Method for coding finite difference derivatives

MATLAB

```
[f,g] = coolobjfn(x, params)
    n = length(x)
    f = ((compute objective value here))
    if nargout > 1
        e = sqrt(eps)
        g = zeros(n,1)
        for k = 1:n
            y = x
            y(k) = y(k)+x
            fe = coolobjfn(y, params)
            g(k) = (fe-f)/e
        end
    end
return
```

PYTHON

```
def coolobjfn(x, params, gflag)
    n = len(x)
    f = (( compute objective value here ))
    if gflag:
        e = np.sqrt(np.finfo(np.float64).eps)
        df = np.zeros((n,1))
        for k in range(n)
            y = x.copy()
            y[k] += e
            df[k] = coolobjfn(y, params, False)
        g = (df-f)/e
        return f,g
    else:
        return f
```