Linear Model

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Poisson Model

$$log(Y) = \beta_0 + \beta_1 X$$

Poisson Model

$$log(Y) = \beta_0 + \beta_1 X$$

$$\beta_1 x = log(Y(X = x)) - \beta_0$$

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$$exp(\beta_1) = \frac{Y(X=x+1)}{Y(X=x)}$$

Poisson Model

$$exp(\beta_1) = \frac{Y(X=x+1)}{Y(X=x)}$$

Poisson Model

$$exp(\beta_1) = \frac{Y(X{=}x{+}1)}{Y(X{=}x)}$$

$$exp(\beta_1) - 1 = \frac{Y(X{=}x{+}1)}{Y(X{=}x)} - 1 = \frac{Y(X{=}x{+}1)}{Y(X{=}x)} - \frac{Y(X{=}x)}{Y(X{=}x)}$$

Poisson Model

$$exp(\beta_1) = \frac{Y(X{=}x{+}1)}{Y(X{=}x)}$$

$$exp(\beta_1) - 1 = \frac{Y(X{=}x{+}1)}{Y(X{=}x)} - 1 = \frac{Y(X{=}x{+}1)}{Y(X{=}x)} - \frac{Y(X{=}x)}{Y(X{=}x)}$$

$$exp(\beta_1) - 1 = \frac{Y(X{=}x{+}1) - Y(X{=}x)}{Y(X{=}x)}$$

Poisson Model

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$$exp(\beta_1) - 1 = \frac{Y(X{=}x{+}1)}{Y(X{=}x)} - 1 = \frac{Y(X{=}x{+}1)}{Y(X{=}x)} - \frac{Y(X{=}x)}{Y(X{=}x)}$$

$$exp(\beta_1) - 1 = \frac{Y(X{=}x{+}1) - Y(X{=}x)}{Y(X{=}x)}$$

$$(exp(\beta_1) - 1) * 100 = \text{percent change in outcome}$$

Poisson Model

$exp(\beta_1) = \frac{Y(X=x+1)}{Y(X=x)}$

$exp(\beta_1) - 1 = \frac{Y(X=x+1)}{Y(X=x)} - 1 = \frac{Y(X=x+1)}{Y(X=x)} - \frac{Y(X=x)}{Y(X=x)}$

$exp(\beta_1) - 1 = \frac{Y(X=x+1) - Y(X=x)}{Y(X=x)}$

$(exp(\beta_1) - 1) * 100 =$ percent change in outcome

For increasingly small β_1 then $exp(\beta_1) - 1 \approx \beta_1$