50 questions on eco statistics:

1. What is the formula for calculating the mean (average) of a dataset?
2. How is the median calculated in statistics?
3. What is the formula for calculating the variance of a dataset?
4. How is the standard deviation calculated and what does it represent?
5. What is the formula for calculating the covariance between two variables?
6. How is the correlation coefficient calculated and interpreted?
7. What is the formula for calculating the coefficient of determination (R-squared)?
8. How is the t-test used to compare means of two groups?
9. What is the formula for calculating the p-value in hypothesis testing?
10. How is the chi-square test used to analyze categorical data?
11. What is the formula for calculating the confidence interval for a population mean?
12. How is the F-test used in ANOVA (analysis of variance)?
13. What is the formula for calculating the marginal propensity to consume (MPC)?
14. How is the Engel curve used to analyze income elasticity of demand?
15. What is the formula for calculating the price elasticity of demand?
16. How is the Herfindahl-Hirschman Index (HHI) calculated in market concentration analysis?
17. What is the formula for calculating the present value of future cash flows?
18. How is the net present value (NPV) of an investment project calculated?
19. What is the formula for calculating the internal rate of return (IRR)?
20. How is the coefficient of variation calculated and interpreted?
21. What is the formula for calculating the least squares regression line?
22. How are dummy variables used in regression analysis?
23. What is the formula for calculating the Durbin-Watson statistic?
24. How is the Box-Cox transformation used in data normalization?
25. What is the formula for calculating the autoregressive (AR) model?
26. How is the autoregressive moving average (ARMA) model defined?
27. What is the formula for calculating the autoregressive integrated moving average (ARIMA) model?
28. How is the autoregressive conditional heteroscedasticity (ARCH) model used in volatility analysis?
29. What is the formula for calculating the Hurst exponent in time series analysis?
30. How is the Markov chain model used in analyzing economic transitions?
31. What is the formula for calculating the cost-benefit ratio?
32. How is the benefit-cost ratio calculated in cost-benefit analysis?
33. What is the formula for calculating the Herfindahl index in market concentration analysis?
34. How is the Laspeyres index used to calculate price inflation?
35. What is the formula for calculating the simple interest rate?
36. How is the compound interest formula derived?
37. What is the formula for calculating the discount factor in present value calculations?
38. How is the Engel coefficient calculated and interpreted in income distribution analysis?
39. What is the formula for calculating the marginal propensity to save (MPS)?
40. How is the coefficient of variation used to compare the variability of different datasets?
41. What is the formula for calculating the price index in the Paasche index method?
42. How is the geometric mean calculated and when is it used?
43. What is the formula for calculating the exponential growth rate?
44. How is the Lorenz curve graph constructed and interpreted?
45. What is the formula for calculating the concentration ratio in market analysis?
46. How is the coefficient of elasticity calculated and interpreted?
47. What is the formula for calculating the money multiplier in monetary economics?
48. How is the Phillips curve equation defined and interpreted?
49. What is the formula for calculating the disposable income in national accounts?
50. What is the mean of a dataset denoted as μ and calculated as μ = (Σx) / n?
51. How is the median denoted as Me and calculated for an ordered dataset?
52. What is the variance denoted as σ^2 and calculated as σ^2 = Σ((x - μ)^2) / n?
53. How is the standard deviation denoted as σ and calculated as σ = √(σ^2)?
54. What is the covariance between two variables denoted as Cov(X, Y) and calculated as Cov(X, Y) = Σ((x - μx)(y - μy)) / n?
55. How is the correlation coefficient denoted as r and calculated as r = Cov(X, Y) / (σx \* σy)?
56. What is the coefficient of determination (R-squared) denoted as R^2 and calculated as R^2 = r^2?
57. How is the t-test denoted as t and calculated as t = (x̄ - μ) / (s / √n)?
58. What is the p-value denoted as p and represents the probability of obtaining a test statistic as extreme as the observed, assuming the null hypothesis is true?
59. How is the chi-square test statistic denoted as χ^2 and calculated based on the difference between observed and expected frequencies in categorical data?
60. What is the confidence interval denoted as CI and calculated as CI = x̄ ± (t \* (s / √n))?
61. How is the F-test used to compare the variances of two groups?
62. What is the marginal propensity to consume (MPC) denoted as MPC and represents the change in consumption for a given change in income?
63. How is the Engel curve denoted as E and used to analyze income elasticity of demand?
64. What is the price elasticity of demand denoted as PED and calculated as PED = (% change in quantity demanded) / (% change in price)?
65. How is the Herfindahl-Hirschman Index (HHI) denoted as HHI and calculated as HHI = Σ(s^2) for all firms in an industry?
66. What is the present value (PV) denoted as PV and calculated as PV = C / (1 + r)^t, where C represents the future cash flow, r is the discount rate, and t is the time period?
67. How is the net present value (NPV) denoted as NPV and calculated as NPV = Σ(C / (1 + r)^t) - Initial Investment?
68. What is the internal rate of return (IRR) denoted as IRR and represents the discount rate that makes the NPV of an investment zero?
69. How is the coefficient of variation (CV) denoted as CV and calculated as CV = (σ / μ) \* 100?
70. What is the least squares regression line denoted as ŷ and calculated using the formula ŷ = a + bx, where a represents the intercept and b represents the slope?
71. How are dummy variables denoted as D and used in regression analysis to represent categorical variables?
72. What is the Durbin-Watson statistic denoted as DW and calculated as DW = Σ((e\_t - e\_{t-1})^2) / Σ(e\_t^2), where e\_t represents the residual at time t?
73. How is the Box-Cox transformation denoted as λ and used to normalize data by applying the transformation formula: (y^λ
74. How is the Box-Cox transformation denoted as λ and used to normalize data by applying the transformation formula: (y^λ - 1) / λ, where y represents the original data?
75. What is the autoregressive (AR) model denoted as AR(p) and represented as y\_t = β\_0 + β\_1 \* y\_{t-1} + ... + β\_p \* y\_{t-p} + ε\_t?
76. How is the autoregressive moving average (ARMA) model denoted as ARMA(p, q) and represented as y\_t = β\_0 + β\_1 \* y\_{t-1} + ... + β\_p \* y\_{t-p} + ε\_t + θ\_1 \* ε\_{t-1} + ... + θ\_q \* ε\_{t-q}?
77. What is the autoregressive integrated moving average (ARIMA) model denoted as ARIMA(p, d, q) and represented as (1 - B)^d \* (y\_t - β\_0 - β\_1 \* y\_{t-1} - ... - β\_p \* y\_{t-p}) = ε\_t + θ\_1 \* ε\_{t-1} + ... + θ\_q \* ε\_{t-q}, where B represents the backshift operator?
78. How is the autoregressive conditional heteroscedasticity (ARCH) model denoted as ARCH(p) and represented as σ\_t^2 = α\_0 + α\_1 \* ε\_{t-1}^2 + ... + α\_p \* ε\_{t-p}^2?
79. What is the Hurst exponent denoted as H and represents the measure of long-term memory in a time series, calculated using the rescaled range (R/S) analysis?
80. How is the Markov chain model denoted as {X\_t} and characterized by the transition probabilities P(X\_t = j | X\_{t-1} = i)?
81. What is the cost-benefit ratio denoted as CBR and calculated as CBR = (Total Benefits) / (Total Costs)?
82. How is the benefit-cost ratio denoted as BCR and calculated as BCR = (Total Present Value of Benefits) / (Total Present Value of Costs)?
83. What is the Herfindahl index denoted as H and calculated as H = Σ(s\_i)^2 for all firms in an industry, where s\_i represents the market share of each firm?
84. How is the Laspeyres index denoted as L and used to calculate price inflation by comparing the total expenditure on a fixed basket of goods at current prices to a base year?
85. What is the simple interest rate denoted as r and calculated as r = (I / P) \* 100, where I represents the interest and P is the principal amount?
86. How is the compound interest calculated using the formula A = P \* (1 + r/n)^(nt), where A represents the final amount, P is the principal, r is the interest rate, n is the number of compounding periods per year, and t is the number of years?
87. What is the discount factor denoted as DF and represents the present value of a future cash flow, calculated as DF = 1 / (1 + r)^t, where r is the discount rate and t is the time period?
88. How is the Engel coefficient denoted as EC and calculated as EC = (E / Y) \* 100, where E represents the expenditure on a specific good or category, and Y