

9-20-05

①

How to compare models  
against each other: RMSR

Pop'n of Chile

Two Models

$$y = 5000 \cdot 1.02^t$$

$$y = 4922.9 \cdot 1.0196^t$$

$y$  = Pop. Chile (thousands)

$t$  = yrs since 1940.

(2)

t yr	POP	Predictions $5000 \cdot 1.02^t$	residuals -squared.
1912 → 0	5023	$5000 \cdot 1.02^0$ = 5000	$(5000 - 5023)^2 = (-23)^2 = 529$
12	5932	$5000 \cdot 1.02^{12}$ = 6349.2	$(6341.2 - 5932)^2 = 167,444$
20	7374	7429.7	
30	8885	9056.8	
42	11330		
52	13348		

---

t	POP	$4922.9 \cdot 1.0196^t$	$(\text{resid})^2$
0	5023	4922.9	$-(4922.9 - 5023)^2 =$
12	5932	$4922.9 \cdot 1.0196^{12}$ = 6214.1	
20	7374		
30	8885		
42	11330		
52	13348		

# Lab C

3

Which Model (linear or exponential) is better for Pop'n of South Africa?

Best Linear Model - Regression

Excel Plot Data Add Trendline  
Linear

Best Exponential Model

Excel Plot Data Add Trendline  
Exponential

Criteria Exp vs Lin

①  $R^2$  closer to 1 is better

② Shape of graph  
Curved vs linear

③ RMSR - ~~the~~ smaller  
is better

9-20-05

④

$$F5: = \exp(0.023)$$

$$D6: = \text{sqrt}(\text{average}(D10: D50))$$

End

$$C10: = D\$4 * A10 + D\$5$$

$$m \quad t \quad + \quad b$$

$$D10: = (C10 - B10)^2$$

residual pred - act.

$$E10: = F\$4 * F\$5 ^ A10$$

$$k \cdot a^t$$

$$F10: = (E10 - B10)^2$$