

Esta ACTIVIDAD DE CLASE deberá realizarse descargando los documentos *NB* incompletos correspondientes a estos ejercicios de clase. Deberás seleccionar en el siguiente panel el enlace correspondiente al número que se te ha asignado en la cuenta del material personalizado de la actividad *m1-a1a*.

18-CP-C7-Mathematica-C

EJERCICIO 0

LECCION 9 - SOLUCION ECUACIONES

```
In[1]=
Off[General::"spell1"]
Off[General::"spell"]
```

01 - FACTORIZACION DE UNA SKYMATRIZ SIMETRICA

```
In[3]=
SymmSkyMatrixFactor[S_, tol_] := Module[{p, a, fail, i, j, k, l, m, n, ii, ij, jj, jk, jmj, d, s, row, v},
row = SymmSkyMatrixRowLengths[S]; s = Max[row]; {p, a} = S; n = Length[p] - 1; v = Table[0, {n}]; fail = 0;
Do[jj = p[[j + 1]]; If[jj < 0 | row[[j]] = 0, Continue[]]; d = a[[jj]]; jmj = Abs[p[[jj]]]; jk = jj - jmj;
Do[i = j - jk + k; v[[k]] = 0; ii = p[[i + 1]]; If[ii < 0, Continue[]]; m = Min[ii - Abs[p[[i]]], k] - 1;
ij = jmj + k; v[[k]] = a[[ij]]; v[[k]] -= Take[a, {ii - m, ii - 1}].Take[v, {k - m, k - 1}];
a[[ij]] = v[[k]] * a[[ii]], {k, 1, jk - 1}; d -= Take[a, {j mj + 1, j mj + jk - 1}].Take[v, {1, jk - 1}];
If[Abs[d] < tol * row[[j]], fail = j; a[[jj]] = Infinity; Break[]];
a[[jj]] = 1/d, {j, 1, n}; Return[{p, a}, fail];];
```

```
In[4]=
SymmSkyMatrixRowLengths[S_] := Module[{p, a, i, j, n, ii, jj, m, d, row}, {p, a} = S;
n = Length[p] - 1; row = Table[0, {n}]; Do[ii = p[[i + 1]]; If[ii < 0, Continue[]]; m = ii - i;
row[[i]] = a[[ii]]^2; Do[If[p[[j + 1]] > 0, d = a[[m + j]]^2; row[[i]] += d; row[[j]] += d],
{j, Max[1, Abs[p[[i]]] - m + 1], Min[n, i] - 1}], {i, 1, n}; Return[Sqrt[row]];];
```

02a - SOLUCION DEL SISTEMA DE ECUACIONES A PARTIR DE LA SKYMATRIZ FACTORIZADA Y DEL VECTOR DE TERMINOS INDEPENDIENTES

```
In[5]=
```

EJERCICIO 1

001 ALMACENAMIENTO TIPO SKYLINE - EJEMPLO CURSO 2004-5

MATRIZ DE RIGIDEZ

K =

11		13		16
	22	0	24	0
		33	34	0
			44	46
				55
				56
				66

symm

VECTOR SKYLINE

s = { 11, 22, 13, 0, 33, 24, 34, 44, 55, 16, 0, 0, 46, 56, 66 }

VECTOR LOCALIZACION TERMINOS DIAGONAL

p = { 0, 1, 2, 5, 8, 9, 15 }

VECTOR COMPLETO

S = { p, s }

S = { { 0, 1, 2, 5, 8, 9, 15 }, { 11, 22, 13, 0, 33, 24, 34, 44, 55, 16, 0, 0, 46, 56, 66 } }

001 MARCADO CONDICIONES CONTORNO EN DESPLAZAMIENTOS CURSO 2004-5

Equations for which the displacement component is known or prescribed are identified by a *negative* diagonal location value. For example, if u_3 and u_5 are prescribed displacement components in the sample system,

p : [0, 1, 2, -5, 8, -9, 15]

EJERCICIO 2

DATOS - EJERCICIO NUMEROS ENTEROS

■ -- INICIO

```
ClearAll[n];
```

■ 00a - GRADOS DE LIBERTAD

```
n = 20;
```

■ 00b - DATOS: MATRIZ DE RIGIDEZ - REPRESENTADA MEDIANTE VECTOR S

```
S = {{0, 1, 2, 5, 6, 7, 12, 18, 20, 22, 30, 39, 50, 51, 64, 74, 83, 87, 99, 104, 114},
{64, 87, 30, 35, 91, 70, 98, 42, 79, 91, 23, 6, 74, 58, 94, 43, 34, 84, 94, 8, 15, 56, 84,
63, 66, 15, 16, 50, 51, 17, 38, 18, 98, 10, 23, 50, 36, 42, 32, 88, 14, 46, 8, 51, 91, 2,
50, 71, 88, 68, 41, 99, 36, 90, 88, 47, 57, 17, 5, 15, 36, 36, 90, 78, 67, 58, 83, 36, 3,
92, 57, 92, 23, 62, 34, 42, 88, 39, 34, 83, 66, 73, 40, 70, 51, 43, 56, 83, 98, 66, 27,
73, 87, 26, 78, 30, 53, 13, 76, 44, 94, 67, 81, 11, 93, 52, 96, 98, 4, 9, 33, 33, 27, 72}};
```

■ 00c- DATOS: VECTOR DE FUERZAS NODALES CONSISTENTES

```
f = {33, 28, 30, 64, 3, 62, 57, 42, 99, 43, 14, 15, 42, 91, 61, 51, 30, 91, 70, 13};
```

01a- RECONSTRUCCION DE LA SKYMATRIZ ORIGINAL A PARTIR DEL VECTOR S

```
Ko = SymmSkyMatrixConvertToFull[S];
```

EJERCICIO 3

DATOS - EJERCICIO NUMEROS REALES

■ -- INICIO

```
ClearAll[n];
```

```
SetDirectory[NotebookDirectory[]]
```

```
C:\H0-Modulos-M30x_MeF-10\HM307-m6-a4a-sws\10-Solucion-ecuaciones\T-Solucion Ecuaciones - mathe - v2008
```

■ 00a - GRADOS DE LIBERTAD

```
n = 1000;
```

■ 00b - DATOS: MATRIZ DE RIGIDEZ - REPRESENTADA MEDIANTE VECTOR S

```
S << "S";
```

□ CALCULO DEL SEMIANCHO DE BANDA

```
MeanBand = N[p[[n + 1]] / n]
```

```
247.241
```

■ 00c- DATOS: VECTOR DE FUERZAS NODALES CONSISTENTES

```
f << "f";
```

```
Dimensions[f]
```

```
{1000}
```

01a- RECONSTRUCCION DE LA SKYMATRIZ ORIGINAL A PARTIR DEL VECTOR S

<p align="center">Universidad Politécnica Valencia (UPV) <i>Custom Material</i> ready to use in the CAE Recurdyn (v8R5) environment</p>									
#01	#02	#03	#04	#05	#06	#07	#08	#09	#10
#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
#21	#22	#23	#24	#25	#26	#27	#28	#29	#30
#31	#32	#33	#34	#35	#36	#37	#38	#39	#40
#41	#42	#43	#44	#45	#46	#47	#48	#49	#50
#51	#52	#53	#54	#55	#56	#57	#58	#59	#60
#61	#62	#63	#64	#65	#66	#67	#68	#69	#70
#71	#72	#73	#74	#75	#76	#77	#78	#79	#80
#81	#82	#83	#84	#85	#86	#87	#88	#89	#90
<p><i>Each student must download the one corresponding to the number assigned to them</i></p>									

Una vez completado, deberá subirse adecuadamente denominado a la cuenta de entrega personal, seleccionando del siguiente panel el enlace correspondiente al número que se te ha asignado en la cuenta del material personalizado de la actividad *m1-a1a*.

Universidad Politécnica Valencia (UPV)									
Links for delivery of the activity									
#01	#02	#03	#04	#05	#06	#07	#08	#09	#10
#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
#21	#22	#23	#24	#25	#26	#27	#28	#29	#30
#31	#32	#33	#34	#35	#36	#37	#38	#39	#40
#41	#42	#43	#44	#45	#46	#47	#48	#49	#50
#51	#52	#53	#54	#55	#56	#57	#58	#59	#60
#61	#62	#63	#64	#65	#66	#67	#68	#69	#70
#71	#72	#73	#74	#75	#76	#77	#78	#79	#80
#81	#82	#83	#84	#85	#86	#87	#88	#89	#90
<i>Each student must select the one that corresponds to the number assigned to them</i>									