

python Workshop

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Loops

Why Loops ?

A loop statement allows us to execute a statement or group of statements **multiple** times.

while loop

Two must condition:

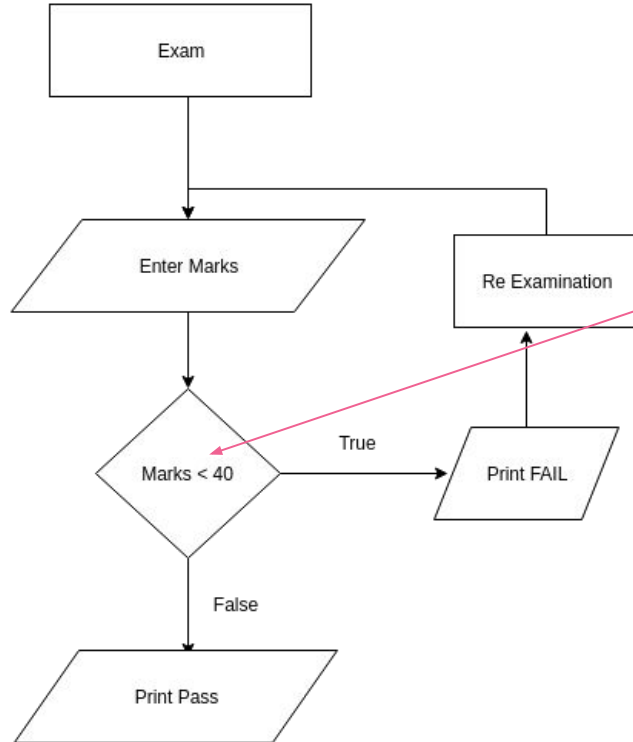
1. Once conditional statement
2. Value of the at least one of the variable should change and it must be used in conditional query

Otherwise

INFINITE LOOP

Note: Even if above two statements are followed the program may goto infinite loop.

Re Examination



```
marks = raw_input("Enter marks : ")
marks = int(marks)
while(marks<40):
    print "FAIL";
    marks = raw_input("Enter marks : ")
    marks = int(marks)
print "Pass"
```

Countdown

```
number = raw_input("Enter number : ")
number = int(number)
while(number!=0):
    print number
    number-=1
print "Completed"
```

```
Enter number : 7
7
6
5
4
3
2
1
Completed
```

Infinite Loop

```
number = raw_input("Enter number : ")
number = int(number)
while(number!=0):
    print number
    number+=1
print "Completed"
```

```
Enter number : 10
10
11
12
13
14
15
16
17
18
19
20
..
..
```

Infinite Loop :(What to do now ?

To come out of infinite loop press

ctrl + C

In Linux/UNIX system

Loops

There is no
do..while()
loop in python.

Loops

There is no
`for(i=0; i<n; i++) {.....}`
loop in python.

Loops

We have something more interesting and something that makes more sense

Yes..

We call it for loop only.

Before learning that. Let's learn

LIST

first



LIST

Just Basic

List

What is
LIST
?

List

List is a collection.

List helps us to put many things in a single variable.

Array ? List ?

List is **similar** to Array in C language but had lot many features compared to Array

My Friends

My Friends

Tarun

Raksha

Pranav

Shrenik

Srinivas

I want to store my friends name in a list ?

Can you do it using Array in C ? Yes? or its little bit lengthy ?

Its super super easy in python.

List - Just a single line of code

```
>>> myFriends = ['Tarun', 'Raksha', 'Pranav', 'Shrenik', 'Srinivas']
```

Yes that's all.

We have our list ready.

List

```
>>> myFriends = ['Tarun', 'Raksha', 'Pranav', 'Shrenik', 'Srinivas']  
>>> type(myFriends)  
<type 'list'>
```

You can directly access a particular value by entering the index value.

```
>>> print myFriends[0]  
Tarun  
>>> print myFriends[1]  
Raksha
```

len()

*You can count the number of elements in the list by using **len** function.*

```
>>> print len(myFriends)
```

```
5
```

range() function

What if you need to generate a list of numbers like 0,1,2,3,4,5,6,7,8,9,10

Or may be 0,2,4,6,8,10

But why you need it?

Trust me.. You will need it..

Let's see the range function in python.

range() function

```
>>> numbers = range(10)
>>> print numbers
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
>>> numbers = range(1,10)
>>> print numbers
[1, 2, 3, 4, 5, 6, 7, 8, 9]
>>> numbers = range(1,10,2)
>>> print numbers
[1, 3, 5, 7, 9]
```

`range(10)` It will generate numbers from 0 to 9 (Remember 10 is excluded)

`range(1,10)` It will generate numbers from 1 to 9

`range(1,10,2)` It will generate numbers from 1 to 9 with a difference of 2 between numbers

List

*So let's go back to Loops. We will study **LIST** again in detail in further modules.*

Back to Loops

for loop - syntax

SYNTAX

```
for iterating_var in sequence:  
    statements(s)
```

CONFUSING ??

Okay, let's see an example and try to understand it.

List

Problem:

I have list of my friends. I want to print Hello and then friend name for each friend in separate line.

Example

Hello Tarun

Hello Raksha

Hello Pranav

...

List

```
myFriends = ['Raksha','Tarun','Pranav','Shrenik']
```

```
for friend in myFriends:  
    print "Hello " + friend
```

OUTPUT

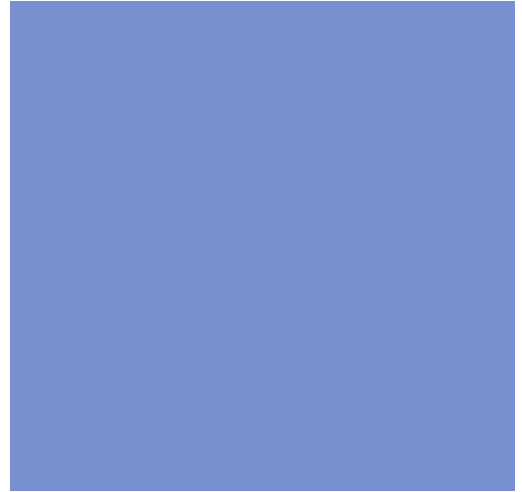
```
Hello Raksha  
Hello Tarun  
Hello Pranav  
Hello Shrenik
```

Execution - Step by Step

```
myFriends = ['Raksha','Tarun','Pranav','Shrenik']
```

```
for friend in myFriends:  
    print "Hello " + friend
```

OUTPUT



MEMORY



Execution - Step by Step

OUTPUT

```
myFriends = ['Raksha', 'Tarun', 'Pranav', 'Shrenik']
```

```
for friend in myFriends:  
    print "Hello " + friend
```

MEMORY

myFriends	List	['Raksha', 'Tarun', 'Pranav', 'Shrenik']
-----------	------	--

Execution - Step by Step

OUTPUT

```
myFriends = ['Raksha', 'Tarun', 'Pranav', 'Shrenik']
```

```
for friend in myFriends:  
    print "Hello " + friend
```

MEMORY

myFriends	List	['Raksha', 'Tarun', 'Pranav', 'Shrenik']
friend	String	'Raksha'

Execution - Step by Step

```
myFriends = ['Raksha', 'Tarun', 'Pranav', 'Shrenik']
```

```
for friend in myFriends:  
    print "Hello " + friend
```

OUTPUT

```
Hello Raksha
```

MEMORY

myFriends	List	['Raksha', 'Tarun', 'Pranav', 'Shrenik']
friend	String	'Raksha'

Execution - Step by Step

```
myFriends = ['Raksha', 'Tarun', 'Pranav', 'Shrenik']
```

```
for friend in myFriends:  
    print "Hello " + friend
```

OUTPUT

```
Hello Raksha
```

MEMORY

myFriends	List	['Raksha', 'Tarun', 'Pranav', 'Shrenik']
friend	String	'Tarun'

Execution - Step by Step

```
myFriends = ['Raksha', 'Tarun', 'Pranav', 'Shrenik']
```

```
for friend in myFriends:  
    print "Hello " + friend
```

OUTPUT

```
Hello Raksha  
Hello Tarun
```

MEMORY

myFriends	List	['Raksha', 'Tarun', 'Pranav', 'Shrenik']
friend	String	'Tarun'

Execution - Step by Step

```
myFriends = ['Raksha', 'Tarun', 'Pranav', 'Shrenik']
```

```
for friend in myFriends:  
    print "Hello " + friend
```

OUTPUT

```
Hello Raksha
```

```
Hello Tarun
```

MEMORY

myFriends	List	['Raksha', 'Tarun', 'Pranav', 'Shrenik']
friend	String	'Pranav'

Execution - Step by Step

```
myFriends = ['Raksha', 'Tarun', 'Pranav', 'Shrenik']
```

```
for friend in myFriends:  
    print "Hello " + friend
```

OUTPUT

```
Hello Raksha  
Hello Tarun  
Hello Pranav
```

MEMORY

myFriends	List	['Raksha', 'Tarun', 'Pranav', 'Shrenik']
friend	String	'Pranav'

Execution - Step by Step

```
myFriends = ['Raksha', 'Tarun', 'Pranav', 'Shrenik']
```

```
for friend in myFriends:  
    print "Hello " + friend
```

OUTPUT

```
Hello Raksha  
Hello Tarun  
Hello Pranav
```

MEMORY

myFriends	List	['Raksha', 'Tarun', 'Pranav', 'Shrenik']
friend	String	'Shrenik'

Execution - Step by Step

```
myFriends = ['Raksha', 'Tarun', 'Pranav', 'Shrenik']
```

```
for friend in myFriends:  
    print "Hello " + friend
```

OUTPUT

```
Hello Raksha  
Hello Tarun  
Hello Pranav  
Hello Shrenik
```

MEMORY

myFriends	List	['Raksha', 'Tarun', 'Pranav', 'Shrenik']
friend	String	'Shrenik'

for loop and range()

Problem:

Print the multiplication table of given number.

Example

Enter number : 5

5 x 1 = 5

5 x 2 = 10

....

....

5 x 10 = 50

for loop and range()

Now you need a list of numbers from 1 to 10

Let's use range function ()

List

```
number = raw_input("Enter a number : ")  
number = int(number)
```

```
for i in range(10):  
    print str(number) + " x " + str(i + 1) + " = " + str(number * (i + 1))
```

Assignment 3

Write a program to keep accepting numbers from user until he enters -1 and then print the sum, max, min and average of the numbers.

Write a program to accept a number from user and check weather it is prime or not. If it is not prime show its factors.

Thank You

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Assignments & Presentations:

<https://github.com/rahulcomp24/Python-Workshop-CS-Dept-BMSCE-May-2016>

