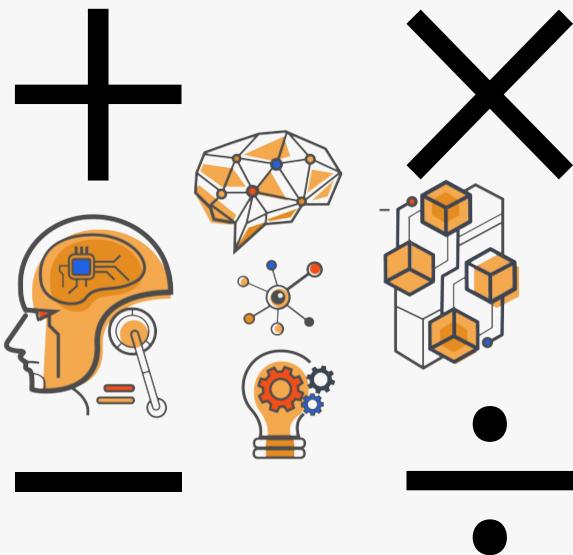


Machine learning

#XDaysofML



Day [of X day)

Dec 2nd, 2022

INTRO TO STAT 101 - SEBASTIAN THRON & ADAM SHERSIN

TEASER

Two types of people

Type A ~ 80 friends $\frac{1}{2}$

Type B - 20 friends $\frac{1}{2}$

Quiz

What are the chances you picked a

type A friend = $\frac{80}{100} = 0.8$

type B friend = $\frac{20}{100} = 0.2$

$$\underbrace{\qquad}_{\text{}} = 1.0$$

In expectation how many friends do you have

$$E(y|A) + E(y|B)$$

y

$$0.8 \times 80 + 0.2 \cdot 20$$

$$\begin{array}{r} 80 \\ \times 81 \\ \hline 64 \\ 640 \\ \hline 29 \times 2^0 \end{array}$$

$$+ 4 = 68 \text{ friends}$$

Teaser video \leftrightarrow proof that you are unpopular

① Average no of friends

② Ex

CONCEPTS

STATS DATA TO DECISIONS

- ① Allows one to make decisions based on data obtained
- ② Decisions are made based by data

Problem: You want to buy a house costing \$92,000. Is this amount too much or too little. Let's look at the data.

Size (ft ²)	Cost (\$)
1400	112,000
2400	192,000
1800	144,000
1900	152,000
1300	104,000
1100	88,000

→ The bigger the house, the higher the cost

Quiz 1

(i) The house you want is 1300ft². How much are you expected to pay?

104,000 ✓

(ii) The area is 1500ft². How much are you expected to pay?

$$1900 = 152,000$$

$$1500 = \cancel{x}$$

$$1300 = 104,000$$

$$\frac{1900 - 1300}{1500 - 1300} = \frac{152,000 - 104,000}{x - 104,000}$$

$$\frac{\cancel{600}}{\cancel{200}} = \frac{48}{x - 104,000}$$

$$3(x - 104,000) = 48$$

$$3x - 312 = 48$$

$$\nwarrow = \frac{48 + 312}{3}$$

$$x = 120,000$$

For 1500 ft², I am expected to pay
120,000 \$

For 1800 ft², expected to pay 144,000 \$

For 2100 ft²

$$2400 \text{ ft}^2 = 192,000$$

$$2100 \text{ ft}^2 = x$$

$$1800 = 144,000$$

$$\frac{2400 - 1800}{2100 - 1800} = \frac{192,000 - 144,000}{x - 144,000}$$

$$\frac{2400}{300} = \frac{48,000}{x - 144,000}$$

$$2x - 288 = 48,000$$

$$2x = 336,000$$

$$x = 168,000$$

For 2100 ft^2 , you are expected
to pay $165,000\text{\$}$

Another way to answer,

2100 ft^2 is halfway of

2400 ft^2 and 1800 ft^2 ,

meaning it's price will

be the average of both

prices

$$\frac{192 + 144}{2} = 168$$

$(168,000\text{\$})$

What is the cost of
home per sq ft.

$$\text{If } 1400 \text{ ft}^2 = \$12,000$$

Then $1 = x$

$$\frac{\$12,000}{1400} =$$

$$x = \$80$$

Unit 2

Size	Price	Price/sq ft
1400	98 000	70
2400	168 000	70
1800	126 000	70
1900	133 000	70
1400	91 000	65
1100	77,000	70



→ Is there a

fixed dollar amount per square
foot?

Yes No

DA quick look @ the data shows 8 hours of the same size with diff. prices.

-> I Didn't need to work it out if I had just looked @ the data

Now for
•  $1300 \text{ ft}^2 \rightarrow \$1,000$
Is there a fixed dollar amount per square foot?
Yes No