

More About Strings

Programming and Algorithms

Lecture by
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```
n = 3
for i in range(1,n+1):
    print("Hello World!")
```

Hello World!
Hello World!
Hello World!

What will we Cover?

- Strings as a character sequence
- Processing strings

String Data Type

- String is a sequence of characters
 - The characters can be letters, numbers or symbols on a keyboard
- String is immutable
 - Once created, it cannot be changed
 - However, it can be reassigned

Converting Other Data Types to Strings

Other data types can be converted to strings using the `str()` function

Integer

```
n = 5  
n_string = str(n)  
n_string
```

'5'

Float

```
f = 0.45  
f_string = str(f)  
f_string
```

'0.45'

Boolean

```
b = True  
b_string = str(b)  
b_string
```

'True'

Accessing String Characters

- Strings are sequences, so their elements (characters) can be accessed using indexing
 - Use `[]` and index to access a character in a string
 - Indexing starts from position `[0]` (first character has an index of)
 - To access last position, use `[-1]`

List Functions for Strings I

- `min(string)` – used to find a character with the smallest value in the string
- `max(string)` – used to find a character with the largest value in the string

Example	Result
<pre>str1 = "apple" min(str1)</pre>	'a'
<pre>str2 = "apple" max(str2)</pre>	'p'

List Functions for Strings II

- `len(string)` – used to find the length (number of characters) of a string

Example	Result
<pre>str3 = "abc" len(str3)</pre>	3

Examples I

Third character

```
str1 = 'string'  
print(str1[2])
```

r

Last character

```
str2 = 'string'  
print(str1[-1])
```

g

Length of a list

```
str5 = 'string'  
print(len(str5))
```

6

Minimum value

```
str3 = 'string'  
print(min(str3))
```

g

Maximum value

```
str4 = 'string'  
print(max(str4))
```

t

More on MAX and MIN functions

- For strings, `min()` and `max()` functions compare the characters based on their ASCII values
- ASCII is a standard way of assigning numerical values to characters
 - Uppercase letters have lower ASCII values than lowercase letters
 - Numbers have lower ASCII values than letter
 - Most symbols have lower ASCII values than numbers
 - More on the ASCII table: <https://www.asciitable.com/>

Examples II

Minimum value

```
str6 = '1Aa'  
print(min(str6))
```

1

```
str8 = 'a1.'  
print(min(str8))
```

.

Maximum value

```
str7 = 'Wa'  
print(max(str7))
```

a

```
str9 = '.1A'  
print(max(str9))
```

A

Try It Yourself

Write a program to find the first letter, last letter and the length of a string entered by the user