Entrega 2

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1   Tests

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Busquedas Incrementales
Hay una raiz de f en [-2.5,-2]
Hay una raiz de f en [-1,-0.5]
Hay una raiz de f en [0.5,1]
Hay una raiz de f en [2,2.5]
Hay una raiz de f en [4,4.5]
Hay una raiz de f en [5,5.5]
Hay una raiz de f en [7,7.5]
Hay una raiz de f en [8,8.5]
Hay una raiz de f en [10,10.5]
Hay una raiz de f en [11.5,12]
Hay una raiz de f en [13.5,14]
Hay una raiz de f en [14.5,15]
Hay una raiz de f en [16.5,17]
Hay una raiz de f en [17.5,18]
Hay una raiz de f en [19.5,20]
Hay una raiz de f en [21,21.5]
Hay una raiz de f en [22.5,23]
Hay una raiz de f en [24,24.5]
Hay una raiz de f en [26,26.5]
Hay una raiz de f en [27,27.5]
Hay una raiz de f en [29,29.5]
Hay una raiz de f en [30,30.5]
Hay una raiz de f en [32,32.5]
Hay una raiz de f en [33.5,34]
Hay una raiz de f en [35,35.5]
Hay una raiz de f en [36.5,37]
Hay una raiz de f en [38.5,39]
Hay una raiz de f en [39.5,40]
Hay una raiz de f en [41.5,42]
Hay una raiz de f en [43,43.5]
Hay una raiz de f en [44.5,45]
Hay una raiz de f en [46,46.5]
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Biseccion
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i	a	xm	b	f(x)	E
1	0.0000000000	0.5000000000	1.0000000000	−0.293109	1
2	0.5000000000	0.7500000000	1.0000000000	−0.118396	0.25
3	0.7500000000	0.8750000000	1.0000000000	−0.0368177	0.125
4	0.8750000000	0.9375000000	1.0000000000	0.000633916	0.0625
5	0.8750000000	0.9062500000	0.9375000000	−0.0177723	0.03125
6	0.9062500000	0.9218750000	0.9375000000	−0.00848658	0.015625
7	0.9218750000	0.9296875000	0.9375000000	−0.00390536	0.0078125
8	0.9296875000	0.9335937500	0.9375000000	−0.00163044	0.00390625
9	0.9335937500	0.9355468750	0.9375000000	−0.000496935	0.001953125
10	0.9355468750	0.9365234375	0.9375000000	0.0000688224	0.0009765625
11	0.9355468750	0.9360351563	0.9365234375	−0.000213974	0.00048828125
12	0.9360351563	0.9362792969	0.9365234375	−0.0000725548	0.000244140625

13	0.9362792969	0.9364013672	0.9365234375	−0.0000186098	0.0001220703125
14	0.9364013672	0.9364624023	0.9365234375	0.0000334820	0.00006103515625
15	0.9364013672	0.9364318848	0.9364624023	0.0000158108	0.000030517578125
16	0.9364013672	0.9364166260	0.9364318848	0.00000697501	0.0000152587890625
17	0.9364013672	0.9364089966	0.9364166260	0.00000255703	0.00000762939453125
18	0.9364013672	0.9364051819	0.9364089966	3.48029e−7	0.000003814697265625
19	0.9364013672	0.9364032745	0.9364051819	−7.56477e−7	0.0000019073486328125
20	0.9364032745	0.9364042282	0.9364051819	−2.04223e−7	9.5367431640625e−7
21	0.9364042282	0.9364047050	0.9364051819	7.19031e−8	4.76837158203125e−7
22	0.9364042282	0.9364044666	0.9364047050	−6.61601e−8	2.384185791015625e−7
23	0.9364044666	0.9364045858	0.9364047050	2.87151e−9	1.1920928955078125e−7
24	0.9364044666	0.9364045262	0.9364045858	−3.16443e−8	5.960464477539063e−8

Regla Falsa

i	a	xm	b	f(x)	E
1	0.0000000000	0.9339403807	1.0000000000	−0.00142908	1
2	0.9339403807	0.9365060517	1.0000000000	0.0000587560	0.0025656709474096706
3	0.9339403807	0.9364047307	0.9365060517	8.67825e−8	0.0001013209229840939
4	0.9339403807	0.9364045811	0.9364047307	1.28154e−10	1.4964177252885236e−7
5	0.9339403807	0.9364045809	0.9364045811	1.89182e−13	2.2097967899981086e−10

Punto Fijo

i	xi	g(xi)	f(xi)	E
0	−0.5000000000000000	−0.2931087267313766	0.206891	1.00000
1	−0.2931087267313766	−0.41982154360625734	−0.126713	0.206891
2	−0.41982154360625734	−0.3463045191776651	0.0735170	0.126713
3	−0.3463045191776651	−0.3909584565423095	−0.0446539	0.0735170
4	−0.3909584565423095	−0.3644050348941392	0.0265534	0.0446539
5	−0.3644050348941392	−0.3804263031679563	−0.0160213	0.0265534
6	−0.3804263031679563	−0.37083679528020885	0.00958951	0.0160213
7	−0.37083679528020885	−0.3766056453635812	−0.00576885	0.00958951
8	−0.3766056453635812	−0.373145417607189	0.00346023	0.00576885
9	−0.373145417607189	−0.3752246411870562	−0.00207922	0.00346023
10	−0.3752246411870562	−0.37397658604830963	0.00124806	0.00207922
11	−0.37397658604830963	−0.3747262157084321	−0.000749630	0.00124806
12	−0.3747262157084321	−0.3742761333104539	0.000450082	0.000749630
13	−0.3742761333104539	−0.3745464284580923	−0.000270295	0.000450082
14	−0.3745464284580923	−0.3743841264348447	0.000162302	0.000270295
15	−0.3743841264348447	−0.3744815908319551	−0.0000974644	0.000162302
16	−0.3744815908319551	−0.37442306518389706	0.0000585256	0.0000974644
17	−0.37442306518389706	−0.37445820986270584	−0.0000351447	0.0000585256
18	−0.37445820986270584	−0.3744371058494556	0.0000211040	0.0000351447
19	−0.3744371058494556	−0.37444977872741303	−0.0000126729	0.0000211040
20	−0.37444977872741303	−0.37444216876320036	0.00000760996	0.0000126729
21	−0.37444216876320036	−0.3744467385052047	−0.00000456974	0.00000760996
22	−0.3744467385052047	−0.37444399440652526	0.00000274410	0.00000456974
23	−0.37444399440652526	−0.37444564222126353	−0.00000164781	0.00000274410
24	−0.37444564222126353	−0.37444465271927385	9.89502e−7	0.00000164781
25	−0.37444465271927385	−0.3744452469090602	−5.94190e−7	9.89502e−7
26	−0.3744452469090602	−0.37444489010190096	3.56807e−7	5.94190e−7
27	−0.37444489010190096	−0.37444510436235334	−2.14260e−7	3.56807e−7
28	−0.37444510436235334	−0.3744449757003151	1.28662e−7	2.14260e−7
29	−0.3744449757003151	−0.37444505296105535	−7.72607e−8	1.28662e−7
30	−0.37444505296105535	−0.3744450065664714	4.63946e−8	7.72607e−8

Newton

iter	xi	f(x)	E
0	0.5000000000000000	−0.2931087267313766	1.0000000000000000
1	0.9283919899125719	−0.004662157097372055	0.428919899125719
2	0.9363667412673313	−0.000021912619882713535	0.007974751354759446
3	0.9364045800189902	−4.98339092214195e−10	0.00003783875165885853
4	0.9364045808795621	−1.1102230246251565e−16	8.605719470367035e−10

Secante

iter	xi	f(x)	E
0	0.5000000000000000	0.0000000000000000	1.0000000000000000
1	1.0000000000000000	0.03536607938024017	1.0000000000000000
2	0.946166222306525	0.005619392737863826	0.05383377769347497
3	0.9359965807911726	−0.0002363221747059835	0.010169641515352379
4	0.9364070023767039	0.0000014022358910681376	0.00041042158553128427
5	0.9364045814731196	3.4371649970665885e−10	0.000002420903584376655
6	0.9364045808795615	−4.996003610813204e−16	5.935580915661376e−10

Raices Multiples

i	xi	f(x)	E
0	1.000000000000000000	0.7182818284590451	1.0000000000000000
1	−0.23421061355351425	0.025405775475345838	1.2342106135535142
2	−0.0084582799076109	0.00003567060801401567	0.22575233364275316
3	−0.000011890183808588653	7.068789997788372e−11	0.008446389726952502
4	−4.218590698935789e−11	0	0.000011890141622681664
5	−4.218590698935789e−11	0	0

Simple Gaussian Reduction
Results:

Step 0

    2.000000E+00   −1.000000E+00   0.000000E+00   3.000000E+00   1.000000E+00
    1.000000E+00   5.000000E−01   3.000000E+00   8.000000E+00   1.000000E+00
    0.000000E+00   1.300000E+01   −2.000000E+00   1.100000E+01   1.000000E+00
    1.400000E+01   5.000000E+00   −2.000000E+00   3.000000E+00   1.000000E+00

Step 1

    2.000000E+00   −1.000000E+00   0.000000E+00   3.000000E+00   1.000000E+00
    0.000000E+00   1.000000E+00   3.000000E+00   6.500000E+00   5.000000E−01
    0.000000E+00   1.300000E+01   −2.000000E+00   1.100000E+01   1.000000E+00
    0.000000E+00   1.200000E+01   −2.000000E+00   −1.800000E+01   −6.000000E+00

Step 2

    2.000000E+00   −1.000000E+00   0.000000E+00   3.000000E+00   1.000000E+00
    0.000000E+00   1.000000E+00   3.000000E+00   6.500000E+00   5.000000E−01
    0.000000E+00   0.000000E+00   −4.100000E+01   −7.350000E+01   −5.500000E+00
    0.000000E+00   0.000000E+00   −3.800000E+01   −9.600000E+01   −1.200000E+01

Step 3

    2.000000E+00   −1.000000E+00   0.000000E+00   3.000000E+00   1.000000E+00
    0.000000E+00   1.000000E+00   3.000000E+00   6.500000E+00   5.000000E−01
    0.000000E+00   0.000000E+00   −4.100000E+01   −7.350000E+01   −5.500000E+00
    0.000000E+00   0.000000E+00   0.000000E+00   −2.787805E+01   −6.902439E+00

After Back Sustitution

x:
    3.849519E−02
   −1.802275E−01
   −3.097113E−01
    2.475941E−01

Gaussian Reduction With Partial Pivoting
Results:

Step 0

    2.000000E+00   −1.000000E+00   0.000000E+00   3.000000E+00   1.000000E+00
    1.000000E+00   5.000000E−01   3.000000E+00   8.000000E+00   1.000000E+00
    0.000000E+00   1.300000E+01   −2.000000E+00   1.100000E+01   1.000000E+00
    1.400000E+01   5.000000E+00   −2.000000E+00   3.000000E+00   1.000000E+00

Step 1

    1.400000E+01   5.000000E+00   −2.000000E+00   3.000000E+00   1.000000E+00
    0.000000E+00   1.428571E−01   3.142857E+00   7.785714E+00   9.285714E−01
    0.000000E+00   1.300000E+01   −2.000000E+00   1.100000E+01   1.000000E+00
    0.000000E+00   −1.714286E+00   2.857143E−01   2.571429E+00   8.571429E−01

Step 2

    1.400000E+01   5.000000E+00   −2.000000E+00   3.000000E+00   1.000000E+00
    0.000000E+00   1.300000E+01   −2.000000E+00   1.100000E+01   1.000000E+00
    0.000000E+00   0.000000E+00   3.164835E+00   7.664835E+00   9.175824E−01
    0.000000E+00   2.220446E−16   2.197802E−02   4.021978E+00   9.890110E−01

Step 3

    1.400000E+01   5.000000E+00   −2.000000E+00   3.000000E+00   1.000000E+00
    0.000000E+00   1.300000E+01   −2.000000E+00   1.100000E+01   1.000000E+00

```
    0.000000E+00    0.000000E+00    3.164835E+00    7.664835E+00    9.175824E−01
    0.000000E+00    2.220446E−16    0.000000E+00    3.968750E+00    9.826389E−01
```

After Back Sustitution

x :
```
    3.849519E−02
   −1.802275E−01
   −3.097113E−01
    2.475941E−01
```

Gaussian Reduction With Total Pivoting
Results :

Step 0
```
    2.000000E+00   −1.000000E+00    0.000000E+00    3.000000E+00    1.000000E+00
    1.000000E+00    5.000000E−01    3.000000E+00    8.000000E+00    1.000000E+00
    0.000000E+00    1.300000E+01   −2.000000E+00    1.100000E+01    1.000000E+00
    1.400000E+01    5.000000E+00   −2.000000E+00    3.000000E+00    1.000000E+00
```

Step 1
```
    1.300000E+01    0.000000E+00   −2.000000E+00    1.100000E+01    1.000000E+00
    0.000000E+00    1.000000E+00    3.076923E+00    7.576923E+00    9.615385E−01
    0.000000E+00    2.000000E+00   −1.538462E−01    3.846154E+00    1.076923E+00
    0.000000E+00    1.400000E+01   −1.230769E+00   −1.230769E+00    6.153846E−01
```

Step 2
```
    1.300000E+01    1.100000E+01   −2.000000E+00    0.000000E+00    1.000000E+00
    0.000000E+00    7.576923E+00    3.076923E+00    1.000000E+00    9.615385E−01
    0.000000E+00   −4.440892E−16   −1.715736E+00    1.492386E+00    5.888325E−01
    0.000000E+00    0.000000E+00   −7.309645E−01    1.416244E+01    7.715736E−01
```

Step 3
```
    1.300000E+01    1.100000E+01    0.000000E+00   −2.000000E+00    1.000000E+00
    0.000000E+00    7.576923E+00    1.000000E+00    3.076923E+00    9.615385E−01
    0.000000E+00   −4.440892E−16    1.416244E+01   −7.309645E−01    7.715736E−01
    0.000000E+00    0.000000E+00    0.000000E+00   −1.638710E+00    5.075269E−01
```

After Back Sustitution

x :
```
    3.849519E−02
   −1.802275E−01
   −3.097113E−01
    2.475941E−01
```