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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 Cybersecurity & Digital Forensics

Common ICT Programme

Year 1 (2019/20), 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 **[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 Ans: 'HelloPython'
*	Repetition - Creates new string, concatenating multiple copies of the same string	a*2 Ans: 'HelloHello'
in	Membership - Returns true if a character exists in the given string	'H' in a Ans: True
not in	Membership - Returns true if a character does not exist in the given string	'M' not in a Ans: True

Built in String 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 functions

Function	Description	Example a='Hello Python'
capitalize()	Returns a copy of the string with its first character capitalized and the rest lowercased.	a.capitalize() Ans: 'Hello python'
lower()	Converts all uppercase letters in string to lowercase	a.lower() Ans: 'hello python'
upper()	Converts all lowercase letters in string to uppercase	a.upper() Ans: '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') Ans: 10 a.find('ON') Ans: -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
split()	Splits the string into substrings if it finds instances of the separator	a.split(" ") Answer: ['Hello', 'Python']

Activity 1

- Given message = 'Welcome to ICT' , determine the output:

Python code	Output
>>> len(message)	
>>> message.find('ICT')	
>>> message.replace('ICT','NP')	
>>> message[10]	
>>> message[11:14]	
>>> 'NP' in message	
>>> message[22]	

Activity 2

- **Assume that string s1 = 'Programming 1' & s2 = 'PRG1', perform the following:**

	Python code	Output
Determine the length of string s1	>>> len(s1)	
Check if s1 has even number of characters	>>> len(s)%2 == 0	
Replace every character 'g' in string **s1** with character 'z'.	>>> s1.replace('g','z')	
Append the string **s2** to the string **s1**	>>> s1 = s1 + ' ' + s2	
Check if string **s1** starts and ends with the same character	>>> s1[0] == s1[-1]	

Activity 3

- Assume that string s3 = '10;20;30', perform the following:

	Python code	Output
Splits the string s3 into substrings using separator ';'	>>> s3.split()	
Retrieve float value '10' from string s3	>>> index = s3.find(';') >>> s3[0:index]	
Retrieve value '20' from the string s3	>>> temp = s3[index+1:] >>> temp[0:index]	

Activity 4 – DeleteString.py

- **Write a Python program to**
  - ✓ Prompt user to input the original string and substring to delete
  - ✓ Remove the first occurrence of the substring from the original string
  - ✓ Display the modified string

```
Enter original string : To eat or not to eat
Substring to delete : or

The modified string is : To eat  not to eat
```

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