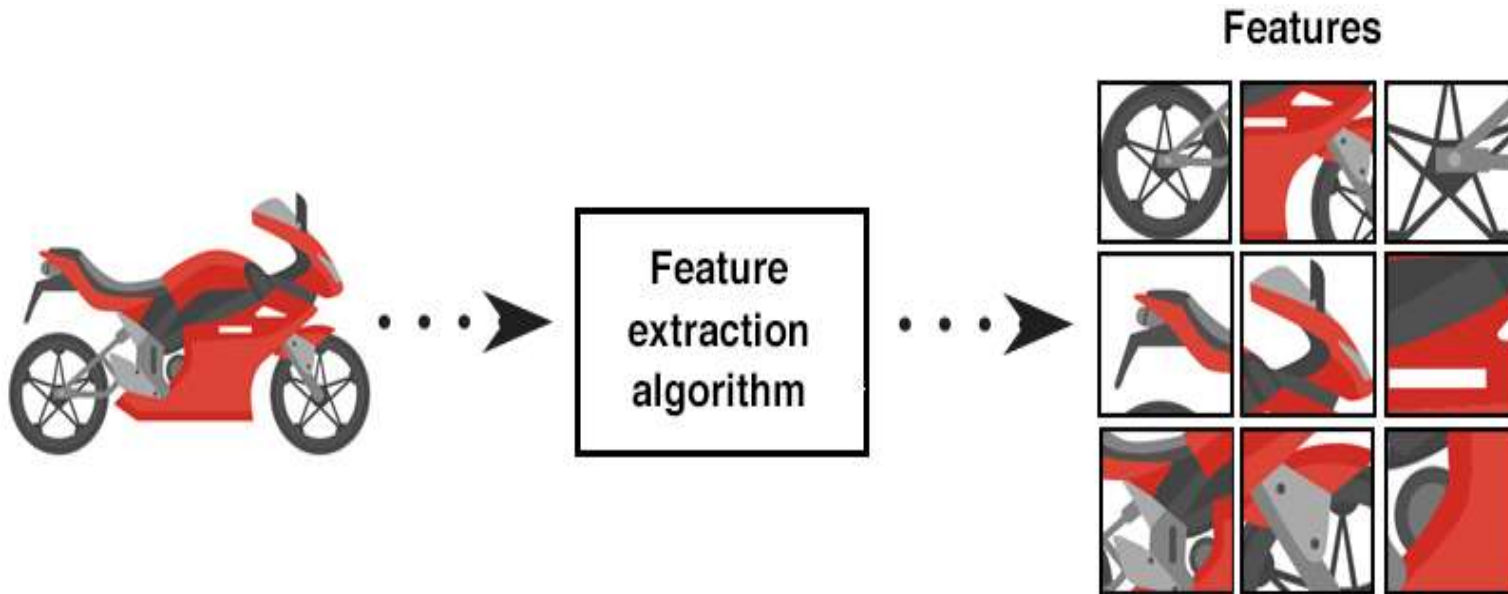
(B) Ben's Beans drinks

This data set contains:

(A) 4 variables, 1 of which is categorical

(B) 4 variables, 2 of which are categorical

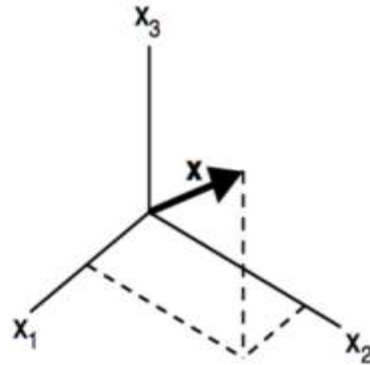
KEY ELEMENTS OF ML- FEATURES



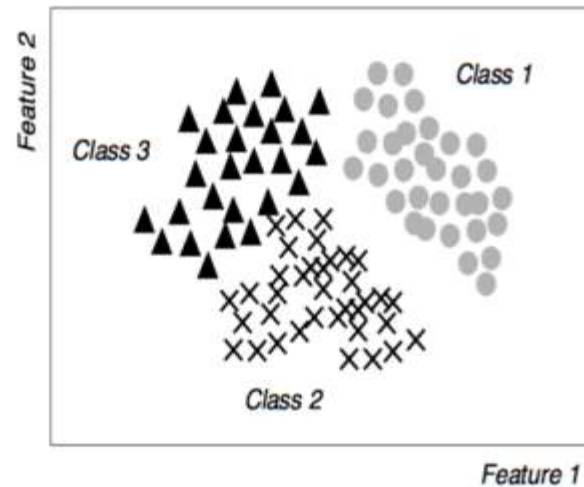
FEATURE VECTOR

$$X = \begin{bmatrix} X_1 \\ X_2 \\ \vdots \\ X_d \end{bmatrix}$$

Feature vector

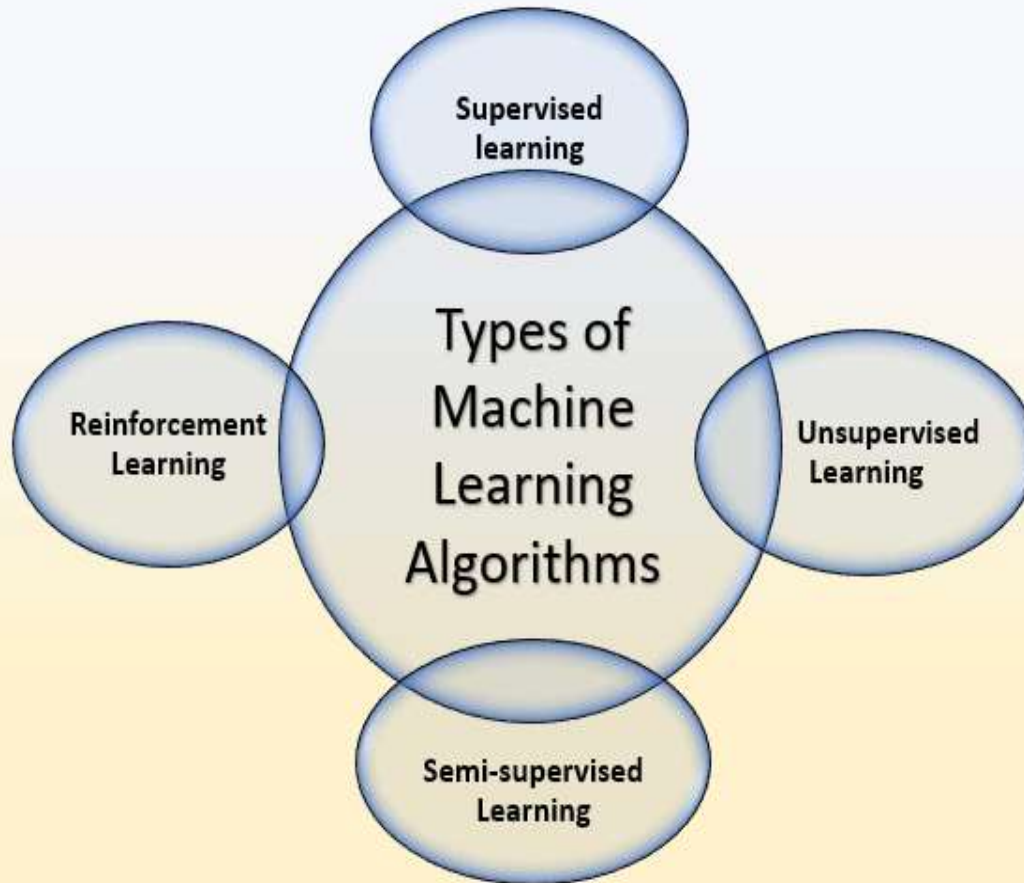


Feature space (3D)

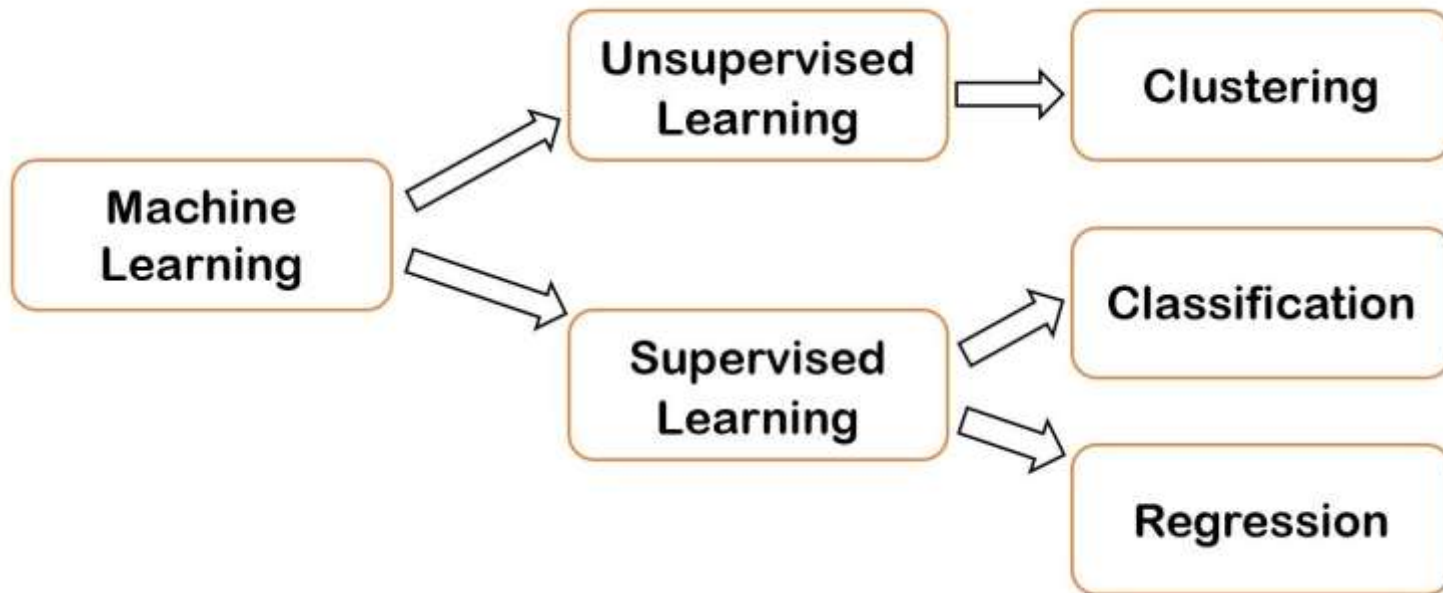


Scatter plot (2D)

TYPES OF ML



SUPERVISED VS UNSUPERVISED LEARNING



REINFORCEMENT LEARNING EXAMPLE

