4330 Assignment 4 [1]

Write your code for the following problems in a single file named:

hw4-*lastname*.py

Please: name your file in exactly this way; lowercase 'hw', a dash (not an underscore), and **NO SPACES** in the filename!

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(1) (20 points)

Write a function named `sum_of_squares(n)` which takes a single argument n, and prints out all solutions to the equation

$$n = a^2 + b^2, \text{ with } a, b \in \mathbb{N}.$$

Additionally, the function should `return` the number of solutions to this equation. For example, if $n = 50$ there are three solutions:

$$\begin{aligned} 50 &= 1^2 + 7^2, \\ 50 &= 5^2 + 5^2, \\ 50 &= 7^2 + 1^2. \end{aligned}$$

So in this case, your function should print those three solutions and `return` the value 3.
Hint: You can 'nest' loops, as in the following code snippet; run it, and see what it does.

```
for a in range(1,10):
    for b in range(1,10):
        print("a={0}, b={1}".format(a,b))
```

Also note: since `=` is the assignment operator in Python, there is a different operator `==` for testing equality:

```
if a**2 + b**2 == n:
  print("{0}**2 + {1}**2 = {2}.".format(a,b,n))
```

At the bottom of the file, insert the following snippet of code:

```
while True:
    n = int(input("Enter a positive integer n: "))
    numsq = sum_of_squares(n)
    print("{0} can be written as a sum of squares in {1} ways.".\
          format(n, numsq))
```