

CSE 231, Lab Exercise 2

Partner

Work with a partner on this exercise. Two people should work at one computer. Occasionally switch who is typing.

The Problem

You need to find the square root of a number, but unfortunately you are a poor Babylonian back in 2000 B. C. without a calculator. Fortunately, your buddy down the road has come up with a cute little algorithm (he discovered it while minding his sheep, sharp guy!) that gets a pretty good approximation of a square root. Here is the algorithm:

1. Prompt the user for a number n , of which you will find its square root
2. Make an initial *guess* of the square root ($n/2$ is a good first guess).
3. Create a new float variable *temp*
4. Set $temp = n/guess$
5. Update *guess* to have the value $guess = (guess + temp)/2$

Repeat steps 4 and 5 to get ever closer to the real answer.

Your Task

Your task is to implement the above little algorithm. (It is more commonly known as Newton's method. It is controversial whether ancient Babylonian's actually knew this algorithm). To make it simpler, iterate 5 times the step 4-5 calculation (you don't need a loop to do something exactly 5 times). Report your answer to two decimal points of accuracy.

Show your code and compiled solution to your TA to get credit for the lab.

Looking Ahead

Sometimes in lab we will ask you to try something that hasn't been taught in class yet. It gives you a chance to see what's coming.

Here is a piece of code that illustrates how a choice can be made. A number is input, a check is made to see if it is positive or negative and the appropriate message is printed. Similar code could be added to your square root program to check that the input is not negative. (We are **not** asking you to add this feature to your square root function, but you are welcome to try.)

Create a new program: type in this code and try running it.

```
input_str = input("Input a number: ")
input_int = int(input_str)

if input_int < 0:
    print("You entered a negative number.")
else:
    print("You entered a positive number")
```

Show the TA your program for credit.