Example - Count the number of ‘a’s

Write a program that outputs the number of ‘a’s in it

How can we use an accumulator pattern to count the number of ‘a’s?
   What should the variable be?
   What should its initial value be?
   How many times should we loop?
   How should we update the accumulator each iteration?

What steps does the program need to do?
   Write them on paper first!

$ python3 count.py
Enter a word: Carrot
Number of a’s in Carrot: 1

$ python count.py
Enter a word: mouse
Number of a’s in mouse: 0
Algorithm

Ask the user for a word

Initialize an accumulator to count the a’s

Repeat for each character in the word

    if the character an ‘a’:
        increment the accumulator

Print the accumulator
Write a program that outputs the number of 'a' s in a given word

```python
# import necessary libraries

def main():
    word = input("Enter a word: ")
    numCharacters = len(word)
    numAs = 0
    for i in range(numCharacters):
        currentCharacter = word[i]
        if currentCharacter == "a":
            numAs = numAs + 1
    print("Number of a's in %s: %d"%(word, numAs))

main()
```
Tracing the program execution

numAs = 0

word = “cats”

<table>
<thead>
<tr>
<th>Iteration</th>
<th>i</th>
<th>word[i]</th>
<th>currentCharacter == “a”</th>
<th>numAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>“c”</td>
<td>False</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>“a”</td>
<td>True</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>“t”</td>
<td>False</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>“s”</td>
<td>False</td>
<td>1</td>
</tr>
</tbody>
</table>
Exercise - Check for ‘a’

Write a program that outputs whether a given word has the letter ‘a’ in it

Algorithm
   Ask user for a word

   Define a boolean flag variable
      What should its initial value be?

   Loop over word
      If you see an ‘a’, set flag to True

   Output result based on the flag

$ python3 acheck.py
Enter a word: Carrot
Carrot has an a in it.

$ python acheck.py
Enter a word: mouse
mouse does not have an a in it.
Exercise - Fizzbang

Write a program that loops through the integers 1 to 25 and prints the following:

- if the number of divisible by 3, prints Fizz
- if the number is divisible by 5, prints Bang
- if the number is divisible by both 3 and 5, prints FizzBang
- otherwise prints the number

$ python3 fizzbang.py
1
2
Fizz
4
Bang
Fizz
7
8
Fizz
Bang
11
Fizz
13
14
FizzBang
.