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NGEE ANN
SCHOOL OF INFOCOMM TECHNOLOGY

String Manipulation

Programming I (PRG1)
Diploma in Information Technology
Diploma in Financial Informatics
Diploma in Information Security & Forensics
Year 1 (2018/19), Semester 1

Objectives

At the end of this lecture, you will learn how to

- Access characters in strings
- How to manipulate strings

Accessing Characters in Strings

- A ***string*** is a **sequence of characters**.
- Use the bracket operator to access a character in the string.

```
>>> name = 'Ngee Ann'
>>> name[1]
'g'
```

name	N	g	e	e		A	n	n
position	0	1	2	3	4	5	6	7

- Positions of a string's characters are numbered from 0, on the left, to the length of the string minus one.
- Use negative index to access characters from right to left.

```
>>> name[-1]
'n'
>>> name[-3]
'A'
```

String Slices

- A segment of a string is called a ***slice***.
- Use the [n:m] operator to access part of the string from position n to m.

```
>>> name[0:4]
'Ngee'
```

name	N	g	e	e		A	n	n
position	0	1	2	3	4	5	6	7

– If the first index is omitted, the slice starts from the beginning of the string.

– If the second index is omitted, the slice goes to the end of the string.

```
>>> name[:4]
'Ngee'
>>> name[5:]
'Ann'
```

Other String Operators

Operator	Description	Example a='Hello'; b='Python'
+	Concatenation - Adds values on either side of the operator	a + b Answer: 'HelloPython'
*	Repetition - Creates new string, concatenating multiple copies of the same string	a*2 Answer: 'HelloHello'
in	Membership - Returns true if a character exists in the given string	'H' in a Answer: True
not in	Membership - Returns true if a character does not exist in the given string	'M' not in a Answer: True

Built in function

- **len(word)**
- Returns the length of the string

```
>>> len(name)
8
```

name	N	g	e	e		A	n	n
position	0	1	2	3	4	5	6	7

Built in string methods

Function	Description	Example a='Hello Python'
capitalize()	Returns a copy of the string with its first character capitalized and the rest lowercased.	a.capitalize() Answer: **'Hello python'**
lower()	Converts all uppercase letters in string to lowercase	a.lower() Answer: **'hello python'**
upper()	Converts all lowercase letters in string to uppercase	a.upper() Answer: **'HELLO PYTHON'**
find(str[, beg[, end]])	Determine if str occurs in string or in a substring of string if starting index beg and ending index end are given. Returns index if found and -1 otherwise	a.find('on') Answer: **10** a.find('ON') Answer: **-1**

Built in string methods

Function	Description	Example a='Hello Python'
replace(old, new [, max])	Replaces all occurrences of old in string with new or at most max occurrences if max given	a.replace(o', z') Answer: **'Hellz Pythzn'** a.replace(o', z', 1) Answer: **'Hellz Python'**
isalpha()	Returns true if string has at least 1 character and all characters are alphabetic and false otherwise	a.isalpha() Answer: **False**
isdigit()	Returns true if string contains only digits and false otherwise	a.isdigit() Answer: **False**
isalnum()	Returns true if string has at least 1 character and all characters are alphanumeric and false otherwise	a.isalnum() Answer: **False**

Activity 1

You will have some simple practice with String Manipulation. This is followed by writing some programs that apply String Manipulation techniques.

Reading Reference

- How to Think Like a Computer Scientist: Learning with Python 3
  - Chapter 8
  - http://openbookproject.net/thinkcs/python/english3e/index.html

Summary

- Accessing Characters in Strings
- String Manipulation