



Introduction to Programming

Spring 2022

Objects and Graphics

- The String Data Type
- Simple String Processing
- List as Sequences
- **String Representation and Message Encoding**
- **String Methods**
- **Lists Have Methods too**
- From Encoding to Encryption
- Input/Output as String Manipulation
- File Processing

String Representation

- Inside the computer, strings are represented as sequences of 1's and 0's, just like numbers.
- A string is stored as a sequence of binary numbers, one number per character.
- It doesn't matter what value is assigned as long as it's done consistently.

String Representation

- In the early days of computers, each manufacturer used their own encoding of numbers for characters.
- ASCII system (American Standard Code for Information Interchange) uses 7 bits codes (can have 127 characters)
- Python supports Unicode (100,000+ characters)

String Representation

- The `ord` function returns the numeric (ordinal) code of a single character.

- The `chr` function converts a numeric code to the corresponding character.

- Example

```
ord("A")
```

```
ord("a")
```

```
chr(97)
```

```
chr(65)
```

```
chr(193)
```

```
chr(169)
```

String Methods

Operator	Meaning
+	Concatenation
*	Repetition
string[]	Indexing
string[:]	Slicing
len(string)	Length
for var in string for index in range(len(string))	Iteration through characters Iteration through index

String Methods

- Syntax

- string.methodName (<param1>, <param2>, ...)

- capitalize() – Copy of string with only the first character capitalized

- title() – Copy of string first character of each word capitalized

- center(width) – Center string in a field of given width

String Methods

- `count(sub)` – Count the number of occurrences of `sub` in string
- `find(sub)` – Find the first position where `sub` occurs in string
- `join(list)` – Concatenate list of strings into one large string using string as separator.
- `lower()` – Copy of string in all lowercase letters
- `split()` – Split string into a list of substrings
- `upper()` – Copy of string all characters converted to uppercase

List Methods

•Syntax

- `list.methodName (<param1>, <param2>, ...)`
- append – add an item to end of the list

Class Work

- Write a program that:
 - counts the number of words in a sentence entered by a user
 - counts the total number of characters (not including spaces) in a sentence entered by a user
 - calculates the average word length in a sentence entered by a user