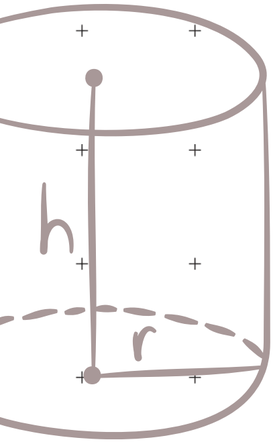
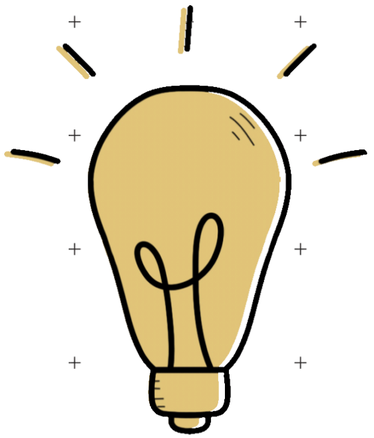
RISK ASSESSMENT BY INSURANCE FIRMS

APPLIED MATHS PROJECT





Start Now

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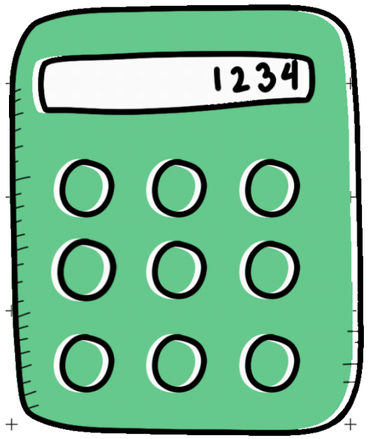
WHAT IS THE TOPIC ABOUT:

HOW DO INSURANCE FIRMS ASSESS THE THE RISK OF THEIR POLICY HOLDERS

IN A BIRDS EYE VIEW:_

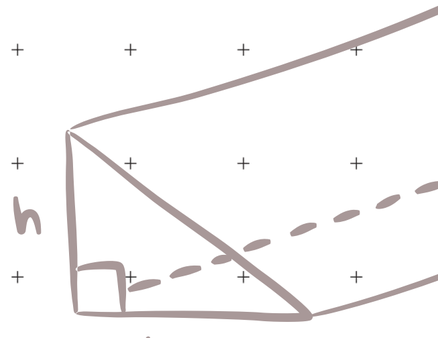


- BY DOING CALCULATIONS ON PAST DATA

MAIN CONCEPTS USED

- PROBABILITY DISTRIBUTIONS
- DESCRIPTIVE STATISTICS

ALSO HAS LIMITATIONS DONE BY KEEPING MANY THINGS CONSTATNT SUCH AS NOT CONSIDERING THE HEALTH CONDITIONS OF THE POLICY HOLDERS

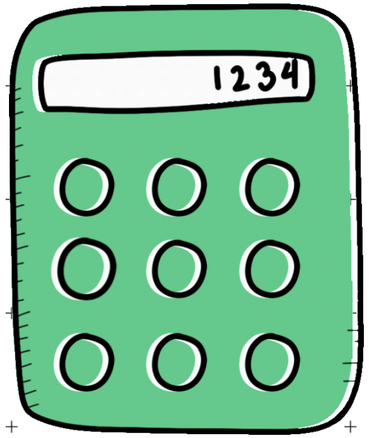


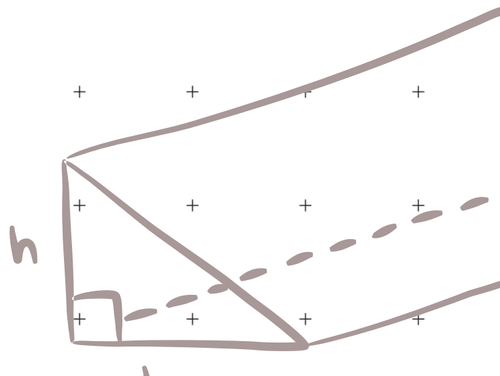
PROBABILITY DISTRIBUTIONS

- BINOMIAL DISTRIBUTION
- POISSON DISTRIBUTION
- NORMAL DISTRIBUTION

DESCRIPTIVE STATISTICS

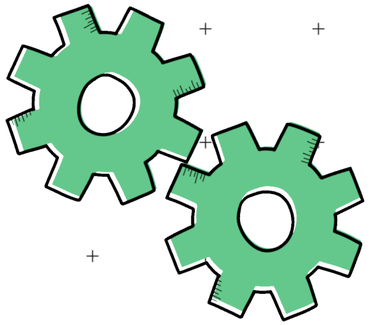
- MEAN , MEDIAN , MODE
- VARIANCE & STANDARD DEVIATION

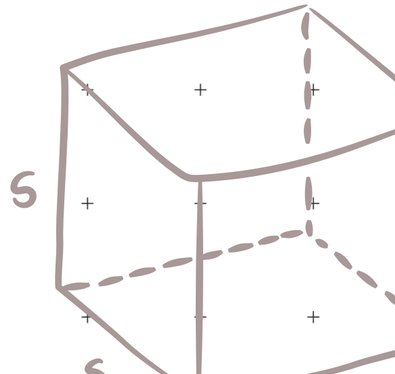




RESEARCH QUESTION:

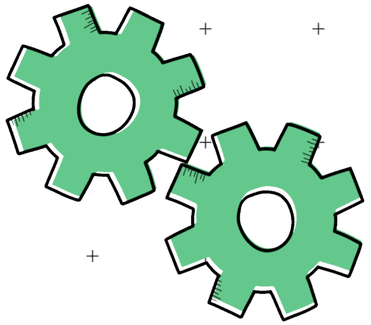
HOW DO INSURANCE FIRMS UTILIZE DESCRIPTIVE STATISTICS AND PROBABILITY DISTRIBUTIONS TO ANALYZE DATA, PREDICT POTENTIAL RISKS, AND DETERMINE FAIR PREMIUMS FOR POLICYHOLDERS?



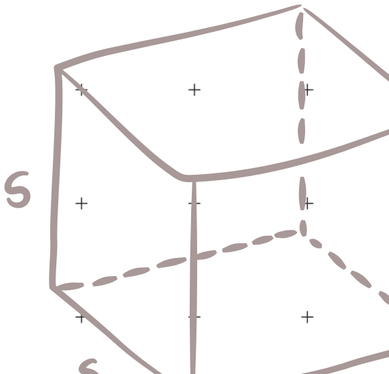


FACTORS CONSIDERED:

- HEALTH SCORE
- CLAIM FREQUENCY



DATA SET CHOSEN HAS DETAILS OF 25 POLICYHOLDERS GIVEN THEIR AGE AND HEALTH SCORE(1-10) AND THEIR CLAIM FREQUENCY



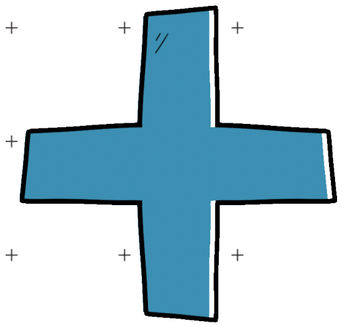
AFTER DOING THE CALCULATIONS:

CENTRAL TENDENCY RESULTS

- MEAN AGE: 39.32 YEARS
- MEDIAN AGE: 38 YEARS
- MODE AGE: 25 YEARS

DISPERSION MEASURES

- AGE RANGE: 30 YEARS
- HEALTH SCORE MEAN: 6.72
- CLAIM FREQUENCY MEAN: 2.36



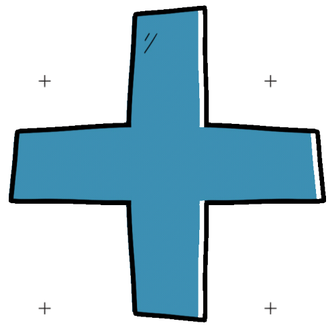
$$x = \frac{-b \pm \sqrt{b^2 -}}{2a}$$

ANALYSIS USING PROBABILITY DISTRIBUTIONS:

- POISSON DISTRIBUTION
  - USED FOR MODELING CLAIM FREQUENCY
  - REFLECTS THE LIKELIHOOD OF CLAIMS OCCURRING OVER A PERIOD
- NORMAL DISTRIBUTION
  - APPLIED TO AVERAGE CLAIM AMOUNTS
  - REPRESENTS THE SYMMETRICAL SPREAD OF CLAIM AMOUNTS AROUND THE MEAN

AFTER THE CALCULATIONS
THE RESULTS WERE

- MOST POLICYHOLDERS FILE 1-2 CLAIMS ANNUALLY, AND AVERAGE CLAIM AMOUNTS CLUSTER AROUND ₹7300.



$$x = \frac{-b \pm \sqrt{b^2 -}}{2a}$$

NOW SAY WE HAVE A NEW POLICY HOLDER AND WE NEED TO ASSESS HIS RISK USING THE DATASET AVAILABLE WITH US

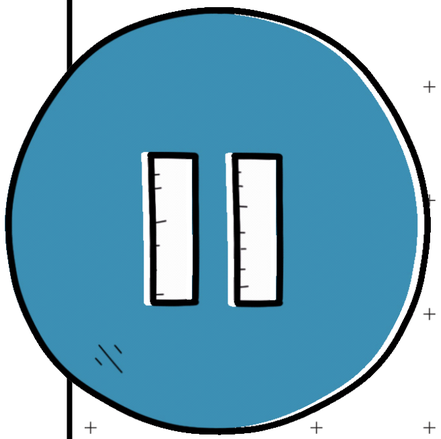
THE DETAILS OF THE NEW POLICY HOLDER:

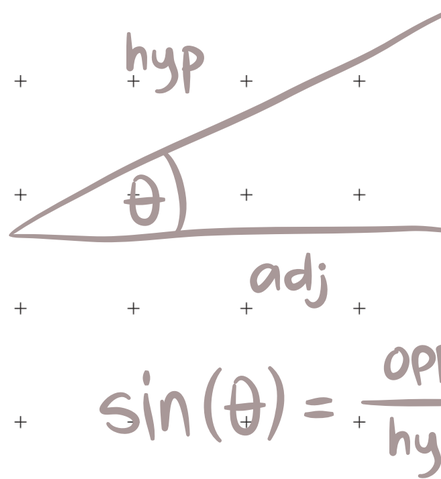
AGE:-43 YEARS

HEALTH SCORE:6

ESTIMATED CLAIM FREQUENCY:3

ESTIMATED AVERAGE CLAIM AMOUNT:8500/-

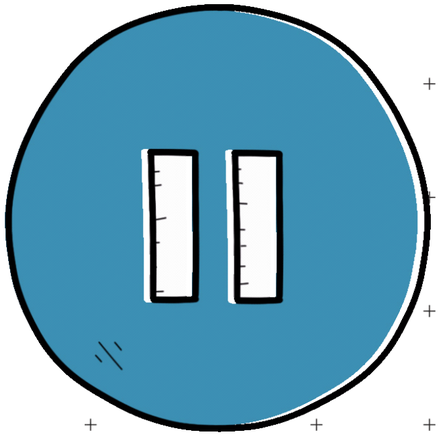


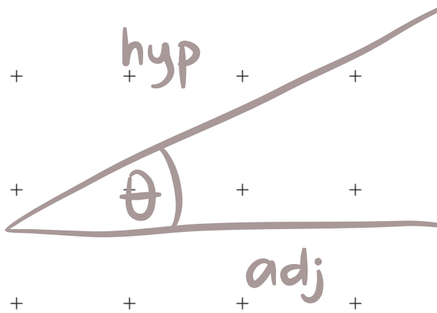


THIS DATA ALIGNS WITH POISSON DISTRIBUTION AFTER CALCULATING :

IT INDICATES MODERATE RISK AS THE AGE OF THE NEW POLICYHOLDER IS HIGHER THAN THE MEAN AGE HAS AN AVERAGE HEALTH RISK

CLAIM AMOUNT : EXCEEDS THE DATASET MEAN (₹7300), INDICATING GREATER POTENTIAL FINANCIAL LIABILITY.

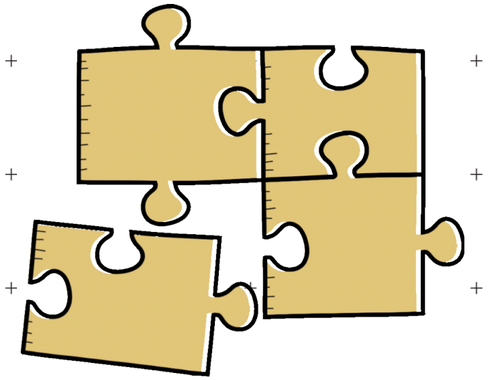


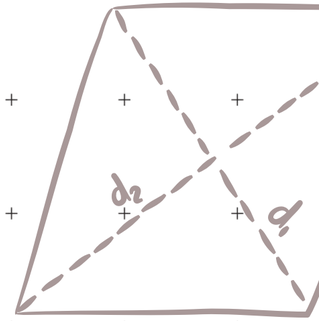


$\sin(\theta) = \frac{opp}{hyp}$

- POISSON DISTRIBUTION: A CLAIM FREQUENCY OF 3 EXCEEDS THE AVERAGE $\lambda = 2.36$, IMPLYING A HIGHER PROBABILITY OF FREQUENT CLAIMS.

- NORMAL DISTRIBUTION: ₹8500 SITS ABOVE THE MEAN, ALIGNING WITH THE TAIL OF THE DISTRIBUTION, SUGGESTING LESS FREQUENT BUT MORE COSTLY CLAIMS.

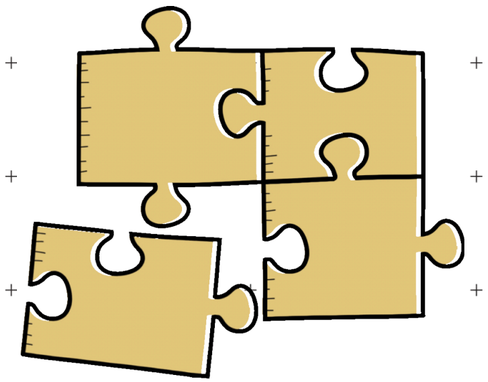


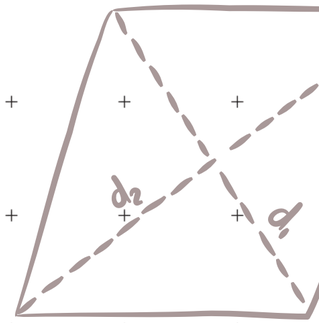


RISK LEVEL

- OVERALL RISK: HIGH, DUE TO BOTH INCREASED CLAIM FREQUENCY AND HIGHER-THAN-AVERAGE CLAIM AMOUNTS.

- PREMIUM IMPACT: JUSTIFIES A HIGHER PREMIUM DUE TO INCREASED FINANCIAL EXPOSURE.





CONCLUSION:

- DESCRIPTIVE STATISTICS AND PROBABILITY DISTRIBUTIONS EFFECTIVELY ASSESS RISK PROFILES AND GUIDE PREMIUM SETTINGS.
- THE NEW POLICYHOLDER POSES A HIGH RISK, WARRANTING CAREFUL PREMIUM ADJUSTMENTS AND TARGETED RISK REDUCTION STRATEGIES.