PYTHON ASSIGNMENT

Write a Python function called sqrt2 that calculates and prints to the screen the square root of 2 to 100 decimal places. Your code should not depend on any module from the standard library or otherwise. You should research the task first and include references and a description of your algorithm.

The challenge is to write a **Python function** called sqrt2 that calculates and prints to the screen the square root of 2 to 100 decimal places. **Your code should not depend on any module from the standard library or otherwise.**

First of all it is useful to know what is the square root of 2 to 100 decimal places

1.4142135623730950488016887242096980785696718753769480731766797379907324784621

07038850387534327641572

[https://apod.nasa.gov/htmltest/gifcity/sqrt2.1mil](https://apod.nasa.gov/htmltest/gifcity/sqrt2.1mil%20) this website shows square root of 2 to million

<https://stackoverflow.com/questions/4733173/how-can-i-show-an-irrational-number-to-100-decimal-places-in-python>

Because of the limitations of floats the normal way to handle this operation in Python is to import the decimal module

Other libraries were also identified,

gmpy2

sympy

cdecimal

A basic solution would be:

**from decimal import \***

**getcontext().prec = 100**

**my\_var = Decimal(2).sqrt()**

**print(my\_var)**

1.414213562373095048801688724209698078569671875376948073176679737990732478462107038850387534327641573

**Hack the Source Code For Python Library**

Maybe it was possible to find out the source code behind the decimal library. I was only able to get so far ……

<https://www.quora.com/How-do-I-find-the-source-code-for-a-Python-library>

import decimal

print(decimal.\_\_file\_\_)

**How to Manually Calculated The Square Root Of 2**

I found best source helped me to understand how to manually calculate the square root of 2 to 100 decimal places, <https://math.stackexchange.com/questions/2301455/how-is-the-sequence-1-1-4-1-41-1-414-generated>

As the manual solution

I believed that I could code a Python solution around Range and Step

https://stackoverflow.com/questions/477486/how-to-use-a-decimal-range-step-value

Is there a way to step between 0 and 1 by 0.1?

np.linspace

np.arrange

<https://stackoverflow.com/questions/29424349/implementing-long-division-using-a-generator-function-in-python>

def decimals(number):

dividend = 1

while dividend:

yield dividend // number

dividend = dividend % number \* 10

In many of the standard textbooks discussing Real Numbers, the Cauchy sequence that converges to √ 2 is given as 1, 1.4, 1.41, 1.414, 1.4142, ... or 2, 1.5, 1.42, 1.415, 1.4143, ... My question is how are these sequences generated? In other words, if I have 1, 1.4, 1.41 how do I figure out that the next element of the sequence is 1.414?

If you keep track of how many times the needle lands on a line, it turns out to be directly related to the value of Pi. 3.1415926535 8979323846 2643383279 5028841971 6939937510 5820974944 5923078164 0628620899 8628034825 3421170679 ...

<https://byjus.com/decimal-place-value-calculator/>

<https://stackoverflow.com/questions/477486/how-to-use-a-decimal-range-step-value>

Is there a way to step between 0 and 1 by 0.1?