Jawaharlal Nehru Technological University Hyderabad

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Creating own modules

Session 6 , 30 Sep 22

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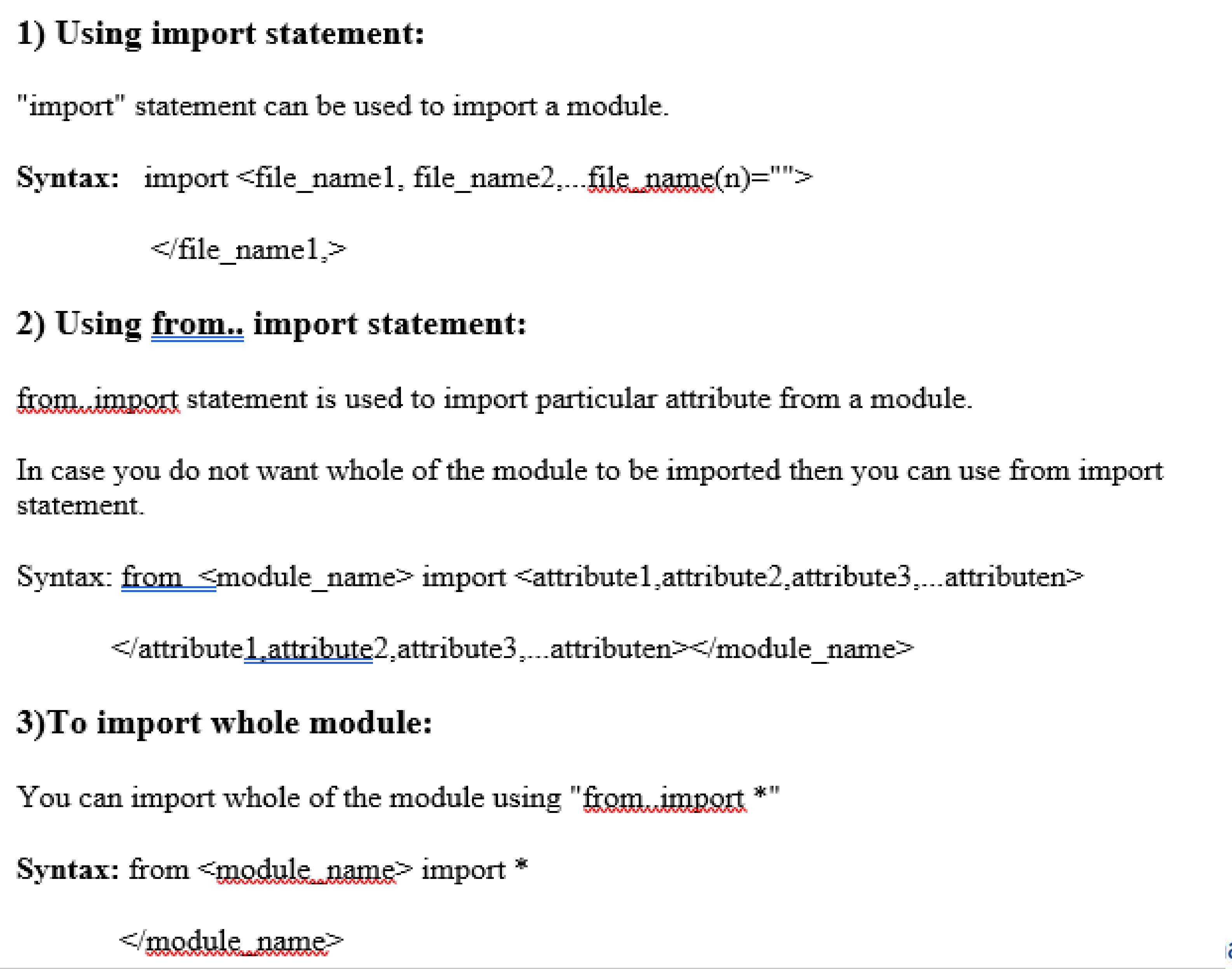
Custom Modules

- A module is simply a file, where classes, functions and variables are defined.
- Grouping similar code into a single file makes it easy to access.
- Consider a module to be the same as a code library.
- To create a module just save the code you want in a file with the file extension .py
- Now we can access module using the import statement

Kinds of import statements



1) Using import statement:

"import" statement can be used to import a module.

Syntax: import <file_name1, file_name2,...file_name(n)="">

</file_name1,>

2) Using from.. import statement:

from..import statement is used to import particular attribute from a module.

In case you do not want whole of the module to be imported then you can use from import statement.

Syntax: from <module_name> import <attribute1,attribute2,attribute3,...attributen>

</attribute1,attribute2,attribute3,...attributen></module_name>

3)To import whole module:

You can import whole of the module using "from..import *"

Syntax: from <module_name> import *

</module_name>

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Python Strings

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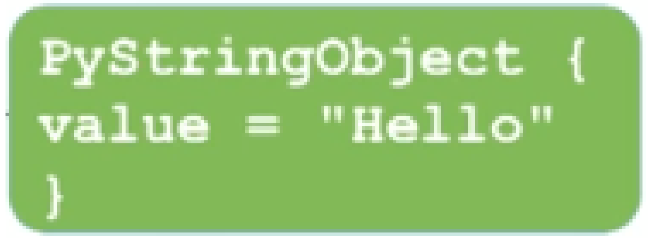
Strings

- String is a **group of characters** enclosed in single (‘) or double (")

value = “Hello”



```
PyStringObject {
value = "Hello"
}
```

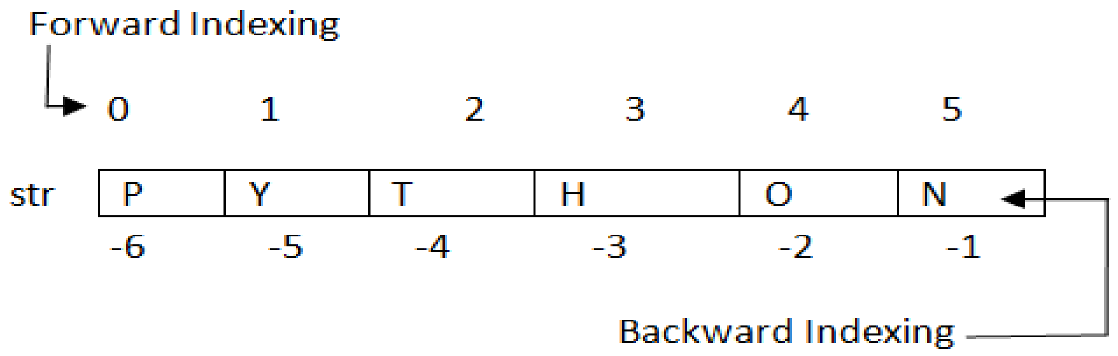
- String is a **sequence**, i.e. is *an ordered collection of values*

- Strings are **immutable,** i.e. We *cannot change an existing **string***

Accessing Strings

- Strings are stored as individual characters in a **contiguous memory location**
- Strings can be **accessed** from both the directions in **forward and backward** , one character at a time using [].

  The expression in brackets, known as **Index**



Forward Index: str[0]='P', str[1]=‘Y’ ….

Backward Index: str[-1]=‘N', str[-2]=‘O’ …

String – Immutable property

- Once the string is created, you can’t change an existing string. i.e. **immutable**,
- Example 1

```
str1="Python Programming“
str1[7] = ‘J’
ERROR: 'str' object does not support item assignment
```

- Example 2

```
str1 = "welcome"
id(str1)        # 2381521555888
str2 = "Welcome"
id(str2)        # 2381521446368
str2 += " python"
id(str2)        # 2381521558768
```

Concatenation and Replication operations

- **“+”** operator : Combines values on either side of the operator

- **“*”** operator : Concatenates multiple copies of a string to create new strings

  also known as **replication** Operator

  Example:

```
str1 = "Python "
str2 = "Programming"
print(str1+str2)
print(str1 *3)
```

Membership Operators on String

- "**in**" operator :

  return **true** if substring is present in the specified string , else **false**.

- "**not in**" operator:

  return **true** if substring does not exist in the specified string, else **false**.

Example:

```
str1="Python Programming"

"Program" in str1

"Program" not in str1
```

String Slicing

- Returns part of the string based on expression

Rules for Slicing notation:

1. [**n:m**] returns “nth” character to “mth” character,
2. [**:n**] slice starts at the beginning of the string.
3. [**n:**] slice goes to the end of the string
4. [:] returns total string
5. If the first index is **>=** to the second index, result is an **empty string**,

String Slicing examples

```
str1="Python Programming"

str1[0:6]

str1[7:18]

str1[:6]

str1[7:]

str1[:]

str1[5:3]
```

String Functions – len()

- len() : returns the number of characters in a string

  Ex:-

```
str1="Python Programming"
print (len(str1))
```

```
#calculate the length of a string

def string_length(str1):

   count = 0

   for char in str1:

      count += 1

   return count

print(string_length('python programming'))
```

String Traversal

- Processing string , one character at a time from starting character, select each character in turn, do something to it, and continue until the end, known as **traversal**.

Using While

```
str1="Python Programming"

len1 = len(str1)

index = 0

while (index < len1):

    letter = str1[index]

    print(letter)

    index = index + 1
```

Using for loop

```
str1="Python Programming"

for l in str1:

    print(l)
```

String count()

- **count()** returns the number of occurrences of substring sub in the range [start, end].

  - start and end are optional

```
str = "Python is an interpreted language"
str.count('i')


str.count('i', 7, 20)
```

Splitting strings

- **split()** : returns a list of all the words in the string, using str as the separator

```
str = "Python is an interpreted language"
str.split()
```

Note: split(str) where str is separator

if not specified, splits on all whitespace

```
str = "Python,is,an,interpreted,language"
str.split(',')
```

String join()

- join(iterable) : joins a list of strings using the object calling the string as the separator

  - **iterable** includes List, Tuple, String, Dictionary and Set

```
str1 = "Python is"
str2 = "a Programming language"
" ".join([str1,str2])
```

Searching for substring using find()

- **find**() method returns the **index of first occurrence** of the **substring**

  else returns **-1**

  syntax: integer find(sub[, start[, end]])

```
str = "Python is a programming language"
str.find('i’)

str.rfind('p',10,20)

str.rfind('i')
```

- **rfind**() method returns highest index

Searching for substring using index()

- index() : returns index of a substring.

  else raises an exception.

  index(sub[, start[, end]])

```
str = "Python is a programming language"
str.index('i’)

str.rindex('p',10,20)

str.index('z')
# raises exception
```

Check for char digit alphanumeric upper lower

- **isalpha**(): returns True if all characters in the string are alphabets, else returns False.
- **isdigit**() : returns True if all characters in a string are digits, else returns False.

function which accepts a sentence and finds the number of letters and digits in the sentence

```
s = input("Input a string")
d=l=0
for c in s:
    if c.isdigit():
        d=d+1
    elif c.isalpha():
        l=l+1
    else:
        pass
print("Letters", l)
print("Digits", d)
```

Similarly string has various functions

Islower()

Isupper()

Isalnum()

Replacing char/word

- replace(oldstr, newstr) :replaces a substring with an alternative string

```
str = "Python is an interpreted language"

str.replace('i','I')


str.replace("an",'a')
```

Removing spaces

- strip() : Remove spaces at the beginning and at the end of the string
- strip(*characters*) : Remove the leading and trailing characters

```
str="     welcome to python     "
print (str.lstrip())


str1="     welcome to python     "
print (str.lstrip(" "))
```

String processing using startwith() and endswith()

- **startswith**() : returns **True** if a string starts with the specified prefix(string), else **False**

  syn: startswith(prefix[, start[, end]])

- **endswith**() :returns **True** if a string ends with the specified suffix, else returns **False**.