

Objectives

- More Strings!
- Exam review

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Review

- How do you put a tab in a string?
- What is the general name for characters like tab?
 - What are other examples?
- How do you “get” a certain character in a string?
- How do you iterate through a string?
- Can you modify the contents of a string?

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Review: Strings

- Actually a *sequence* of characters

➤ Example:

band = “The Beatles”

characters

'T'	'h'	'e'	' '	'B'	'e'	'a'	't'	'l'	'e'	's'
0	1	2	3	4	5	6	7	8	9	10

Start at 0

index or position of characters

Length of the string: 11
Built-in function: `len(string)`
to find length of a string

End at `len()-1`

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Review: Iterating Through a String

- For each character in the string

string of length 1

```
for char in string:  
    print(char)
```

'T'	'h'	'e'	' '	'B'	'e'	'a'	't'	'l'	'e'	's'
0	1	2	3	4	5	6	7	8	9	10

An integer

```
for pos in range(len(string)):  
    print(string[pos])
```

- For each position in the string

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Review: Substrings Operator []

- Look at a particular character in the string
 - Syntax: `mystr[<integer expression>]`
 - [Positive value]: index of character
 - [Negative value]: count backwards from end
- Look at a sequence of characters in the string
 - Syntax: `mystr[<start>:<end>]`

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Review: Testing for Substrings

- Using the `in` operator
 - Used `in` before `for` loops
- Syntax:

```
substring in mystring:
```

 - Evaluates to True or False
- Example:

```
if "Jr." in name:  
    print name, "contains 'Jr.'"
```

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Format Specifiers

[] mean optional

- General format: `%[flags][width][.precision]code`
 - flags:
 - 0: zero fills
 - +: adds a + sign before positive values
 - : left-justification (default is right-justification)
 - width:
 - Minimum number of character spaces reserved to display the entire value
 - Includes decimal point, digits before and after the decimal point and the sign

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Format Specifiers

- General format: `%[flags][width][.precision]code`
 - precision:
 - Number of digits after the decimal point for **floating point** values
 - code:
 - Indicates the value's **type**/how to format

Code	Type
s	string
d or i	integer
f	float
e	floating point with exponent

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Example using Format Operator

```

print("Your item that cost (%.2f)" % value)
print("costs %.2f with tax" % tax)

Alternative:
print("Your item that cost (%.2f) costs %.2f with tax" % (value, tax))
    
```

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Formatting Practice

- x = 10
- y = 3.5
- z = "apple"
- "%.2f" % x
- "%.2d" % x
- "%06.2f" % y
- "%+6.2f" % y
- "%-10s" % z
- "%5d %-7.3f" % (x,y)

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Example: Printing Out Tables

- A table of temperature conversions

Temp F	Temp C	Temp K
-459.7	-273.1	0.0
0.0	-17.8	255.2
32.0	0.0	273.1

- If we want to print data in rows, what is the template for what a row looks like?
 - How do we make the column labels line up?

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temp_table.py 17

USING THE STR API

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Review

- What is an API?
- How do we call methods on an object?

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str Methods

- **str** is a **class** or a **type**
- **Methods**: available operations to perform on **str** objects
 - Provide common functionality
- To see all methods available for **str** class
 - **help(str)**

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str Methods

- Example method: **find(substring)**
 - Finds the index where substring is in string
 - Returns -1 if substring isn't found
- To call a method:
 - **<str_obj>.methodname([arguments])**
 - Example: **filename.find(".py")**

Executed on this string

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Common str Methods

Method	Operation
center(width)	Returns a copy of string centered within the given number of columns
count(sub[, start [, end]])	Return # of non-overlapping occurrences of substring sub in the string.
endswith(sub), startswith(sub)	Return True iff string ends with/begins with sub
find(sub[, start [, end]])	Return first index where substring sub is found
isalpha(), isdigit(), isspace()	Returns True iff string contains letters/digits/whitespace only
lower(), upper()	Return a copy of string converted to lowercase/uppercase

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Sprenkle - CSCI111 **string_methods.py**

Common str Methods

Method	Operation
replace(old, new[, count])	Returns a copy of string with all occurrences of substring old replaced by substring new . If count given, only replaces first count instances.
split([sep])	Return a list of the words in the string, using sep as the delimiter string. If sep is not specified or is None, any whitespace string is a separator.
strip()	Return a copy of the string with the leading and trailing whitespace removed
join(<sequence>)	Return a string which is the concatenation of the strings in the sequence with the string this is called on as the separator
swapcase()	Return a copy of the string with uppercase characters converted to lowercase and vice versa.

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String Methods vs. Functions

Functions

- All "input" as arguments/parameters
- Example: **len** is a built-in function
 - Called as **len(strobj)**

Methods

- "Input" are argument/parameters **and** the string the method was called on
- Example:
 - **strobj.upper()**

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Are You Smarter Than a 5th Grader?

- Problem in spelling from the show: How many a's are in abracadabra?
 - Solve using `str` methods

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Verifying User Input

- How can we verify that the user entered the lottery number in the correct format?
 - Review: What was the correct format?

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Looking Ahead

- Lab tomorrow
 - Strings
- Exam Wednesday

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