Respuestas Examen Sustitutorio

Alex Steve Chung Alvarez

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1 Pregunta 1

1a. Las variables son:

x_1 : Cantidad de queso curado.
$2x_1$: Cantidad de queso semi-curado.
x_2 : Cantidad de queso tierno.

El sistema estaría dado por:

$$\begin{bmatrix} 32 & 9 \\ 3 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} 436 \\ 44 \end{bmatrix}$$

1b. Por Cholesky:

$$G = \begin{bmatrix} 5.6568542 & 0.0000000 \\ 0.5303301 & 0.8477912 \end{bmatrix}$$

$$Gt = \begin{bmatrix} 5.6568542 & 0.5303301 \\ 0.0000000 & 0.8477912 \end{bmatrix}$$

Solucion de $G * y = b$ es:

$$\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} 77.0746391 \\ 3.6860489 \end{bmatrix}$$

Solución de $Gt * x = y$ es:

$$\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} 13.2173913 \\ 4.3478261 \end{bmatrix}$$

1c. Por Householder:

$$Q = \begin{bmatrix} -0.9956342 & -0.0933407 \\ -0.0933407 & 0.9956342 \end{bmatrix}$$

$$R = \begin{bmatrix} -32.1403174 & -9.0540487 \\ 0.0000000 & 0.1555678 \end{bmatrix}$$

$$QR = \begin{bmatrix} 32.0000000 & 9.0000000 \\ 3.0000000 & 1.0000000 \end{bmatrix}$$

$$x = \begin{bmatrix} -410.0331362 \\ 3.1113570 \end{bmatrix}$$

$$Ax = \begin{bmatrix} -13093.0581459 \\ -1226.9880517 \end{bmatrix}$$

1d. La matriz debe ser simetrica definida.

2 Pregunta 2

2a. Sean:

x_1 : Edad del primer amigo
x_2 : Edad del segundo amigo.

Las funciones generadas son:

$$f_1(x_1, x_2) = x_1 * x_2 - 42 = 0$$
$$f_2(x_1, x_2) = (x_1 + 5) * (x_2 + 5) - 132 = 0$$

2b.Las matrices del sistema, su jacobiano y la inversa son:

$$F(x) = \begin{bmatrix} x_1 x_2 - 42 \\ (x_1 + 5)(x_2 + 5) - 132 \end{bmatrix}$$

$$JF(x) = \begin{bmatrix} x_2 & x_1 \\ x_2 + 5 & x_1 + 5 \end{bmatrix}$$

$$[JF(x)]^{-1} = \begin{bmatrix} -\frac{\frac{x_1}{5}+1}{x_1-x_2} & \frac{x_1}{5(x_1-x_2)} \\ \frac{\frac{x_2}{5}+1}{x_1-x_2} & -\frac{x_2}{5x_1-5x_2} \end{bmatrix}$$

La tabla del método de Newton es:

k	$x_1^{(k)}$	$x_2^{(k)}$	Error
0	3.0000000	4.0000000	–
1	15.0000000	−2.0000000	67.0820393249937
2	10.7647059	2.2352941	101.823376490863
3	8.6616633	4.3383367	25.3677616171008
4	7.6386575	5.3613425	6.25476700228541
5	7.1791071	5.8208929	1.48003228986285
6	7.0236188	5.9763812	0.298662833483156
7	7.0005327	5.9994673	0.0341909189051903
8	7.0000003	5.9999997	0.000753730555771047
9	7.0000000	6.0000000	$4.00859675654615e-7$

2c. La tabla por el método de Homotopía es:

k	x_1	x_2	Error
1	1.0000000	0.0000000	1.2661695320880684
2	2.2661695	-0.8523764	1.5979080352103694
3	1.4673102	0.7455316	1.4450468912763077
4	1.1381763	2.1905785	0.7838123127106049
5	1.9219886	2.7407310	1.3653787857043262
6	3.2873674	2.8128144	2.0841203366635774
7	2.6307956	4.8969347	1.4503861018283906
8	4.0811817	4.7674413	0.5949809167452562
9	4.6314083	5.3624222	1.0189609711752592
10	4.5453964	6.3813832	0.6465302250297595
11	5.1919267	6.4497565	0.40518746746427325
12	5.5971141	6.5597927	0.2128864449674719
13	5.8100006	6.6957724	0.12086411079268
14	5.9106865	6.8166365	0.08420241301617448
15	5.9581213	6.9008389	0.05022261745886336
16	5.9808503	6.9510615	0.02676556682248421
17	5.9916506	6.9778271	0.01295274860444362
18	5.9965903	6.9907798	0.005715443814683141
19	5.9987141	6.9964953	0.002295178574748924
20	5.9995576	6.9987905	0.0008340537177122798
21	5.9998628	6.9996245	0.0002718964647208111
22	5.9999622	6.9998964	$7.858769485924455e-05$
23	5.9999909	6.9999750	$1.9832403848951685e-05$
24	5.9999981	6.9999948	$4.281696107888422e-06$
25	5.9999997	6.9999991	$7.689841838853795e-07$
26	6.0000000	6.9999999	$1.103095028653911e-07$
27	6.0000000	7.0000000	$1.1850204373331508e-08$
28	6.0000000	7.0000000	$8.475735668866946e-10$
29	6.0000000	7.0000000	$3.028066686283637e-11$

2d. El valor adecuado de N es 27, ya que a partir de ese valor da el resultado con un error del orden de 1e-08
2e. Recomiendo el método de Newton, ya que se llega al valor en 9 iteraciones.

3 Pregunta 3

3a.

$$\begin{bmatrix} 0.6 & 0.1 & 0.1 \\ 0.1 & 0.8 & 0.2 \\ 0.3 & 0.1 & 0.7 \end{bmatrix} \begin{bmatrix} R_1^{(k)} \\ R_2^{(k)} \\ R_3^{(k)} \end{bmatrix} = \begin{bmatrix} R_1^{(k+1)} \\ R_2^{(k+1)} \\ R_3^{(k+1)} \end{bmatrix}$$

$$\begin{bmatrix} R_1^{(0)} \\ R_2^{(0)} \\ R_3^{(0)} \end{bmatrix} = \begin{bmatrix} 30.0000000 \\ 20.0000000 \\ 50.0000000 \end{bmatrix}$$

3b. Aplicando Leverrier, se resuelve de la siguiente manera:

$$B_1 = \begin{bmatrix} 0.6000000 & 0.1000000 & 0.1000000 \\ 0.1000000 & 0.8000000 & 0.2000000 \\ 0.3000000 & 0.1000000 & 0.7000000 \end{bmatrix}$$

$$b_1 = -2.1000000$$

$$B_2 = \begin{bmatrix} -0.8600000 & -0.0600000 & -0.0600000 \\ -0.0100000 & -1.0100000 & -0.1100000 \\ -0.2300000 & -0.0300000 & -0.9300000 \end{bmatrix}$$

$$b_2 = 1.4000000$$

$$B_3 = \begin{bmatrix} 0.3000000 & -0.0000000 & -0.0000000 \\ 0.0000000 & 0.3000000 & 0.0000000 \\ 0.0000000 & -0.0000000 & 0.3000000 \end{bmatrix}$$

$$b_3 = -0.3000000$$

Resolviendolo, el polinomio característico es:

$$\varphi(\lambda) = \lambda^3 - 2.1000000\lambda^2 + 1.4000000\lambda - 0.3000000$$

3c. Por el metodo de Potencia, la tabla es:

k	y_1	y_2	y_3	λ	x_1	x_2	x_3	Error
0	–	–	–	–	30.0000000	20.0000000	50.0000000	–
1	25.0000000	29.0000000	46.0000000	46.0000000	0.5434783	0.6304348	1.0000000	60.3644492
2	0.4891304	0.7586957	0.9260870	0.9260870	0.5281690	0.8192488	1.0000000	0.1894337
3	0.4988263	0.9082160	0.9403756	0.9403756	0.5304543	0.9658013	1.0000000	0.1465703
4	0.5148527	1.0256865	0.9557164	1.0256865	0.5019592	1.0000000	0.9317822	0.0814567
5	0.4943537	1.0365524	0.9028353	1.0365524	0.4769211	1.0000000	0.8709983	0.0657388
6	0.4732525	1.0218918	0.8527751	1.0218918	0.4631141	1.0000000	0.8345063	0.0390166
7	0.4613191	1.0132127	0.8230886	1.0132127	0.4553033	1.0000000	0.8123553	0.0234878
8	0.4544175	1.0080014	0.8052397	1.0080014	0.4508104	1.0000000	0.7988478	0.0142351
9	0.4503710	1.0048506	0.7944366	1.0048506	0.4481970	1.0000000	0.7906017	0.0086503
10	0.4479784	1.0029400	0.7878803	1.0029400	0.4466652	1.0000000	0.7855707	0.0052591
11	0.4465562	1.0017807	0.7838990	1.0017807	0.4457624	1.0000000	0.7825057	0.0031952
12	0.4457080	1.0010774	0.7814827	1.0010774	0.4452283	1.0000000	0.7806416	0.0019390
13	0.4452012	1.0006512	0.7800176	1.0006512	0.4449115	1.0000000	0.7795101	0.0011751
14	0.4448979	1.0003932	0.7791305	1.0003932	0.4447230	1.0000000	0.7788243	0.0007112
15	0.4447162	1.0002372	0.7785939	1.0002372	0.4446108	1.0000000	0.7784093	0.0004299
16	0.4446074	1.0001429	0.7782698	1.0001429	0.4445439	1.0000000	0.7781585	0.0002596
17	0.4445422	1.0000861	0.7780741	1.0000861	0.4445039	1.0000000	0.7780071	0.0001566
18	0.4445031	1.0000518	0.7779562	1.0000518	0.4444800	1.0000000	0.7779159	0.0000944
19	0.4444796	1.0000312	0.7778851	1.0000312	0.4444657	1.0000000	0.7778609	0.0000568
20	0.4444655	1.0000187	0.7778423	1.0000187	0.4444572	1.0000000	0.7778277	0.0000342
21	0.4444571	1.0000113	0.7778166	1.0000113	0.4444521	1.0000000	0.7778078	0.0000206
22	0.4444520	1.0000068	0.7778011	1.0000068	0.4444490	1.0000000	0.7777958	0.0000124
23	0.4444490	1.0000041	0.7777918	1.0000041	0.4444472	1.0000000	0.7777886	0.0000074
24	0.4444472	1.0000024	0.7777862	1.0000024	0.4444461	1.0000000	0.7777843	0.0000045
25	0.4444461	1.0000015	0.7777828	1.0000015	0.4444454	1.0000000	0.7777817	0.0000027
26	0.4444454	1.0000009	0.7777808	1.0000009	0.4444450	1.0000000	0.7777801	0.0000016
27	0.4444450	1.0000005	0.7777796	1.0000005	0.4444448	1.0000000	0.7777792	0.0000010
28	0.4444448	1.0000003	0.7777789	1.0000003	0.4444447	1.0000000	0.7777786	0.0000006
29	0.4444447	1.0000002	0.7777784	1.0000002	0.4444446	1.0000000	0.7777783	0.0000003
30	0.4444446	1.0000001	0.7777782	1.0000001	0.4444445	1.0000000	0.7777781	0.0000002
31	0.4444445	1.0000001	0.7777780	1.0000001	0.4444445	1.0000000	0.7777780	0.0000001
32	0.4444445	1.0000000	0.7777779	1.0000000	0.4444445	1.0000000	0.7777779	0.0000001
33	0.4444445	1.0000000	0.7777779	1.0000000	0.4444445	1.0000000	0.7777778	0.0000000
34	0.4444445	1.0000000	0.7777778	1.0000000	0.4444445	1.0000000	0.7777778	0.0000000
35	0.4444445	1.0000000	0.7777778	1.0000000	0.4444445	1.0000000	0.7777778	0.0000000
36	0.4444445	1.0000000	0.7777778	1.0000000	0.4444444	1.0000000	0.7777778	0.0000000

La solucion del valor y vector propios son $\lambda_1 = 1.0000000$ y $x_1 = \begin{bmatrix} 0.4444444 \\ 1.0000000 \\ 0.7777778 \end{bmatrix}$

Por el metodo de Potencia inversa, la tabla es:

k	y_1	y_2	y_3	λ	x_1	x_2	x_3	Error
0	–	–	–	–	30.0000000	20.0000000	50.0000000	–
1	40.0000000	6.6666667	53.3333333	53.3333333	0.7500000	0.1250000	1.0000000	60.4282891
2	1.1250000	-0.2291667	0.9791667	1.1250000	1.0000000	-0.2037037	0.8703704	0.4328394
3	1.6666667	-0.6172840	0.6172840	1.6666667	1.0000000	-0.3703704	0.3703704	0.5270463
4	1.8000000	-0.6506173	-0.1493827	1.8000000	1.0000000	-0.3614540	-0.0829904	0.4534484
5	1.8888889	-0.4727938	-0.8605396	1.8888889	1.0000000	-0.2503026	-0.4555798	0.3888155
6	1.9411765	-0.1916808	-1.4553780	1.9411765	1.0000000	-0.0987446	-0.7497402	0.3309081
7	1.9696970	0.1132034	-1.9313852	1.9696970	1.0000000	0.0574725	-0.9805494	0.2787054
8	1.9846154	0.4009157	-2.3086080	−2.3086080	-0.8596589	-0.1736612	1.0000000	2.7265968
9	-1.7126538	-0.5637710	2.2431046	2.2431046	-0.7635193	-0.2513351	1.0000000	0.1235963
10	-1.5240678	-0.6679517	2.1771650	2.1771650	-0.7000240	-0.3067988	1.0000000	0.0843082
11	-1.3986835	-0.7421710	2.1340316	2.1340316	-0.6554183	-0.3477788	1.0000000	0.0605725
12	-1.3101972	-0.7969319	2.1039319	2.1039319	-0.6227375	-0.3787821	1.0000000	0.0450471
13	-1.2451710	-0.8383255	2.0819769	2.0819769	-0.5980715	-0.4026584	1.0000000	0.0343291
14	-1.1959970	-0.8701869	2.0654540	2.0654540	-0.5790480	-0.4213054	1.0000000	0.0266384
15	-1.1580253	-0.8950621	2.0527340	2.0527340	-0.5641380	-0.4360341	1.0000000	0.0209581
16	-1.1282416	-0.9147064	2.0427759	2.0427759	-0.5523081	-0.4477762	1.0000000	0.0166681
17	-1.1045993	-0.9303655	2.0348805	2.0348805	-0.5428325	-0.4572089	1.0000000	0.0133702
18	-1.0856567	-0.9429438	2.0285592	2.0285592	-0.5351861	-0.4648343	1.0000000	0.0107988
19	-1.0703682	-0.9531117	2.0234595	2.0234595	-0.5289793	-0.4710308	1.0000000	0.0087705
20	-1.0579566	-0.9613740	2.0193206	2.0193206	-0.5239171	-0.4760879	1.0000000	0.0071554
21	-1.0478332	-0.9681170	2.0159452	2.0159452	-0.5197727	-0.4802298	1.0000000	0.0058594
22	-1.0395448	-0.9736397	2.0131820	2.0131820	-0.5163690	-0.4836322	1.0000000	0.0048126
23	-1.0327378	-0.9781762	2.0109128	2.0109128	-0.5135667	-0.4864339	1.0000000	0.0039627
24	-1.0271332	-0.9819119	2.0090445	2.0090445	-0.5112546	-0.4887457	1.0000000	0.0032696
25	-1.0225091	-0.9849943	2.0075031	2.0075031	-0.5093437	-0.4906564	1.0000000	0.0027023
26	-1.0186874	-0.9875419	2.0062292	2.0062292	-0.5077623	-0.4922378	1.0000000	0.0022365
27	-1.0155245	-0.9896504	2.0051748	2.0051748	-0.5064518	-0.4935482	1.0000000	0.0018532
28	-1.0129037	-0.9913976	2.0043012	2.0043012	-0.5053650	-0.4946350	1.0000000	0.0015370
29	-1.0107300	-0.9928467	2.0035767	2.0035767	-0.5044628	-0.4955372	1.0000000	0.0012758
30	-1.0089257	-0.9940496	2.0029752	2.0029752	-0.5037135	-0.4962865	1.0000000	0.0010597
31	-1.0074270	-0.9950487	2.0024757	2.0024757	-0.5030908	-0.4969092	1.0000000	0.0008807
32	-1.0061815	-0.9958790	2.0020605	2.0020605	-0.5025730	-0.4974270	1.0000000	0.0007322
33	-1.0051460	-0.9965694	2.0017153	2.0017153	-0.5021423	-0.4978577	1.0000000	0.0006091
34	-1.0042846	-0.9971436	2.0014282	2.0014282	-0.5017840	-0.4982160	1.0000000	0.0005068
35	-1.0035680	-0.9976213	2.0011893	2.0011893	-0.5014858	-0.4985142	1.0000000	0.0004217
36	-1.0029716	-0.9980190	2.0009905	2.0009905	-0.5012375	-0.4987625	1.0000000	0.0003511
37	-1.0024751	-0.9983500	2.0008250	2.0008250	-0.5010309	-0.4989691	1.0000000	0.0002923
38	-1.0020617	-0.9986255	2.0006872	2.0006872	-0.5008587	-0.4991413	1.0000000	0.0002434
39	-1.0017175	-0.9988550	2.0005725	2.0005725	-0.5007154	-0.4992846	1.0000000	0.0002027
40	-1.0014308	-0.9990461	2.0004769	2.0004769	-0.5005960	-0.4994040	1.0000000	0.0001688
41	-1.0011921	-0.9992053	2.0003974	2.0003974	-0.5004966	-0.4995034	1.0000000	0.0001406
42	-1.0009932	-0.9993379	2.0003311	2.0003311	-0.5004138	-0.4995862	1.0000000	0.0001171

43	-1.0008275	-0.9994483	2.0002758	2.0002758	-0.5003448	-0.4996552	1.0000000	0.0000976
44	-1.0006895	-0.9995403	2.0002298	2.0002298	-0.5002873	-0.4997127	1.0000000	0.0000813
45	-1.0005745	-0.9996170	2.0001915	2.0001915	-0.5002394	-0.4997606	1.0000000	0.0000677
46	-1.0004787	-0.9996808	2.0001596	2.0001596	-0.5001995	-0.4998005	1.0000000	0.0000564
47	-1.0003989	-0.9997341	2.0001330	2.0001330	-0.5001662	-0.4998338	1.0000000	0.0000470
48	-1.0003324	-0.9997784	2.0001108	2.0001108	-0.5001385	-0.4998615	1.0000000	0.0000392
49	-1.0002770	-0.9998153	2.0000923	2.0000923	-0.5001154	-0.4998846	1.0000000	0.0000327
50	-1.0002308	-0.9998461	2.0000769	2.0000769	-0.5000962	-0.4999038	1.0000000	0.0000272
51	-1.0001923	-0.9998718	2.0000641	2.0000641	-0.5000801	-0.4999199	1.0000000	0.0000227
52	-1.0001603	-0.9998932	2.0000534	2.0000534	-0.5000668	-0.4999332	1.0000000	0.0000189
53	-1.0001336	-0.9999110	2.0000445	2.0000445	-0.5000556	-0.4999444	1.0000000	0.0000157
54	-1.0001113	-0.9999258	2.0000371	2.0000371	-0.5000464	-0.4999536	1.0000000	0.0000131
55	-1.0000927	-0.9999382	2.0000309	2.0000309	-0.5000386	-0.4999614	1.0000000	0.0000109
56	-1.0000773	-0.9999485	2.0000258	2.0000258	-0.5000322	-0.4999678	1.0000000	0.0000091
57	-1.0000644	-0.9999571	2.0000215	2.0000215	-0.5000268	-0.4999732	1.0000000	0.0000076
58	-1.0000537	-0.9999642	2.0000179	2.0000179	-0.5000224	-0.4999776	1.0000000	0.0000063
59	-1.0000447	-0.9999702	2.0000149	2.0000149	-0.5000186	-0.4999814	1.0000000	0.0000053
60	-1.0000373	-0.9999752	2.0000124	2.0000124	-0.5000155	-0.4999845	1.0000000	0.0000044
61	-1.0000311	-0.9999793	2.0000104	2.0000104	-0.5000129	-0.4999871	1.0000000	0.0000037
62	-1.0000259	-0.9999827	2.0000086	2.0000086	-0.5000108	-0.4999892	1.0000000	0.0000031
63	-1.0000216	-0.9999856	2.0000072	2.0000072	-0.5000090	-0.4999910	1.0000000	0.0000025
64	-1.0000180	-0.9999880	2.0000060	2.0000060	-0.5000075	-0.4999925	1.0000000	0.0000021
65	-1.0000150	-0.9999900	2.0000050	2.0000050	-0.5000062	-0.4999938	1.0000000	0.0000018
66	-1.0000125	-0.9999917	2.0000042	2.0000042	-0.5000052	-0.4999948	1.0000000	0.0000015
67	-1.0000104	-0.9999931	2.0000035	2.0000035	-0.5000043	-0.4999957	1.0000000	0.0000012
68	-1.0000087	-0.9999942	2.0000029	2.0000029	-0.5000036	-0.4999964	1.0000000	0.0000010
69	-1.0000072	-0.9999952	2.0000024	2.0000024	-0.5000030	-0.4999970	1.0000000	0.0000009
70	-1.0000060	-0.9999960	2.0000020	2.0000020	-0.5000025	-0.4999975	1.0000000	0.0000007
71	-1.0000050	-0.9999967	2.0000017	2.0000017	-0.5000021	-0.4999979	1.0000000	0.0000006
72	-1.0000042	-0.9999972	2.0000014	2.0000014	-0.5000017	-0.4999983	1.0000000	0.0000005
73	-1.0000035	-0.9999977	2.0000012	2.0000012	-0.5000015	-0.4999985	1.0000000	0.0000004
74	-1.0000029	-0.9999981	2.0000010	2.0000010	-0.5000012	-0.4999988	1.0000000	0.0000003
75	-1.0000024	-0.9999984	2.0000008	2.0000008	-0.5000010	-0.4999990	1.0000000	0.0000003
76	-1.0000020	-0.9999987	2.0000007	2.0000007	-0.5000008	-0.4999992	1.0000000	0.0000002
77	-1.0000017	-0.9999989	2.0000006	2.0000006	-0.5000007	-0.4999993	1.0000000	0.0000002
78	-1.0000014	-0.9999991	2.0000005	2.0000005	-0.5000006	-0.4999994	1.0000000	0.0000002
79	-1.0000012	-0.9999992	2.0000004	2.0000004	-0.5000005	-0.4999995	1.0000000	0.0000001
80	-1.0000010	-0.9999994	2.0000003	2.0000003	-0.5000004	-0.4999996	1.0000000	0.0000001
81	-1.0000008	-0.9999995	2.0000003	2.0000003	-0.5000003	-0.4999997	1.0000000	0.0000001
82	-1.0000007	-0.9999995	2.0000002	2.0000002	-0.5000003	-0.4999997	1.0000000	0.0000001
83	-1.0000006	-0.9999996	2.0000002	2.0000002	-0.5000002	-0.4999998	1.0000000	0.0000001
84	-1.0000005	-0.9999997	2.0000002	2.0000002	-0.5000002	-0.4999998	1.0000000	0.0000001
85	-1.0000004	-0.9999997	2.0000001	2.0000001	-0.5000002	-0.4999998	1.0000000	0.0000000
86	-1.0000003	-0.9999998	2.0000001	2.0000001	-0.5000001	-0.4999999	1.0000000	0.0000000

87	-1.0000003	-0.9999998	2.0000001	2.0000001	-0.5000001	-0.4999999	1.0000000	0.0000000
88	-1.0000002	-0.9999998	2.0000001	2.0000001	-0.5000001	-0.4999999	1.0000000	0.0000000
89	-1.0000002	-0.9999999	2.0000001	2.0000001	-0.5000001	-0.4999999	1.0000000	0.0000000
90	-1.0000002	-0.9999999	2.0000001	2.0000001	-0.5000001	-0.4999999	1.0000000	0.0000000
91	-1.0000001	-0.9999999	2.0000000	2.0000000	-0.5000001	-0.4999999	1.0000000	0.0000000
92	-1.0000001	-0.9999999	2.0000000	2.0000000	-0.5000000	-0.5000000	1.0000000	0.0000000
93	-1.0000001	-0.9999999	2.0000000	2.0000000	-0.5000000	-0.5000000	1.0000000	0.0000000
94	-1.0000001	-0.9999999	2.0000000	2.0000000	-0.5000000	-0.5000000	1.0000000	0.0000000

La solucion del valor y vector propios son $\lambda_2 = 0.5000000$ y $x_2 = \begin{bmatrix} -0.5000000 \\ -0.5000000 \\ 1.0000000 \end{bmatrix}$ Por el metodo de Potencia inversa desplazado, la tabla es:

k	y_1	y_2	y_3	λ	x_1	x_2	x_3	Error
0	–	–	–	–	30.0000000	20.0000000	50.0000000	–
1	141.6666667	-672537544353993856.0000000	672537544353994112.0000000	672537544353994112.0000000	0.0000000	-1.0000000	1.0000000	61.1718890
2	5.0000000	-19215358410114112.0000000	19215358410114108.0000000	−19215358410114112.0000000	-0.0000000	1.0000000	-1.0000000	2.8284271
3	-5.0000000	19215358410114112.0000000	-19215358410114112.0000000	19215358410114112.0000000	-0.0000000	1.0000000	-1.0000000	0.0000000

La solucion del valor y vector propios son $\lambda_3 = 0.6000000$ y $x_3 = \begin{bmatrix} 0.0000000 \\ 1.0000000 \\ -1.0000000 \end{bmatrix}$

3d. La distribución es estable, debido a que $\lambda_1 = 1$

4 Pregunta 4

4a. Polinomio de Newton

$$P(t) = -1.545t + 0.279453333333334\,(t - 2.0)\,(t - 1.5)\,(t - 1.0)\,(t - 0.5) - 0.57492\,(t - 1.5)\,(t - 1.0)\,(t - 0.5) + 1.31746\,(t - 1.0)\,(t - 0.5) + 2.545$$

4b.

$$P(0.7) = 1.38493361874731$$

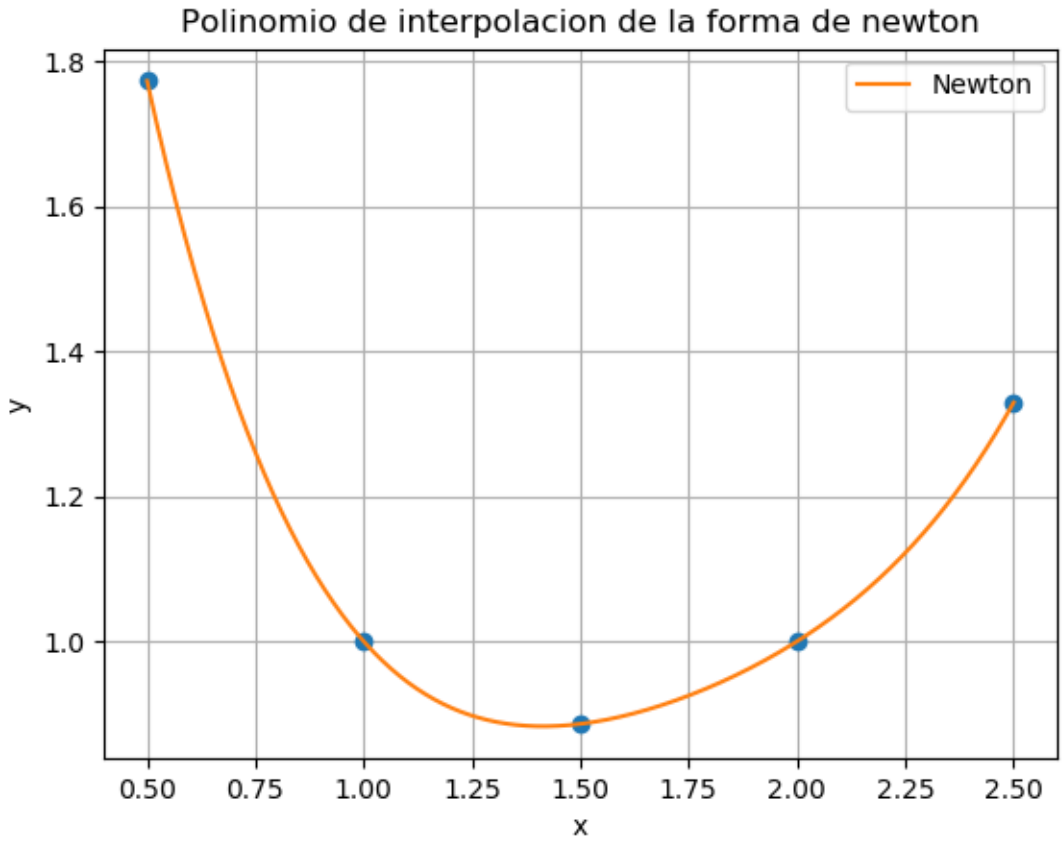
4c.

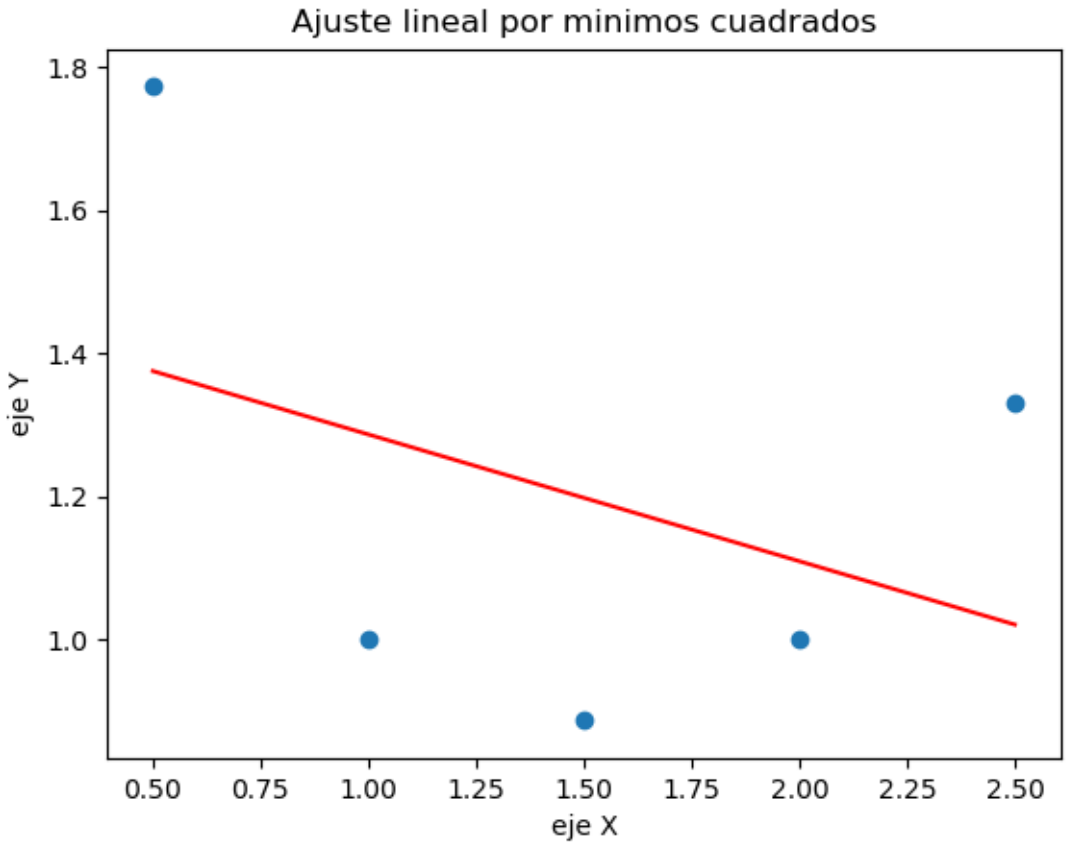
$$P(x) = -0.1772800000000001x + 1.4635259999999999$$

4d.

$$P(0.7) = 1.33943$$

4e.


Polinomio de interpolacion de la forma de newton
Newton
1.8
1.6
1.4
1.2
1.0
y
0.50
0.75
1.00
1.25
1.50
1.75
2.00
2.25
2.50
x



minimos cuadrados: