sigui s_n^m definit de la següent forma:

$s_n^n = 1 \quad \forall n \geq 0$

$s_{n+1}^n = a_n \quad \forall n \geq 0$

$s_n^m = a_{n-1} s_{n-1}^m + s_{n-2}^m \quad \forall n \geq m+2$ $\qquad$ s_n^m indefinit si $n<m$

notis que $s^0 = \alpha$ i $s^1 = \beta$

a més, $s_n^m = s_n^{m+1} a_m + s_n^{m+2} \quad \forall n \geq m+2$, es veu inductivament.

cas $n=m+2 \rightarrow s_{m+2}^m = a_{m+1} s_{m+1}^m + s_m^m = a_{m+1} a_m + 1 = s_{m+2}^{m+1} a_m + s_{m+2}^{m+2}$ ✓

cas $n=m+3 \rightarrow s_{m+3}^m = a_{m+2} s_{m+2}^m + s_{m+1}^m = a_{m+2}(a_{m+1}a_m + 1) + a_m = (a_{m+2}a_{m+1}+1)a_m + a_{m+2}$

$\qquad\qquad \| $

(totes les igualtats usen la definició de s) $\quad s_{m+3}^{m+1} a_m + s_{m+3}^{m+2}$ ✓

cas $n \geq m+3$

$\rightarrow s_n^m = a_{n-1} s_{n-1}^m + s_{n-2}^m \overset{\text{I.H.}}{=} a_{n-1}(s_{n-1}^{m+1} a_m + s_{n-1}^{m+2}) + s_{n-2}^{m+1} a_m + s_{n-2}^{m+2} =$

$= (a_{n-1} s_{n-1}^{m+1} + s_{n-2}^{m+1}) a_m + a_{n-1} s_{n-1}^{m+2} + s_{n-2}^{m+2} = s_n^{m+1} a_m + s_n^{m+2}$ ✓

si $p | s_n^m$ i $p | s_n^{m+1} \Rightarrow p \,|\, \underbrace{s_n^{m+1} a_m + s_n^{m+2}}_{p|s_n^m} - a_m \underbrace{s_n^{m+1}}_{p|s_n^{m+1}} = s_n^{m+2}$

iterant aquesta implicació, arribem a $p | s_n^{m+(n-m)}$ aka $p | s_n^n = 1$

$\Downarrow$

$p=1$

en concret, posant $m=0$, tenim $p|\alpha_n$ i $p|\beta_n \Rightarrow p=1$

aka α_n i β_n son coprimers