Problema 1

step-size-exacto [[3],[5],[7]]



step-size-exacto [[-1],[2],[-3]]



[6.36691810e-11]]

step-size-constante 0.001 [[3],[5],[7]]



• step-size-constante 0.001 [[-1],[2],[-3]]

999.00 [[-0.60365901] [-0.4859957] [[0.27867768] [0.50599701] 0.63 [-0.8743294]] [-0.26266309]]

step-size-constante 0.01 [[3],[5],[7]]

999.00 [[-0.9855318] [-0.97953886] [[0.00847527] [0.01198586] 0.02 [-0.98553179]] [0.00847529]]

• step-size-constante 0.01 [[-1],[2],[-3]]

999.00 [[-0.99841608] [-0.99776] [[0.00092784] [0.00131216] [0.00092783]] 0.00 [-0.99841608]]

step-size-constante 0.1 [[3],[5],[7]]

373.00 [[-1.] [-1.] [-1.]] [[4.99540298e-10] [7.06456449e-10] 0.00 [4.99540298e-10]]

step-size-constante 0.1 [[-1],[2],[-3]]

337.00 [[-1.] [-1.] [-1.]] [[4.80465889e-10] [6.79481360e-10] 0.00 [4.80465889e-10]]

• step-size-constante 0.5 [[3],[5],[7]]

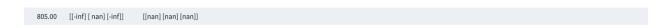


• step-size-constante 0.1 [[-1],[2],[-3]]

67.00 [[-1.] [-1.] [-1.]] [[4.65661287e-10] [-5.82076609e-10] [0.00 4.65661287e-10]]

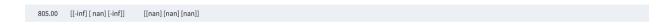
• step-size-constante 1 [[3],[5],[7]]

No converge



• step-size-constante 1 [[-1],[2],[-3]]

No converge



• step-size-variable



	1986.00	[[-0.9836776][-0.97691665] [-0.9836776]]	[[0.00956144] [0.01352192] [0.00956144]]
	1987.00	[[-0.98367952] [-0.97691936] [-0.98367952]]	[[0.00956032] [0.01352033] [0.00956032]]
	1988.00	[[-0.98368144] [-0.97692207] [-0.98368144]]	[[0.00955919] [0.01351874] [0.00955919]]
	1989.00	[[-0.98368335] [-0.97692478] [-0.98368335]]	[[0.00955807] [0.01351715] [0.00955807]]
**	1990.00	[[-0.98368527] [-0.97692749] [-0.98368527]]	[[0.00955695] [0.01351557] [0.00955695]]
	1991.00	[[-0.98368718] [-0.97693019] [-0.98368718]]	[[0.00955583] [0.01351398] [0.00955583]]
	1992.00	[[-0.9836891] [-0.9769329] [-0.9836891]]	[[0.00955471] [0.01351239] [0.00955471]]
	1993.00	[[-0.98369101] [-0.97693561] [-0.98369101]]	[[0.00955358] [0.01351081] [0.00955358]]
	1994.00	[[-0.98369292] [-0.97693831] [-0.98369292]]	[[0.00955246] [0.01350922] [0.00955246]]
	1995.00	[[-0.98369484] [-0.97694102] [-0.98369484]]	[[0.00955134] [0.01350764] [0.00955134]]
	1996.00	[[-0.98369675] [-0.97694372] [-0.98369675]]	[[0.00955022] [0.01350606] [0.00955022]]
	1997.00	[[-0.98369866] [-0.97694642] [-0.98369866]]	[[0.0095491][0.01350447] [0.0095491]]
	1998.00	[[-0.98370057] [-0.97694913] [-0.98370057]]	[[0.00954798] [0.01350289] [0.00954798]]
	1999.00	[[-0.98370248] [-0.97695183] [-0.98370248]]	[[0.00954687] [0.01350131] [0.00954687]]

Preguntas

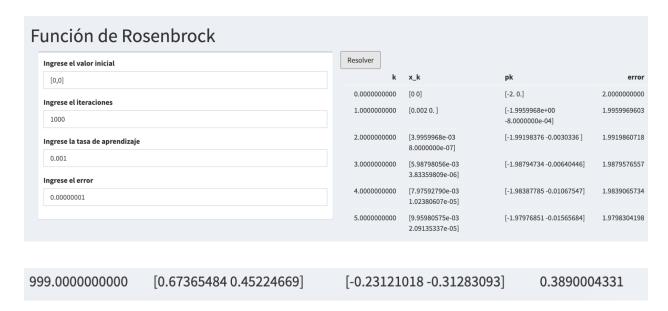
¿Qué observa?

Con $x_0 = [3, 5, 7]^T$ converge más lento que con $x_0 = [-1, 2, -3]^T$ dado que los valores vecinos están más cercanos a $min \ f(x) = [-1, -1, -1]$, con una mejor tasa de convergencia exacta.

¿Con cuál elección de $\alpha_{_{k}}$ ¿Se obtiene el mejor comportamiento?

El α_k con mejor comportamiento es el **exacto**, es seguido de **0.5**, convergiendo antes de las 100 iteraciones

Problema 2



Preguntas

¿Cómo se comporta el algoritmo?

Con los valores iniciales no termina de converger

¿Afecta la elección del punto inicial x0 el comportamiento del algoritmo?

Si afecta con valores del punto inicial x_0

¿Qué característica particular tiene esta función?

Es una función que con el x_0 incorrecto o un tasa de aprendizaje incorrecta el algoritmo se pude i al infinito muy rapidamente.

38.0000000000	[3.37470635e+19 8.28859006e+12]	[1.53733302e+61 -2.27772859e+41]	15373330227545505898124951885792156932888147795485148468740096.0000000000
39.0000000000	[-1.53733302e+59 2.27772859e+39]	[-1.45332873e+180 -4.72678565e+120]	Inf
40.0000000000	[1.45332873e+178 4.72678565e+118]	[inf-inf]	Inf
41.0000000000	[-inf inf]	[-inf inf]	Inf

Finalmente, efectúa más experimentos pero ahora cambiando únicamente el step-size αk , ¿qué sucede con el algoritmo para las distintas elecciones de αk ?

Al cambiar la tasa de aprendizaje a valores mayores el algoritmo se va al infinito y hace que no converja