

Define $ctrb(a,b)=$ Func

Done

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Local $i,n,size,p$

$size:=dim(a)$

$n:=size[1]$

$i:=0$

$p:=b$

While $i < n-1$

$p:=augment(p,a^{i+1}.b)$

$i:=i+1$

EndWhile

Disp "P: ", p

Disp "Determinant:", $det(p)$

If $det(p)=0$ Then

Disp "Uncontrollable"

Else

Disp "Controllable"

EndIf

Return p

EndFunc

Define $obsv(a,c)=$ Func

Done

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Local $i,n,size,q$

$size:=dim(a)$

$n:=size[1]$

$i:=0$

$q:=c$

While $i < n-1$

$q:=\left(\text{augment}\left(q^T, \left(c \cdot a^{i+1}\right)^T\right)\right)^T$

$i:=i+1$

EndWhile

Disp "Q: ", q

Disp "Determinant:", $\det(q)$

If $\det(q)=0$ Then

Disp "Unobservable"

Else

Disp "Observable"

EndIf

Return q

EndFunc

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