May 22, 2018

$$C_k = \frac{k^k}{(k+1)^{k+1}} = \frac{1}{k}\left(\frac{k}{k+1}\right)^{k+1} \to 0, \ \ k \to \infty$$

, :

$$||x_{k+1} - x_*|| \le C_k||x_k - x_*||, \ C_k \to 0 \ \ k \to \infty$$

$$x_* = \lim_{k\to\infty} \frac{1}{k^k} = 0$$

$$\Rightarrow \frac{1}{(k+1)^{k+1}} \le C_k \frac{1}{k^k} = \frac{k^k}{(k+1)^{k+1}} \frac{1}{k^k} = \frac{1}{(k+1)^{k+1}}$$

$$\therefore \frac{1}{(k+1)^{k+1}} \le \frac{1}{(k+1)^{k+1}}$$