Week 3

Strings and Loops

String accumulators

String formatting

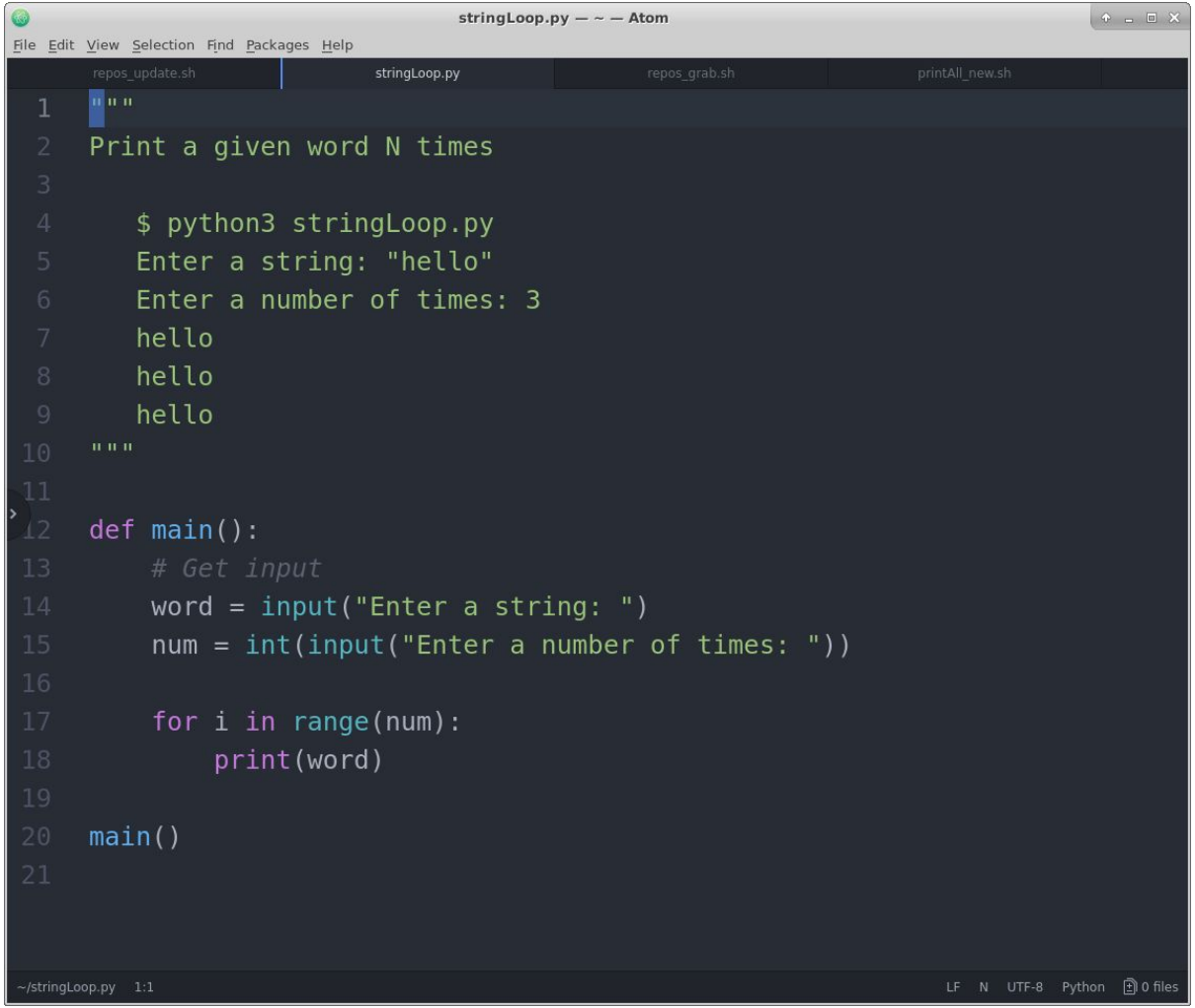
Booleans

Conditionals

Strings and loops

We can use loops to generate patterns of strings

```
# Print greeting 5 times
greeting = “hello world”
for i in range(5):
    print(greeting)
```

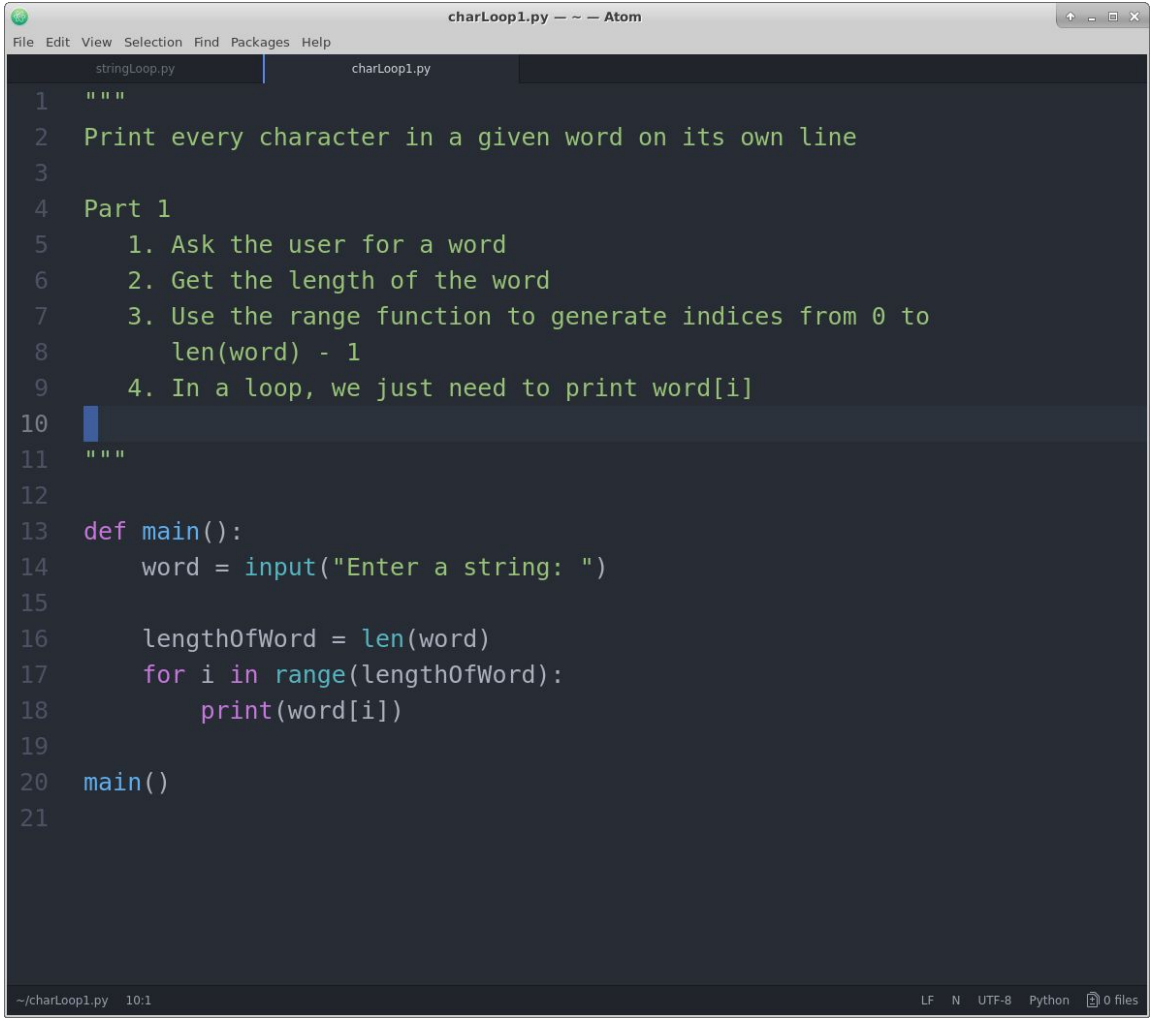

stringLoop.py — ~ — Atom
File Edit View Selection Find Packages Help
repos_update.sh
stringLoop.py
repos_grab.sh
printAll_new.sh
"""
Print a given word N times
$ python3 stringLoop.py
Enter a string: "hello"
Enter a number of times: 3
hello
hello
hello
"""
def main():
# Get input
word = input("Enter a string: ")
num = int(input("Enter a number of times: "))
for i in range(num):
print(word)
main()
~/stringLoop.py 1:1
LF N UTF-8 Python 0 files

More strings and loops

Strings are a sequence of characters!

What is the output of the following program?

```
greeting = “hello world”
for i in range(len(greeting)):
    print(greeting[i])
```


charLoop1.py — ~ — Atom
File Edit View Selection Find Packages Help
stringLoop.py
charLoop1.py
"""
Print every character in a given word on its own line
Part 1
1. Ask the user for a word
2. Get the length of the word
3. Use the range function to generate indices from 0 to
len(word) - 1
4. In a loop, we just need to print word[i]
"""
def main():
word = input("Enter a string: ")
lengthOfWord = len(word)
for i in range(lengthOfWord):
print(word[i])
main()
~/charLoop1.py 10:1
LF N UTF-8 Python 0 files

Strings can be accumulators

Idea: We can use loops to generate strings

```
accum = …

for i in range(...):

    # do something
```

Strings can be accumulators

Idea: We can use loops to generate strings

accum = “” # usually initialize with the empty string

```
for i in range(...):
    # do something
```

Strings can be accumulators

Idea: We can use loops to generate strings

```
accum = “” # usually initialize with the empty string

for i in range(...):

    # Use concatenation to add to the string

    accum += …
```

Exercise - Substrings

1. Ask the user for a word
2. Output increasing substrings of the input

Step 1: Sketch the algorithm on paper

What are we accumulating?

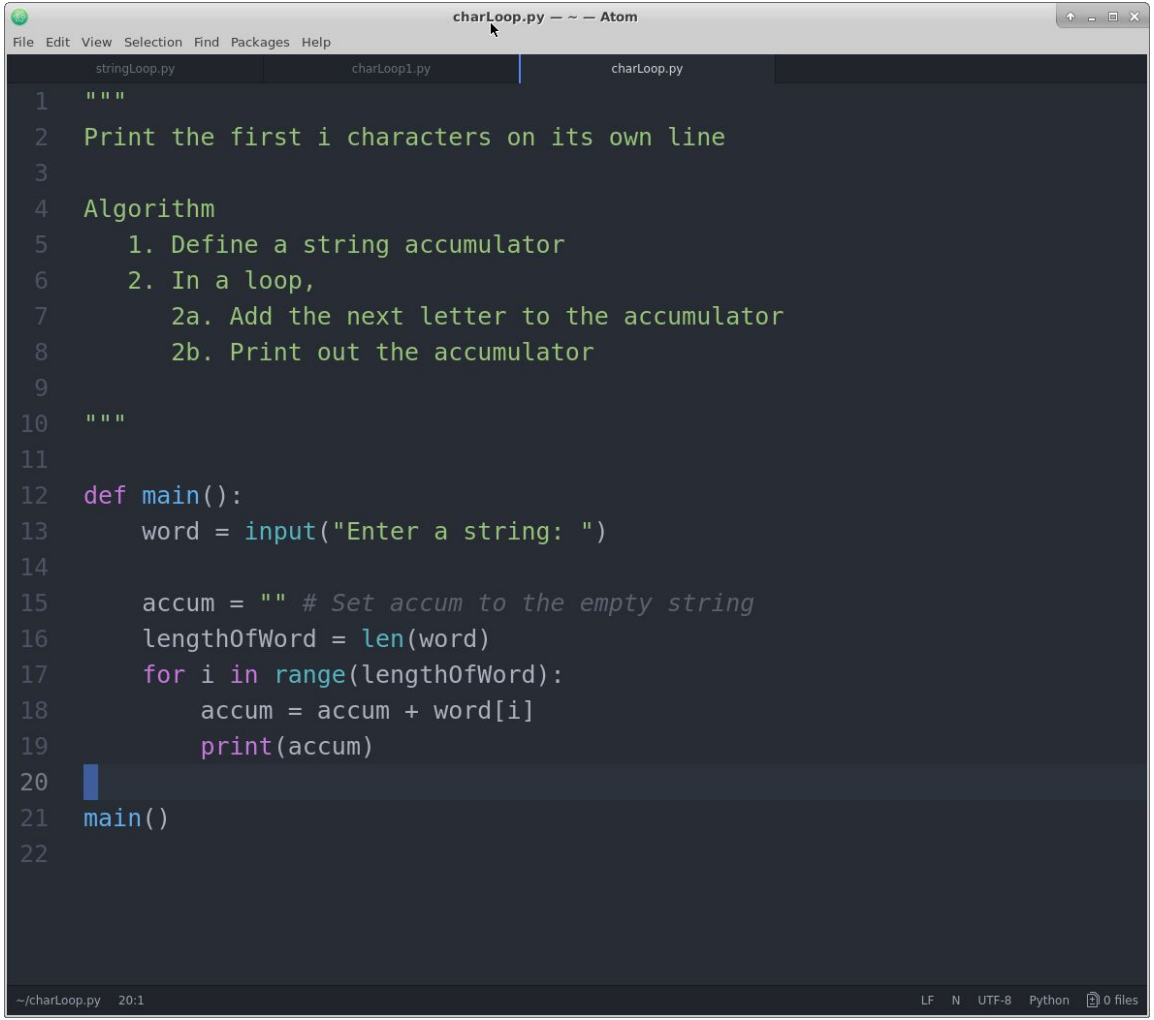
What should the start value be?

How should you update each frame?

How many times should you loop?

Step 2: Implement the algorithm with code

```
$ python3 substrings.py
Enter a word: Crackle
C
Cr
Cra
Crac
Crack
Crackl
Crackle
```


charLoop.py — ~ — Atom
File Edit View Selection Find Packages Help
stringLoop.py
charLoop1.py
charLoop.py
"""
Print the first i characters on its own line
Algorithm
1. Define a string accumulator
2. In a loop,
2a. Add the next letter to the accumulator
2b. Print out the accumulator
"""
def main():
word = input("Enter a string: ")
accum = "" # Set accum to the empty string
lengthOfWord = len(word)
for i in range(lengthOfWord):
accum = accum + word[i]
print(accum)
main()
~/charLoop.py 20:1
LF N UTF-8 Python 0 files

How does the accumulator change each iteration?

word = “hello”
accum = “”

Iteration	**i**	**word[i]**	**accum**
1	0	“h”	accum = “” + “h” = “h”
2	1	“e”	accum = “h” + “e” = “he”
3	2	“l”	accum = “he” + “l” = “hel”
4	3	“l”	accum = “hel” + “l” = “hell”
5	4	“o”	accum = “hell” + “o” = “hello”

Exercise - Square of text

1. The user will input the size N that the square should be
2. Output N lines. Each line repeats “*” N times

Hint: Use the * operator to repeat a character based on size

Step 1: Write out the algorithm on paper

How to generate a single line?

How to repeat that line N times?

Step 2: Implement the algorithm with code

```
$ python3 square.py
Enter an integer: 1
*

$ python3 square.py
Enter an integer: 4
****
****
****
****
```

Exercise - Double letters

1. Ask the user for a word
2. Output the word with each letter doubled

Step 1: Sketch the algorithm on paper

What are we accumulating?

What should the start value be?

How should you update each frame?

How many times should you loop?

Step 2: Implement the algorithm with code

```
$ python3 doubleletter.py
Enter a word: banana
bbaannaannaa

$ python3 doubleletter.py
Enter a word: lol
llooll
```