Exam 4 Theory

There are 3 possible relationships between variables X and Y

· Linear L or L · Non-Linear W M W etc.

· No Relationship |-

 $y = \beta_0 + \beta_1 x + \epsilon$ $y = \beta_0 + \beta_1 x + \epsilon$ $y = \beta_0 + \beta_1 x + \epsilon$

There are 2 models to know:

- o Population Linear Model the total
- o Linear Regression Model the
 - This is what we are calculating/working with
- Model notations:

o B & B = Vertical Intercept

- β. & β. = Slope
 y = the true y-value
 g = the estimated y-value
- The smaller the 50m of given enor (554) is, the better the linear regression line fit is.
- Coefficient of Correlation (R)

Guide for Interpretation (Memorize)

O: No Relationship

O: No Relationship

O: 0.01-0.19: Very Weak

O: 0.20-0.39: Weak

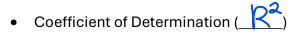
O: 0.40-0.59: Modurate

O: 0.60-0.79: Strong

O: 0.80-0.99: Very Streng

I: Perfect

- o The slope shares the same sign (+/-) with R



- o This number is always between ______ & ______
- An <u>influenta</u> is an observation that affects the regression equation when included versus when it is not
- Calculator Tricks
 - o Those included in formula sheet
 - LinRegTTest
 - o Those not included in formula sheet
 - Scatter Plots
 - Make your scatter plot

2nd > Y=> select a plot > Turn on - Specify lists > graph

• Zoom in to your plot

Zoom > 9: ZoomStat

LinReg(a+bx)

Stat > Calc > 8: Linkeg(a+bx) > Specify lists

- Formulas
 - Those included in formula sheet
 - Both models from above
 - Estimated Slope
 - Estimated Vertical Intercept
 - Coefficient of Correlation
 - Error
 - Those not included in formula sheet
 - Sum of Squares Error

Coefficient of Determination

Standardized Residual Plot Point

- Hypotheses and Interpretations
 - o Null states $\beta = 0$ & the alternative states $\beta \neq 0$
 - Coefficient of Correlation interpretation is a

description of the relationship

- · Example: Strong Positive Linear Relationship
- o Coefficient of Determination interpretation:

• (R2)% of variation in y can be explained by x.

- sufficient/insufficient statement
- Reading the graphs
 - We look at the ______ and not the ______ to see if there is an influential point
 - Can only tell if a trend is linear, non-linear, or has no relationship & whether it is positive or negative without more information (like R)