

The Log TRANSFORMATION

Eg The table shows GDP (in \$) and expected lifespan (in years) for 12 countries.

GDP	36032	34484	26664	41590	26593	25592	1454	713	1073	1192	631	1302
Lifespan	80.4	79.8	79.2	77.4	78.8	81.5	74.9	72.0	77.9	70.3	73.0	68.6

The association is non-linear
Using a $\log x$ transformation

- Linearise the data and find the regression line.
- Predict the lifespan in a country with a GDP of \$20,000, correct to 1 decimal place.

Walk through on computer.

Solⁿ.

$$\begin{aligned} a) \quad y &= ax + b \\ a &= 5.5937 & b &= 54.275 \\ r &= 0.8935 & x &= \log \text{GDP} \end{aligned}$$

$$\text{Lifespan} = 5.594 \log(\text{GDP}) + 54.28$$

$$\begin{aligned} b) \quad \text{Lifespan} &= 5.594 \log(20000) + 54.28 \\ &= 78.3399 \\ &= 78.3 \text{ years.} \end{aligned}$$

Questions: Exercise 5 C on WorkPlan.