

# Python Practice Tasks

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# 1 Variables

1. The assignment operator  $+=$  is used to modify (by incrementing by the value on the right) an already defined variable. Write a program that defines a variable,  $n$ , and then increases its value by 1.
2. Write a program that asks for the user's name and then insults them.
3. Write a program that asks a user for a number and prints the square of that number.
4. Write a program that prints the roots of a quadratic equation if given,  $a$ ,  $b$ , and  $c$ , where

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad (1.1)$$

5. Modify the above program to print the roots of the quadratic equation if given  $q$ ,  $e$ ,  $r$ , and  $k$  where  $(qx + e)(rx + k)$ .

## 2 Functions & Control

1. Take your program that finds the roots of the quadratic equation given  $a$ ,  $b$ , and  $c$ , and write it as a function. *Hint: as the return keyword only returns one object, you will need to find a way to combine your two  $x$  values into one object*
2. Write a function that asks for the user's age, and then gives them information about what they can or can't do at that age.
3. Write a function that returns the sum of the internal angles of a regular  $n$ -polygon.
4. Write a function that insults the user based on their favourite subject.
5. Write a function that returns the sum of the positive numbers up to  $n$ .
6. Write a function that returns the  $n$ th Fibonacci number, where the Fibonacci sequence is defined as

$$F_n = F_{n-1} + F_{n-2} \quad (2.1)$$

with  $F_0 = 0$  &  $F_1 = 1$ .

7. Write a function that calculates the factorial of a number, where the factorial function is defined for positive integers as

$$n! = \begin{cases} n(n-1)! & \text{if } n \geq 2 \\ 1 & \text{otherwise} \end{cases} \quad (2.2)$$

8. Write a function that tests the users ability to time a short period. The python module `datetime` has a function that gets the current computer time. You can import the module by using the line `import datetime as dt` and then using the function `dt.datetime.now()` to get the current time. You can add or subtract times in the usual way, and you can add or subtract intervals of time by using `dt.timedelta(seconds=10)`, shown here the time interval 10 seconds.