Marwadi University Marwadi Chandarana Group NAAC A+	**Marwadi University** **Faculty of Engineering & Technology** **Department of Information and Communication Technology**	
Subject: Programming With Python (01CT1309)	**Aim:** Write a program to create, concatenate and print a string and accessing substring from a given string.	
Experiment No: 03	**Date:**	**Enrollment No: 92400133110**

Aim: Write a program to create, concatenate and print a string and accessing substring from a given string.

IDE:

Slicing and indexing are two fundamental concepts in Python. They help us access specific elements in a sequence, such as a string or (list and tuple).

Indexing in Python

Indexing is the process of accessing an element in a sequence using its position in the sequence (its index). In Python, indexing starts from 0, which means the first element in a sequence is at position 0, the second element is at position 1, and so on. To access an element in a sequence, you can use square brackets [] with the index of the element you want to access.

Let's consider the following example:

create a string using double quotes string1
= "ICT Department"
print(string1)
# create a string using single quotes string1
= ' ICT Department '
print(string1)
Output

```
1   string1 = "ICT Department"
2   print(string1)
3   string1 = ' ICT Department '
4   print(string1)
```

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

PS C:\Users\karth> & C:/Users/karth/AppData/
h/OneDrive/Documents/New folder/KARTHIK JAVA
ICT Department
 ICT Department
```

Access String Characters in Python string2
= '3EK1'
# access 1st index element
print(string2 [1])

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Output:

```
1   string2 = '3EK1'
2   print(string2 [1])
```

```
PROBLEMS    OUTPUT    DEBUG CONSOLE

PS C:\Users\karth> & C:/Users/kar
nts/New folder/KARTHIK JAVA/PYTHO
E
```

Negative Indexing:
Python allows negative indexing for its strings. For example,
string3 = 'ICT Department' # access 4th last element
print(string3 [-4]) output:

Slicing in Python

Slicing is the process of accessing a sub-sequence of a sequence by specifying a starting and ending index. In Python, you perform slicing using the colon: operator. The syntax for slicing is as follows:

Example:

sequence[start_index:end_index]

where start_index is the index of the first element in the sub-sequence and end_index is the index of the last element in the sub-sequence (excluding the element at the end_index). To slice a sequence, you can use square brackets [] with the start and end indices separated by a colon.

For example, string4 =
'ICT Department'
access character from 1st index to 3rd index
print(string4[1:4]) Output:

```
1   string4 = 'ICT Department'
2   print(string4[1:4])
3
```

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

PS C:\Users\karth> & C:/Users/karth/AppData
h/OneDrive/Documents/New folder/KARTHIK JAV
CT
```

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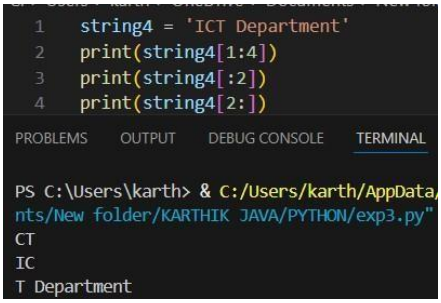
You can also omit either the start_index or the end_index in a slice to get all the elements from the beginning or end of the sequence. For example:
print(string4[:2])
print(string4[2:]) output:



In the first line of the above code, we have used slicing to get all the elements from the beginning of string4 up to (but not including) the element at index 2. In the second line, we have used slicing to get all the elements from index 2 to the end of string4.

Python Strings are Immutable

In Python, strings are immutable. That means the characters of a string cannot be changed. For example, message = 'ICT Department' message[0] = 'H' print(message) Output:

However, we can assign the variable name to a new string. For example, message
= 'ICT'
# assign new string to message variable
message = 'ICT Department' print(message)

Python Multiline String
We can also create a multiline string in Python. For this, we use triple double quotes """ or triple single quotes '''.
For example,
multiline string

message = """ ICT
Department

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3EK1
""" print(message)
Output:

```
1   message = """
2   ICT
3   Department
4   3EK1
5   """
6   print(message)
7
```

```
PROBLEMS    OUTPUT    DEBUG CONSOLE

PS C:\Users\karth> & C:/Users/kar
nts/New folder/KARTHIK JAVA/PYTHO

ICT
Department
3EK1
```

Python String Operations

Many operations can be performed with strings, which makes it one of the most used data types in Python.

1. **Compare Two Strings**
For example, str1 =
"ICT" str2 =
"Department" str3 =
"3EK1"
compare str1 and str2
print(str1 == str2) #
compare str1 and str3
print(str1 == str3)
Output:

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```
1   str1 = "ICT"
2   str2 = "Department"
3   str3 = "3EK1"
4   print(str1 == str2)
5   print(str1 == str3)
6
```

```
PROBLEMS    OUTPUT    DEBUG CONSOLE

PS C:\Users\karth> & C:/Users/ka
nts/New folder/KARTHIK JAVA/PYTH
False
False
```

2. **Join Two or More Strings**

In Python, we can join (concatenate) two or more strings using the + operator.
greet = "ICT" name = "Department" # using + operator result = greet + name
print(result) Output:

```
1   greet = "ICT"
2   name = "Department"
3   result = greet + name
4   print(result)
5
```

```
PROBLEMS    OUTPUT    DEBUG CONSOLE

PS C:\Users\karth> & C:/Users/kart
nts/New folder/KARTHIK JAVA/PYTHON
ICTDepartment
```

Python String Length

In Python, we use the len() method to find the length of a string. For example, greet
= 'ICT'
count length of greet string print(len(greet))

Output:

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```
1   greet = 'ICT'
2   print(len(greet))
3
```

```
PROBLEMS    OUTPUT    DEBUG CON

PS C:\Users\karth> & C:/User
nts/New folder/KARTHIK JAVA/
3
```

String Membership Test

We can test if a substring exists within a string or not, using the keyword in.

print('a' in 'program') print('at'
not in 'battle')

Methods of Python String

Python String upper()

The upper() method converts all lowercase characters in a string into uppercase characters and returns it.

message = 'python is fun' # convert message to uppercase print(message.upper()) Output:

```
1   message = 'python is fun'
2   print(message.upper())
3
```

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TE

PS C:\Users\karth> & C:/Users/karth/A
nts/New folder/KARTHIK JAVA/PYTHON/ex
PYTHON IS FUN
```

Python String lower()

The lower() method converts all uppercase characters in a string into lowercase characters and returns it.

message = 'PYTHON IS FUN' #
convert message to lowercase
print(message.lower())

Output:

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```
1   message = 'PYTHON IS FUN'
2   print(message.lower())
3
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
PS C:\Users\karth> & C:/Users/karth/AppData/Lo
nts/New folder/KARTHIK JAVA/PYTHON/exp3.py"
python is fun
```

Python String replace()

The replace() method replaces each matching occurrence of a substring with another string.
text = 'CE Department' replaced_text = text.replace('CE', 'ICT') print(replaced_text)
Output:

```
1   text = 'CE Department'
2   replaced_text = text.replace('CE', 'ICT')
3   print(replaced_text)
4
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\karth> & C:/Users/karth/AppData/Local/Progr
nts/New folder/KARTHIK JAVA/PYTHON/exp3.py"
ICT Department
```

Python String find()

The find() method returns the index of first occurrence of the substring (if found). If not found, it returns -1.
message = 'Python is a fun programming language'
# check the index of 'fun'
print(message.find('fun')) Output:

```
1   message = 'Python is a fun programming language'
2   print(message.find('fun'))
3
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\karth> & C:/Users/karth/AppData/Local/Programs/Pyt
nts/New folder/KARTHIK JAVA/PYTHON/exp3.py"
12
```

Python String rstrip()

The rstrip() method returns a copy of the string with trailing characters removed (based on the string argument passed).

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title = 'Python Programming '
result = title.rstrip()
print(result) Output:

```
1  title = 'Python Programming  '
2  result = title.rstrip()
3  print(result)
4
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINA
PS C:\Users\karth> & C:/Users/karth/AppDat
nts/New folder/KARTHIK JAVA/PYTHON/exp3.py
Python Programming
```

Python String split()

The split() method breaks down a string into a list of substrings using a chosen separator.
text = 'Python is fun' # split the text from space print(text.split())

Python String startswith()

The startswith() method returns True if a string starts with the specified prefix(string). If not, it returns False.
message = 'Python is fun'
# check if the message starts with Python
print(message.startswith('Python')) Output:

```
1  message = 'Python is fun'
2  # check if the message starts with Python
3  print(message.startswith('Python'))
4
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS
PS C:\Users\karth> & C:/Users/karth/AppData/Local/Pro
nts/New folder/KARTHIK JAVA/PYTHON/exp3.py"
True
```

Python String isnumeric()

The isnumeric() method checks if all the characters in the string are numeric.
pin = "523"
# checks if every character of pin is numeric

print(pin.isnumeric()) Output:

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```
1   pin = "523"
2   print(pin.isnumeric())
3

PROBLEMS    OUTPUT    DEBUG CONSOLE

PS C:\Users\karth> & C:/Users/karth
nts/New folder/KARTHIK JAVA/PYTHON/
True
```

Python String index()

The index() method returns the index of a substring inside the string (if found). If the substring is not found, it raises an exception. text = 'Python is fun' # find the index of is result = text.index('is') print(result) Output:

```
1   text = 'Python is fun'
2   result = text.index('is')
3   print(result)
4

PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMIN

PS C:\Users\karth> & C:/Users/karth/AppD
nts/New folder/KARTHIK JAVA/PYTHON/exp3.
7
```

Python String Formatting (f-Strings)

Python f-Strings makes it easy to print values and variables. For example,
name = 'Cathy' country = 'UK' print(f'{name} is from {country}')

Output:

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```
1  name = 'Cathy'
2  country = 'UK'
3  print(f'{name} is from {countr
4
```

PROBLEMS OUTPUT DEBUG CONSOLE TERM

```
PS C:\Users\karth> & C:/Users/karth/Ap
nts/New folder/KARTHIK JAVA/PYTHON/exp
Cathy is from UK
```

Python Raw String

Python strings become raw strings when they are prefixed with r or R, such as r'...' and R'...'. Raw strings treat backslashes () as literal characters. Raw strings are useful for strings with a lot of backslashes, like regular expressions or directory paths.

str = "This is a \n normal string example"
print(str) raw_str = r"This is a \n raw
string example" print(raw_str)

Output

```
1  str = "This is a \n normal string example"
2  print(str)
3  raw_str = r"This is a \n raw string example"
4  print(raw_str)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\karth> & C:/Users/karth/AppData/Local/Progra
nts/New folder/KARTHIK JAVA/PYTHON/exp3.py"
This is a
 normal string example
This is a \n raw string example
```

Post Lab Exercise:

a. Write a Python program to reverse a string.

```
1  def reverse_string(s):
2      return s[::-1]
3  string = input("Enter a string: ")
4  print("Reversed string:", reverse_string(string))
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\karth> & C:/Users/karth/AppData/Local/Programs/
nts/New folder/KARTHIK JAVA/PYTHON/exp3.py"
Enter a string: 56
```

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b. Write a Python program to check if a string is a palindrome.

```
1  def is_palindrome(s):
2      return s == s[::-1]
3  string = input("Enter a string: ").lower()
4  print("Is palindrome:", is_palindrome(string))
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\karth> & C:/Users/karth/AppData/Local/Programs/Py
nts/New folder/KARTHIK JAVA/PYTHON/exp3.py"
Enter a string: 5005
Is palindrome: True
```

c. Write a Python program to check if a string contains only digits.

```
1  def contains_only_digits(s):
2      return s.isdigit()
3  string = input("Enter a string: ")
4  print("Contains only digits:", contains_only_digits(string))
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\karth> & C:/Users/karth/AppData/Local/Programs/Python/Python313/py
nts/New folder/KARTHIK JAVA/PYTHON/exp3.py"
Enter a string: 52
```

d. Write a Python program to find the longest word in a sentence.

```
1  def longest_word(sentence):
2      words = sentence.split()
3      return max(words, key=len)
4  sentence = input("Enter a sentence: ")
5  print("Longest word:", longest_word(sentence))
```

e. Write a Python program to find the length of the last word in a sentence.

```
1  def last_word_length(sentence):
2      words = sentence.split()
3      return len(words[-1])
4  sentence = input("Enter a sentence: ")
5  print("Length of last word:", last_word_length(sentence))
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\karth> & C:/Users/karth/AppData/Local/Programs/Python/Pyth
nts/New folder/KARTHIK JAVA/PYTHON/exp3.py"
Enter a sentence: 564
Length of last word: 3
```