```python
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# In this project we'll only be considering population data.

# Brief programs for determining summary statistics of inputted data are written

#--------------------------------------------------------------------

L = [] # Empty list for data

v = 1 # initialize a variable


print("you'll be prompted to enter nonnegative integers. \n")

print('when you want to stop enter the word stop.')


while v == 1:

    try:

        l = int(input('Enter a nonnegative integer.'))

        L.append(l)

    except ValueError:

        print('input halted.')

        print('\n')

        v = 0


print('you inputted the numbers listed', L)

print('\n')

#-----------------------------------------------------


# below is the calculation of the mean.

s = sum(L) # The sum of the inputed numbers.
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N = len(L) # The number of the numbers entered.

mean = s/N # The arithmetic average

print('The mean of the numbers is', mean , '.')


#-------------------------------------------------------


# Below is the calculation of the median.
# The numbers need to be sorted.
L.sort()
# Further it is relevant whether there is an odd number of numbers or an even numbers
if N % 2 == 0: # The even case

    m1 = N/2
    m2 = (N/2) + 1 # The two middle positions


    m1 = int(m1)
    m2 = int(m2) # Casting as integers


    m1 = m1 - 1
    m2 = m2 - 1 # Correct one off error


    median = (L[m1] + L[m2])/2


else: # the odd case


    m = (N + 1)/2
    m = int(m) - 1
    median  = L[m]
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print('The median of the numbers is ', median, '.')

print('\n')

#---------------------------------------------------------------------


from collections import Counter


c = Counter(L) # Creates tuples list (element, frequency)

freq = c.most_common() # most common method

max_occur = freq[0][1] # The largest frequency assigned to max_occur


if max_occur != 1:

    modes = [] # Empty List

    for m in freq:

        if m[1] == max_occur: # looking for all frequencies the same as max_occur

            modes.append(m[0])

    print('The mode(s) are: ', modes)

else:

    print('There is no mode.')

print('\n')

#---------------------------------------------------------------------


# Below is the calculation of the range.

highest = max(L)

lowest = min(L)


Range = highest - lowest

print('The range is. ', Range, '.')

print('\n')
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#----------------------------------------------------------------------------

# Below is the calculation of the variance.

S = 0 # initial value of accumulator.

for n in L:

    x = (n - mean)**2

    S = S + x


variance = S/N


print('The variance is. ', variance, '.')

print('\n')

#----------------------------------------------------------------------------


# Below is the calculation of the standard deviation


import math

standard_deviation = math.sqrt(variance)

print('The standard deviation is. ', standard_deviation, '.')

#----------------------------------------------------------------------------
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