$Range\ Transformation$
$-Example$

$Example: Consider\ the\ following\ recurrence\ equation:$

$$t_n = t_{n-1}^4$$

$Solution: This\ is\ a\ non-linear\ form. Therefore,$
$applying\ transforming\ , we\ get\ the\ following:$

$logt_n = logt_{n-1}^4 = 4 \times logt_{n-1}$
$Let\ s(n) = logt_n$

$\therefore logt_n = 4 \times logt_{n-1}$

$\Longrightarrow s(n) = 4s_{n-1}$

$The\ solution\ for\ this\ problem\ is\ s_n = 4^n\ .Now\ , to$
$reconvert\ the\ result\ into\ the\ solution\ of\ the\ original$

problem, apply the reverse of logarithm , which is exponential:

$\therefore t_n = 2^{s(n)} = 2^{4n}$

Thus, combinations of domain and range transformations are always useful for solving recurrence equations.

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