6/4/21 1. **Iteration** : Its the process of repeating some tasks like in a loop.

a) **While Statement**

Syntax

```
while condition :
    S1
    S2
    :
    Sn
statements after while loop
```

First the condition is evaluated. The statements are executed till condition is true i.e in a loop

Once condition is false loop is terminated

⇒ iteration variable / counter variable changes its value for every execution / iteration and controls the execution of the loop

b) **Infinite loop : break and continue**

Break : This keyword is used to terminate the iteration of the loop even before the condition becomes false.

continue : This keyword is used to skip over the execution of few statements in a loop and execute the next statements

c) **For loop** : **This loop is used as the definite loop.**
definite loop ⇒ Used when we know exact number of loops required.

Syntax

```
for var in list/sequence:
    S1
    S2
    :
    Sn
Statements after the for loop
```

We can use range (start, end, steps) for a fixed set of numbers

start → is included; end → not included; steps → gap/difference between numbers.

d) **loop patterns**

loop are generally used to find max/min value in a list

- → Initialize 1 or more variables
- → Perform computations on each item in the body of the loop i.e changing variables
- → looking at resulting variable when this loop completes.

Counter Variable counts the number of items in a list.
Accumulator variable accumulates / sum the items in a list.

2. **Strings** : String is a sequence of characters enclosed within double quotes.

Strings are indexed starting with 0, negative indexing is also permitted.

X = "hello World"
0 1 2 3 4 5 6 7 8 9 10
-11 - - - - - - - - -2 -1

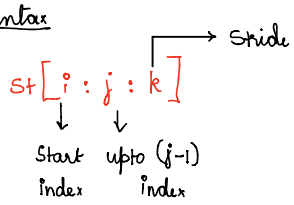
a) Transversal through String with a loop

Traversal: It's the process of extracting every character from the string one after the other & performing some action on it.

b) String Slices

Slicing is extracting a portion of the string

Syntax



stride is step increament and its default value is 1.

c) Strings are Immutable

Strings objects cannot be changed using assignment operator. We can slice the string using string slice and concatenate it using '+'

d) Looping and counting

Using loop on a string we can count the frequency of occurence of a character in the string.

e) in operator: It's a Boolean operator that takes 2 Strings an returns 'True' if 1st string appears in 2nd

f) String methods

String is a class, when we create string object is created that can access all the member variables and member methods/functions of the class.

class is a collection of member variables / functions. When an object of particular class is created it can access all of class's members.

↑
dot operator

syntax

ObjName . memberMethod (arguments)

⇓

dot

↓

dot binds the member name with object name to avoid confusion

g) Parsing Strings

Parsing is a process of finding a substring within a string matching a certain criteria.

3. Files

→ Files allows to store data permanently in secondary storage and read the data from this permanent source.

a) Persistence

The files stored in the secondary memory are permanent and can be transferred to other machines using pen drives / CD.

b) Opening files.

→ To perform any actions on the file, one must open the file.
→ File opening involves communication with the operating system.

syntax :

fhand = open("filename", "mode")

↓ pathname is required if file is not stored in current working directory.

↓ why we are opening? ex: read / write.

When program makes a request to open a specific file, OS will serve this request. When a file gets opened successfully, then a file object is returned.

error / traceback while opening a file

1. file doesn't exist
2. Doesn't exist in that path
3. no permission for the specified mode
4. corrupted mode.

To manage these situations, better to open the files using try - except

c) modes

r – read - default mode of open function
w - write
a - appending
r+ – reading & writing
w+ - reading, writing & creation if it doesn't exist
a+ - append, reading & writing
rb, wb, ab – same actions but in binary format.

4. Text files & lines

→ Only text is \n at end of line to identify each line & EOF (end of file) to indicate file end.

a) Reading Files

open() → fhand i.e file handle which is object reference to the file object pointing to the first character in the file.

→ a txt file containing lines can be iterated using for - loop.

→ new - line is detected using \n character.

syntax to close file

fhand.close()

b) Reading a file as a string

read() is used to read a small file as a string

5) Writing Files

→ 'w' mode is used

→ write() gives the character no as o/p after writing into the file.

→ '\n' to be specified as it's not explicitly in write()

6) Searching through a file

7) Using try - except block & letting the user choose the file name.

try - except → prevents runtime error

8) debugging

repr() : its a utility function that takes an object as an argument & returns a string representation of that object.