ITP 115

Lists and Strings

find()

- Searches a string for first match of a substring
- Returns a <u>index</u> the first match
- Syntax

```
index = string.find(subString)
```

Example `find()`

```
food    = "fish taco"

index   = food.find("c")

index   = food.find(" ")

newFood = food[index+1:]
```

food

0	1	2	3	4	5	6	7	8
f	i	s	h		t	a	c	o

index

7

index

4

newFood

0	1	2	3
t	a	c	o

Lists and Strings

- `list()` method
- `join()` method
- `split()` method

`newList = list(someString)`

- Converts string to list

- Returns a <u>list</u> of all characters in **`someString`**

- Strings are immutable so we can use **`list()`** to
  - convert string → list
  - manipulate letters in list (e.g. replace or remove)
  - convert list → string *(more on this in a moment)*

Example `list()`

```
word = "stir"
```

word	stir

```
ltrList = list(word)
```

ltrList	0	1	2	3
	s	t	i	r

```
ltrList[1] = "p"
```

ltrList	0	1	2	3
	s	p	i	r

```
ltrList.append("e")
```

ltrList	0	1	2	3	4
	s	p	i	r	e

```
print(ltrList)
```

```
['s','p','i','r','e']
```

`newString = delimiter.join(aList)`

- Converts list of strings into a new string
- Returns a <u>string</u> by combining elements in the list
- Elements are separated by the **delimiter**
- **Delimiter** can be any string
  - Common delimiters are be `" "` or `","`

Example `join()`

```
# from before
ltrList
```

ltrList

0	1	2	3	4
s	p	i	r	e

```
word = "^-".join(ltrList)
```

Example `join()`

```
# from before
ltrList
```

ltrList

0	1	2	3	4
s	p	i	r	e

```
word = "^-".join(ltrList)
```

Combines each element of the list

word

s^-p^-i^-r^-e

Example join()

```
# from before
ltrList
```

ltrList

0	1	2	3	4
s	p	i	r	e

```
word = "^-".join(ltrList)
```

word

s^-p^-i^-r^-e

Separated by this string (called a *delimiter)*

Example join()

```
# from before
ltrList

word = "^-".join(ltrList)
```

Creates a new string

ltrList

0	1	2	3	4
s	p	i	r	e

word

s^-p^-i^-r^-e

Example join()

```
# from before
ltrList
```

ltrList

0	1	2	3	4
s	p	i	r	e

```
word = "^-".join(ltrList)
```

word: s^-p^-i^-r^-e

```
word = "".join(ltrList)
```

word: spire

Empty string can be a delimiter

Example join()

```
wordList = ["Always","look","on","the","bright","side","of","life"]
```

wordList

0	1	2	3	4	5	6	7
Always	look	on	the	bright	side	of	life

```
quote = " ".join(wordList)
```

quote Always look on the bright side of life

```
print(quote)
```

```
Always look on the bright side of life
```

`newList = someString.split(delimiter)`

- Separates a string that contains **delimiters** into a list

- Returns a <u>list</u> by separating string everywhere there is a **delimiter** in the string

- **Delimiter** can be any string
  - Common delimiters are be `" "` or `","`

Strings with Delimiters

- **Delimiter** can be any string
  - Common delimiters are be `" "` or `","`

- Ex:

```
"Ron Weasley,Gryffindor,Red hair"
```

Delimiters

```
"Cho Chang,Ravenclaw,Black hair"
```

Delimiters

Example `split()`

```
nameString = "Cho,Dean,Luna"
```

```
nameString  Cho,Dean,Luna
```

String includes delimiters

Example `split()`

```
nameString = "Cho,Dean,Luna"
```

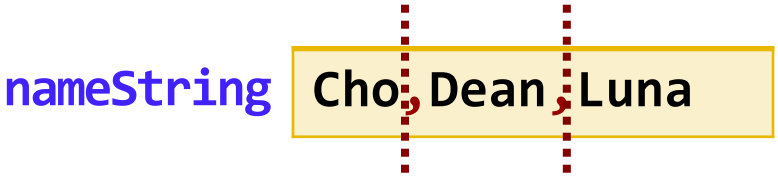
nameString `Cho,Dean,Luna`

```
nameList = nameString.split(",")
```

Tell split() what is the delimiter

Example split()

```
nameString = "Cho,Dean,Luna"
```




```
nameList = nameString.split(",")
```

Split() divides separates where the delimiters are

Example split()

```
nameString = "Cho,Dean,Luna"

nameList = nameString.split(",")
```

nameString: Cho,Dean,Luna

nameList

0	1	2
Cho	Dean	Luna

split() vs. strip()

```
line = "  Hello my name is Rob\n\n   "
```

```
aString = line.strip()
print(aString)
```

```
"Hello my name is Rob"
```

strip() **removes whitespace** from the beginning and end of a string

split() vs. strip()

```
aString = "Hello my name is Rob"
```

```
aList = aString.split(" ")
print(aList)
```

```
["Hello", "my", "name", "is", "Rob"]
```

split() **separates** a string into a list (where there is a **delimiter**)

Reminders

- Associated with strings (aka string methods)

```
join        someString.join( … )
split       someString.split( … )
strip       someString.strip( … )
```

FOR REFERENCE ONLY

Tuples

- Tuples are sequences like lists, but tuples are **immutable**
  - You can NOT change a value in a tuple once it is created

- Tuples behave similarly to lists
  - Tuples can contain elements of any type

Tuples

- Syntax

```
tupleVariable = (item1, item2, ...)
```

- `item1` could be any type of variable
  - string: `"hello"`
  - int: `7`
  - float: `8.5`
  - List: `["this is", "another list"]`
  - Any other variable type we will cover

Example

```python
# create an empty tuple
food = ()

# treat the tuple as a condition
if not food:
    print("You don't have any food.")

# create a tuple with some items
food = ("chocolate", "milk", "bread",
"eggs")

# print the tuple
print("The tuple food is: ", food)

# print each element in the tuple
print("Your food items:")
for item in food:
    print(item)
```

```
You don't have any food.

The tuple food is:
 ('chocolate', 'milk', 'bread', 'eggs')

Your food items:
chocolate
milk
bread
eggs
```

Tuples as Sequence

- Since tuples are sequences, you can manipulate them like strings and lists

- Example

```
things = ("emu", "pig")
stuff = ("dog", "cat", "boa")

things += stuff              # concatenate
animal = stuff[0]            # index operator
length = len(stuff)          # len operator
if "dog" in stuff:           # in operator
  print("Found Dog")
```

Tuples are Immutable

```
drinks = ("coffee", "latte", "espresso")

drinks[0] = "americano"
```

```
TypeError: 'tuple' object does not support
item assignment
```

Why Use Tuples Instead of Lists

- Tuples are faster than lists
- Tuples' immutability makes them perfect for creating constants since they can't change
- Using tuples can add a level of safety and clarity to your code
- Sometimes tuples are required
  - In some cases, Python requires immutable values