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Notebook 3

- in this notebook we discussed all about string in pyhton.
- it is very very helpful for Python programmers because of the maximum function implementing in this notebook.

Strings are sequence of Characters

in python specifically, strings are a sequence of unicode characters

- creating strings
- accessing strings
- adding chars to strings
- editing strings
- deleting strings
- operations on strings
- string functions

Creating Strings

```python
s='hello'
s="hello"
s='''hello''' #for multiline strings
print(s)

s=str("hello")

hello

"it's raining outside"

"it's raining outside"
```

accessing substrings from a string

```python
# indexing
s='hello world'
print(s[0])
```

```
print(s[-3])
print(s[-2])

h
r
l

# Slicing
s="muhammad danial"
print(s[0:8])

muhammad

print(s[-6:])

danial

print(s[:-7])

muhammad

print(s[9:16:2])

dna

print(s[16:8:-1])

lainad

s="hello world"
print(s[::-1])

dlrow olleh

s="hello world"
print(s[-1:-6:-1])

dlrow
```

Editing and Deleting in strings

- python strings are immutable

```
s="hello world"
s[0]='H'

-----------------------------------------------------------------
-----
TypeError                                 Traceback (most recent call
last)
~\AppData\Local\Temp/ipykernel_1492/465848929.py in <module>
      1 s="hello world"
----> 2 s[0]='H'
```

```
TypeError: 'str' object does not support item assignment

s="hello world"
print(s)

hello world
```

for deletion we used **del** keyword
- we can delete the whole string
- we can't delete the substring of string

```
del s

print(s)

---------------------------------------------------------------------
-----
NameError                                 Traceback (most recent call
last)
~\AppData\Local\Temp/ipykernel_1492/926740265.py in <module>
----> 1 print(s)

NameError: name 's' is not defined

s="hello world"
del s[-1:-5:2]
print(s)

---------------------------------------------------------------------
-----
TypeError                                 Traceback (most recent call
last)
~\AppData\Local\Temp/ipykernel_3216/3121032187.py in <module>
      1 s="hello world"
----> 2 del s[-1:-5:2]
      3 print(s)

TypeError: 'str' object does not support item deletion
```

Operations on Strings
- Arithmetic operations
- Relational operations
- logical operations
- loops on strings
- membership operators

```
print("Muhammad" +'/'+ "Danial")
```

```
Muhammad/Danial

print("muhammad"*5)

muhammadmuhammadmuhammadmuhammadmuhammad

print("*"*50)

**************************************************
```

Relational all operators are usedable

lexiographically

- Lexicographical order is nothing but the dictionary order or preferably the order in which words appear in the dictonary. For example, let's take three strings, "short", "shorthand" and "small". In the dictionary, "short" comes before "shorthand" and "shorthand" comes before "small". This is lexicographical order.

```
'Muhammad'=='muhammad'

False

'muhammad'>'Muhammad'

True

'Danial' > 'Muhammad'

False

'Danial' >'danial'

False
```

Logical operators

```
'hello' and 'world'

'world'

'hello' or 'world'

'hello'
```

- " "==> mean Falso or 0

```
"" and 'world'

''

'' or 'world'
```

```
'world'
```

```
not ''
```

```
True
```

```
not 'hello'
```

```
False
```

loops

```python
for i in 'danial':
    print(i)
```

```
d
a
n
i
a
l
```

```python
for i in 'pakistan':
    print("dani")
```

```
dani
dani
dani
dani
dani
dani
dani
dani
```

Membership operators

- in python we have 2 membership operators **in** and **not in**.

```python
'D' in 'Danial'
```

```
True
```

```python
'D' in 'danial'
```

```
False
```

```python
'D' not in 'danial'
```

```
True
```

Common Strings Functions

- len

- max

- min

- sorted

    This functions are used in all data types

```
len("danial")

6

max('Danial') # Ascii value base

'n'

min("Danial")

'D'

sorted("danial")

['a', 'a', 'd', 'i', 'l', 'n']

sorted('danial',reverse=True)

['n', 'l', 'i', 'd', 'a', 'a']
```

Capitalize/Title/Upper/Lower/Swapcase

These functions are only used on the strings.

```
s='muhammad danial'
s.capitalize()

'Muhammad danial'

s.title()

'Muhammad Danial'

s.upper()

'MUHAMMAD DANIAL'

s.lower()

'muhammad danial'

'DaNiAl'.swapcase() # capital to lower and vice versa
```

```
'dAnIaL'
```

Count/Find/Index

```
'my name is danial'.count('a')

3

'my name is danial'.find('is')

8
```

- if the character is not in the given string then the **find** method return **-1**

```
'my name is danial'.find('x')

-1
```

- if the given character is not in the string then the **index** method gives the error

```
'my name is danial'.index('is')

8

'my name is danial'.index('x')

---------------------------------------------------------------------
-----
ValueError                                Traceback (most recent call
last)
~\AppData\Local\Temp/ipykernel_1492/1048663343.py in <module>
----> 1 'my name is danial'.index('x')

ValueError: substring not found
```

endswith/startswith

```
'my name is muhammad danial'.endswith('al')

True

'my name is muhammad danial'.startswith('my')

True
```

format

```
name='danial'
gender='male'
'hi my name is {} and i am a {}'.format(name,gender)
```

```
'hi my name is danial and i am a male'

'hi my name is {1} and i am a {0}'.format(gender,name)

'hi my name is danial and i am a male'
```

f string

```
print(f"my name is {name} and i am a {gender}")

my name is danial and i am a male
```

isalnum/isalpha/isdigit/isidentifier

```
# check alphabetic and numeric
'danial786'.isalnum()

True

# check only alphabetic
'danial'.isalpha()

True

# check only numeric
'123'.isdigit()

True

# check the given string is identifier or not
'name1'.isidentifier()

True

'1name'.isidentifier()

False
```

Split/Join

```
'hi my name is muhammad danial'.split()

['hi', 'my', 'name', 'is', 'muhammad', 'danial']

'hi my name is muhammad danial'.split('a')

['hi my n', 'me is muh', 'mm', 'd d', 'ni', 'l']

" ".join(['hi', 'my', 'name', 'is', 'muhammad', 'danial'])

'hi my name is muhammad danial'
```

```
"-".join(['hi', 'my', 'name', 'is', 'muhammad', 'danial'])
```

```
'hi-my-name-is-muhammad-danial'
```

Replace

```
'hi my name is muhammad danial'.replace('danial','bilal')
```

```
'hi my name is muhammad bilal'
```

Strip

- remove spaces

```
'danial                    '.strip()
```

```
'danial'
```

Example programs

```python
# find the length of a given string without using the len() function

s=input("Enter the string")
counter=0
for i in s:
    counter+=1
print('The string is : ',s)
print('length of string is : ',counter)
```

```
The string is :  danial
length of string is :  6
```

```python
# Extract username from a given email
# bilal734@gmail.com
# bilal734
s=input("enter email")
pos=s.index('@')
print(s[0:pos])
```

```
bilal734
```

```python
# count the frequency of a particular character in a provided string.
# Eg 'hello how are you' is the string, the frequency of h in this
string is 2.

s=input("enter string")
term=input('what would like to search for')

counter=0
for i in s:
    if i==term:
```

```
        counter+=1
print('frequency',counter)

frequency 2

# write a program which can remove a particular character from a
string.
s=input("enter string")
term=input('what would like to delete for')
result=''
for i in s:
    if i!=term:
        result=result+i
print("your string is: ",s)
print('your desire character which you want to delete: ',term)
print(result)

your string is:  danial
your desire character which you want to delete:  a
dnil

# write a program that can check weather a given string is palindrome
or not.
# abba
# ana
# nan
s=input("enter string")
print("your string is: ",s)
flag=True
for i in range(0,len(s)//2):
    if s[i] != s[len(s)-i -1]:
        flag=False
        print('not a palindrome')
        break
    if flag:
        print('palindrome')

your string is:  dad
palindrome

# write a program to count the number of words in a string without
split()

s=input("Enter string")
L=[]
temp=''
for i in s:
    if i!=' ':
        temp=temp+i
    else:
        L.append(temp)
```

```
        temp=''
L.append(temp)
print(L)

['hi', 'how', 'are', 'you']

# write a program to convert a string to title case without using
title function.
s=input("Enter string")
L=[]
for i in s.split():
    L.append(i[0].upper() + i[1:].lower())
print("your given string is: ",s)
print(" ".join((L)))

your given string is:  hi how are you
Hi How Are You
```