# Xay dung mo hinh hoi quy tuyen tinh giua dan so Pakistan va ti le tang dan so hang nam

# tu nam 1980 den 2019 o khu vuc nong thon

# Du lieu nguon: WorldBank

data\_popular\_rural <- c(56147611, 57783345, 59554314, 61384677, 63251625, 65138833, 67043052, 68964166,

70891610, 72817260, 74733493, 76630022, 78510965, 80404597, 82349795, 84371245,

86480356, 88662973, 90904566, 93179311, 95395819, 97542768, 99630010, 101684618,

103741796, 105829500, 107953132, 110103932, 112275602, 114454984, 116631399,

118801037, 120968850, 123148456, 125349873, 127581406, 129844974, 132134976,

134404267, 136637556)

data\_rate\_rural <- c(2.759566164,2.871645184,3.018815114,3.027150724,2.996057523,2.940006545,

2.881409577,2.825205617,2.756505449,2.680092416,2.597534344,2.506057362,

2.424936449,2.38330546,2.390461608,2.425067725,2.469064538,2.492507147,

2.496786959,2.471548113,2.350903943,2.225617648,2.117249645,2.041261842,

2.002903844,1.992422725,1.986786144,1.972758611,1.953182472,1.922501206,

1.883693298,1.843161002,1.808293859,1.785751249,1.771822451,1.764582785,

1.758659187,1.748271444,1.70282305,1.647966737)

Call:

glm(formula = data\_popular\_rural ~ data\_rate\_rural)

Deviance Residuals:

Min 1Q Median 3Q Max

-13201563 -3848996 -379767 4446158 8120224

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 219869412 4835075 45.47 <2e-16 \*\*\*

data\_rate\_rural -54544892 2073299 -26.31 <2e-16 \*\*\*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for gaussian family taken to be 3.157518e+13)

Null deviance: 2.3054e+16 on 39 degrees of freedom

Residual deviance: 1.1999e+15 on 38 degrees of freedom

AIC: 1360.8

Number of Fisher Scoring iterations: 2

> ln\_data\_popular\_rural <- log(data\_popular\_rural)

> lm\_model2 <- lm(ln\_data\_popular\_rural ~ data\_rate\_rural)

> summary(lm\_model2)

Call:

lm(formula = ln\_data\_popular\_rural ~ data\_rate\_rural)

Residuals:

Min 1Q Median 3Q Max

-0.21160 -0.02184 0.00085 0.03423 0.12296

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 19.70282 0.05201 378.85 <2e-16 \*\*\*

data\_rate\_rural -0.59709 0.02230 -26.77 <2e-16 \*\*\*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.06044 on 38 degrees of freedom

Multiple R-squared: 0.9497, Adjusted R-squared: 0.9483

F-statistic: 716.9 on 1 and 38 DF, p-value: < 2.2e-16

> lm\_model3 <- lm(data\_popular\_rural ~ data\_rate\_rural)

> summary(lm\_model3)

Call:

lm(formula = data\_popular\_rural ~ data\_rate\_rural)

Residuals:

Min 1Q Median 3Q Max

-13201563 -3848996 -379767 4446158 8120224

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 219869412 4835075 45.47 <2e-16 \*\*\*

data\_rate\_rural -54544892 2073299 -26.31 <2e-16 \*\*\*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 5619000 on 38 degrees of freedom

Multiple R-squared: 0.948, Adjusted R-squared: 0.9466

F-statistic: 692.1 on 1 and 38 DF, p-value: < 2.2e-16

Theo 3 mô hình trên:

Mô hình 1 (GLM): 

Mô hình 2 (LM): 

Mô hình 3 (LM): 