```
# ShowSqrtWhile.py
"""
Checks out an implementation of a sqrt
function
implementation that is based on a
while loop.
"""

# You can rename an imported
function like this...
from math import sqrt as TrueSqrt

def sqrt(x):
   """

The square root of x and the number of iterations required.
   Example:     (y,iterations) =
sqrt(10)

   Precondition: x is a positive float or int
   """
   L=float(x)

  W=1.0
   relErr = 10e-15
   its=0
   itMax = 200
   while abs(L-W)/L > relErr and
its<=itMax:
      L = (L+W)/2
      W = x/L
      its+=1
   # How a function can return
"more than one thing...
   return (L,its)

# Test Script
if __name__=='__main__':

print '\n\n     x               sqrt(x)        relError    iterations'
    print
'-----------------------------------------------------------------'
    k = -17
    while
k<15:
       k+=2
       x = 10.0**k
       # How to process a function that can return more
than one thing...
       (y,iterations) = sqrt(x)
       # TrueSqrt is "really"
math.sqrt...
       yExact = TrueSqrt(x)
       relErr = abs(y - yExact)/yExact
       print
'%8.1e   %20.12e    %8.3e        %3d' % (x,y,relErr,iterations)
```