SCHOOL OF
INFORMATION TECHNOLOGY
AND INNOVATION
BANGKOK UNIVERSITY

Python
WHILE Loop

CS310 : Computer Programming I

ผศ.สิรินธร จียาศักดิ์

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python

While LOOP

Definition

Getting to know python while loop.

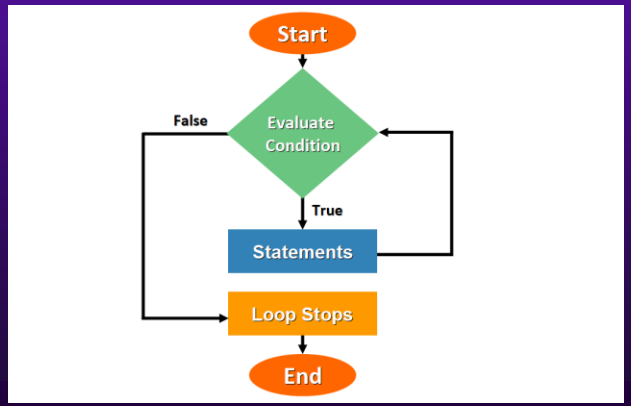
While Loop Definition

Definition

They are used to **repeat a sequence of statements an unknown number of times.** This type of loop runs **while** a given condition is True and it only stops when the condition becomes False.

When we write a while loop, we don't **explicitly define how many iterations will be completed,** we only write the condition that has to be True to continue the process and False to stop it.

Flowchart

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Python
While Loop
Python while loop syntax and how to a write program that execute repletely.

Python While Loop Statement

Indefinite Iteration

Using for unexpected loop or event control loop.

Definite Iteration

You can use python for loop and python while loop.

Comparison For loop and While loop

```
for x in range (Start, Stop, Step) :
    print("hello")
```

```
Start
while condition to loop(Stop) :
    print("hello")
    Step
```

Using while loop :
1. set start
2. set stop
3. set step

Manually.

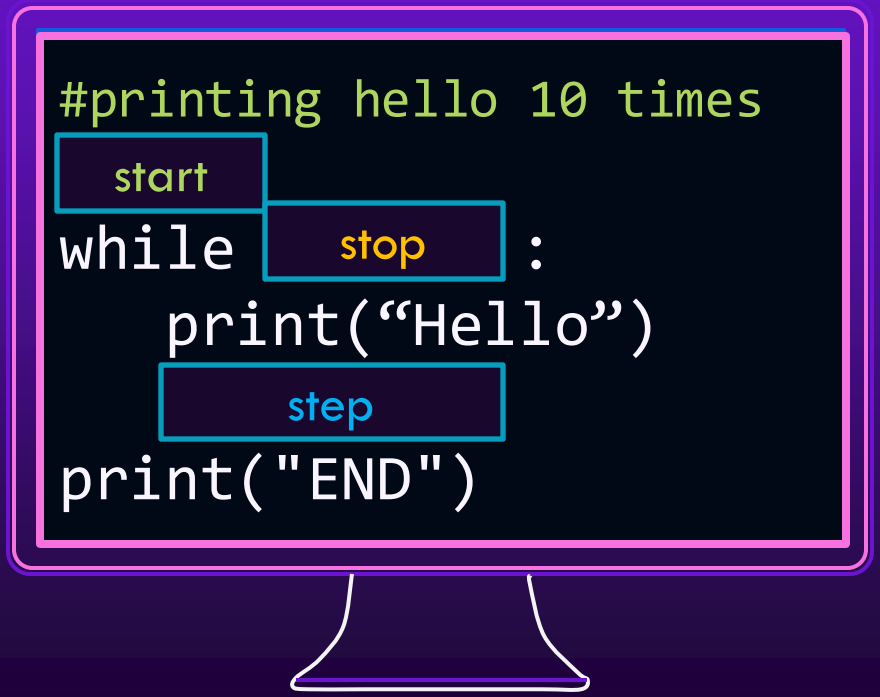
Python for loop using range function

This function yields a sequence of numbers. When called with one argument, say n, it creates a sequence of numbers from 0 to n-1.

SYNTAX:

```
control_var = 0 #Start
while control_var for evaluate :  #Stop
    statements
    control_var step for while loop
```

Definite Iteration using while loop




```
Hello.
Hello.
Hello.
Hello.
Hello.
Hello.
Hello.
Hello.
Hello.
Hello.
END
```

Definite Iteration using while loop

Ex.1 for

```
for n in range(6) :
    print(n)
```

Ex.1 while

```
n = 0
while n < 6:
    print(n)
    n = n + 1
```

```
0
1
2
3
4
5
```

Definite Iteration using while loop

Ex.2

```
for n in range(3,6) :
    print(n)
```

Ex.2

```
n = 3
while n < 6 :
    print(n)
    n = n + 1
```

```
3
4
5
```

Definite Iteration using while loop

Ex.3 for

```
for n in range(3, 15, 2) :
    print(n)
```

Ex.3 while

```
n = 3
while n < 15 :
    print(n)
    n = n + 2
```

```
3
5
7
9
11
13
```

Example of infinite loop

```
count = 0
while (count < 9):
    print('The count is:', count)
    count = count + 1
```

```
count = 0
while (count < 9):
    print('The count is:', count)
```

Infinite Loop

```
count = 0
while (count < 9):
    print('The count is:', count)
    count = count - 1
```

Infinite Loop

Example of indefinite iteration using while

```
working = "1"
while working == "1" :
    num = input("Enter a number : ")
    print ("You entered: ", num)
    working = input("Do you want to (1=working):")
```

Result

```
Enter a number : 10
You entered:  10
Do you want to (1=working):1
Enter a number : 15
You entered:  15
Do you want to (1=working):0
```

Example of indefinite iteration using while

Example : print “Hello” in case of a number is positive and stop when a number is negative number.

```
num = int(input("Enter a number : "))
while num>0 :
  print("Hello")
  num = int(input("Enter a number : "))
print(”\nProgram closed.")
```

```
Enter number : 13
Hello
Enter number : 7
Hello
Enter number : 23
Hello
Enter number : -1

Program closed.
```

Example of indefinite iteration using while

Example : Calculate the average all of the positive number and stop when an input number is negative

```
num = int(input("Enter a number : "))
sum,cnt = 0,0
while num > -1 :
  sum = sum + num
  cnt = cnt + 1
  num = int(input("Enter a number : "))
print("SUM = ",sum)
print("AVG = %0.2f"%(sum/cnt))
print("Program closed.")
```

```
Enter number : 13
Enter number : 7
Enter number : 23
Enter number : -1

Sum of number : 43
Average of number : 14.33
```

Example of indefinite iteration using while

Example : count digits of a number

```
number = int(input("Enter a number : "))
digit = 0
while number > 0 :
    digit = digit + 1
    number = number//10
print("Digits of the number = ",digit)
```

Output

```
Enter a number : 123456
Digits amount = 6
```

Example of indefinite iteration using while

```
number = input("Enter a number: ")
if number.isnumeric() :
   number = int(number)
   digit = 0
   while number > 0 :
      digit = digit + 1
      number = number//10
      print(number)
      print("Digits of the number = ",digit)
else:
    print("Error. Please enter only numeric.")
```

Output

```
Enter a number : 123456
Digits amount = 6
```

Example of indefinite iteration using while

Example : Calculate the average all of the positive number and stop when an input number is negative

```
number = input("Enter a number: ")
while number.isnumeric() == False :
  print("Error.")
  number = input("Enter a number: ")

number = int(number)
digit = 0
while number > 0 :
  digit = digit + 1
  number = number//10
  print(number)
print("Digits of the number = ",digit)
```

Example of indefinite iteration using while

Example : use while loop to count vowel of any alphabet

```
vowels = ['A','E','I','O','U']
status = "Y"
cnt = 0
while status ==  "Y" :
    char = input("Enter alphabet(A-Z) : ").upper()
    if char >= 'A' and char <= 'Z' :
        if char in vowels :
            cnt = cnt + 1
    status = input("Do you want to continue
(y=yes/n=no) : ").upper()
print("Vowel amount of A-Z = ",cnt)
```

Class Activity

while loop

Class Activity

จงเขียนโปรแกรมที่ทำหน้าที่รับตัวเลขเข้ามาจากแป้นพิมพ์ เพื่อหาจำนวน**เลขคู่ และเลขคี่** ว่ามีอย่างละกี่จำนวน จบการทำงานเมื่อมีการรับค่ามาเป็นเลข 0

```
Enter Number : 20                    # ข้อมูลตัวที่ 1
Enter Number : 18                    # ข้อมูลตัวที่ 2
Enter Number : 35                    # ข้อมูลตัวที่ 3
Enter Number : 34                    # ข้อมูลตัวที่ 4
Enter Number : 0          # ข้อมูลตัวที่ 5

Total even number = 3
Total odd number = 1
```

While Loop

Python List

How to append list using while loop

Example: Input 5 numbers using while loop and then append each number into a list

1. Declare variable list type name is Number
2. Using for loop to repeat 5 times
3. Using input statement to get input data from keyboard
4. Append the input data into the list
5. Display the list

How to append list using while loop

Example: Input 5 numbers using while loop and then append each number into a list

```
number = []
x = 1
while x <= 5 :
   num = int(input("Enter number : "))
   number.append(num)
   x = x + 1
print("List = ",Number)
```

How to append list using while loop

Example: Input N amounts of number using for loop and then append each number into a list

1. Declare variable list type name is Number
2. Input amount of number (N times) do you want
3. Using for loop to repeat amount(N) times
4. Using input statement to get input data from keyboard
5. Append the input data into the list
6. Display the list

How to append list using while loop

Example: Append number into the number list using while loop

```
number = []
n = int(input("Enter total amount of numbers : "))
i = 0
while i < n :
    num = int(input("Enter a number : "))
    number.append(num)
    i = i + 1
print(number)
```

How to append list using while loop

Example: Access data of the Number list (in before example)

```
x = 0
while x < n :
   print("Data = ",number[x])
   x = x + 1
```

Class Activity

while loop

Eatery Program

Expected Output

List Menu Price :
H = 90
P = 185
W = 20

```
Menu : H = Hamburger, P = Pizza, W = Water, E = Exit
Enter menu (H,P,W,E=exit) : H
Enter amount : 2

Menu : H = Hamburger, P = Pizza, W = Water, E = Exit
Enter menu (H,P,W,E=exit) : p
Enter amount : 3

Menu : H = Hamburger, P = Pizza, W = Water, E = Exit
Enter menu (H,P,W,E=exit) : E
------------------------------------------------
Total price = 735.00   baths
Discount    = 73.50    baths
Net price   = 661.50   baths
------------------------------------------------
```

Homework of Week7

Write a program that repletely prompt using while loop

LAB7 – ITI Restaurant Program

```
--------------------------------------------------
                      Menu
--------------------------------------------------
  ID                Menu                   Price
  F01          Tuna Tartare Salsa           125
  F02          Cordon Bleu Chicken          145
  F03          Salmon Steak with Sauce      169
  F04          Caesar Salad                 139
  D01          Sparkling Sunset              90
  D02          Coke Mojito                   60
--------------------------------------------------
Menu ID: F01
Amount : 3
Next order(Y/N): N
--------------------------------------------------
ITI Member Card (Y/N): N
--------------------------------------------------
                    Receipt
--------------------------------------------------
     Menu                  QTY          Total Price
 Tuna Tartare Salsa         3              375
--------------------------------------------------
Total Amount                                375.00
Tax(7%)                                      26.25
Discount(10%)                                 0.00
Net Total                                   401.25
--------------------------------------------------
```

Count digit all of number in a list

```
numlist = [111,22,33333,444444,5555555,6666666]
```

Expected Output

```
111 = 3 Digits
22 = 2 Digits
33333 = 5 Digits
444444 = 6 Digits
5555555 = 7 Digits
6666666 = 7 Digits
```

Nested Loop

examples

Multiplication Table Example

```
mae_start = int(input("Enter a start of multiplication table: "))
mae_stop = int(input("Enter a stop of multiplication table : "))
for m in range(mae_start,mae_stop+1) :
    for n in range(1,13) :
        ans = m*n
        print("%4d x %2d =%4d"%(m,n,ans))
    print("="*50)
```

Test and Run this program

Thank you

Any question?
contact me at Sirinthorn.c@bu.ac.th
or MS Team