

Computational Optimization

Table A - Compare Newton's Method and Quasi-Newton's method

Use tolerance 1e-6, max iterations 200.

1. $f_1(x) = x_1^2 + x_2^2 + x_3^2$, $x_0 = (1, 1, 1)^T$
2. $f_2(x) = x_1^2 + 2x_2^2 - 2x_1x_2 - 2x_2$, $x_0 = (0, 0)^T$
3. $f_3(x) = 100(x_2 - x_1^2)^2 + (1 - x_1)^2$, $x_0 = (-1.2, 1)^T$
4. $f_4()$ Skip this one
5. $f_5(x) = (x_1 - 1)^2 + (x_2 - 1)^2 + c(x_1^2 + x_2^2 - 0.25)^2$, $x_0 = (1, -1)^T$ with $c = 1$, and $c = 100$.

If an acceptable minimum solution is found (i.e. gradient is near 0), put a yes in the Min? column. Otherwise put a no. Be sure to discuss why the algorithm didn't work if you indicate no.

Function	Min?	method	f(x)	Iterations	time	$\ \nabla f(x)\ $
f1		NM				
		BFGS				
f2		NM				
		BFGS				
f3		NM				
		BFGS				
f4	xx	SKIP	xx	xx	xx	
f5a c=1		NM				
		BFGS				
f5 c=100		NM				
		BFGS				