Experiment 2 – Python Decision Control Statements

Aim:

To get acquainted with decision control statements in Python programming.

Theory

if statement syntax

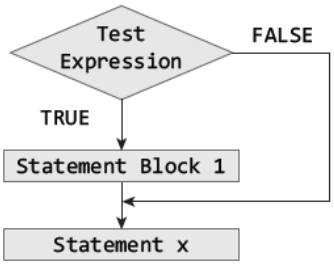
if *test_expression*:

statement 1

……

statement n

statement x



if-else statement syntax

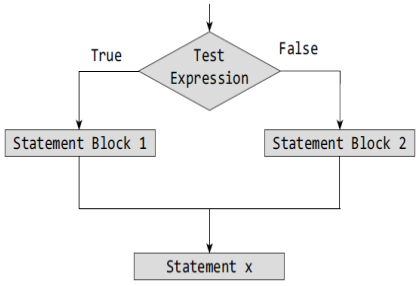
if *test_expression*:

statement block 1

else

statement block 2

statement x



While statement syntax

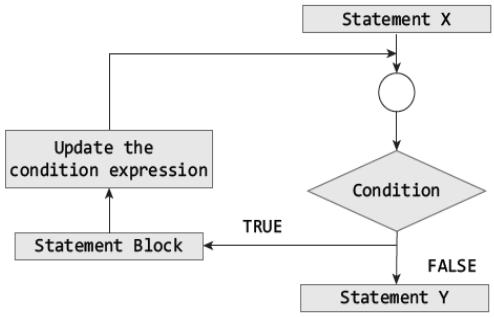
statement x

while condition:

  statement block

  update condition expression

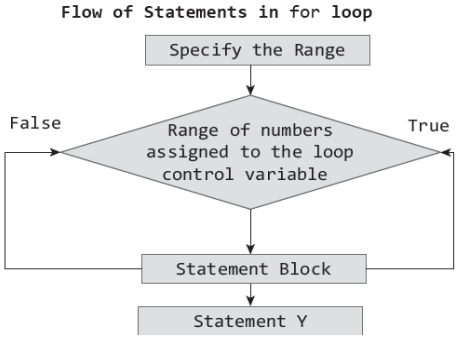
statement block Y



for loop_var in sequence:

  statement block

statement block Y

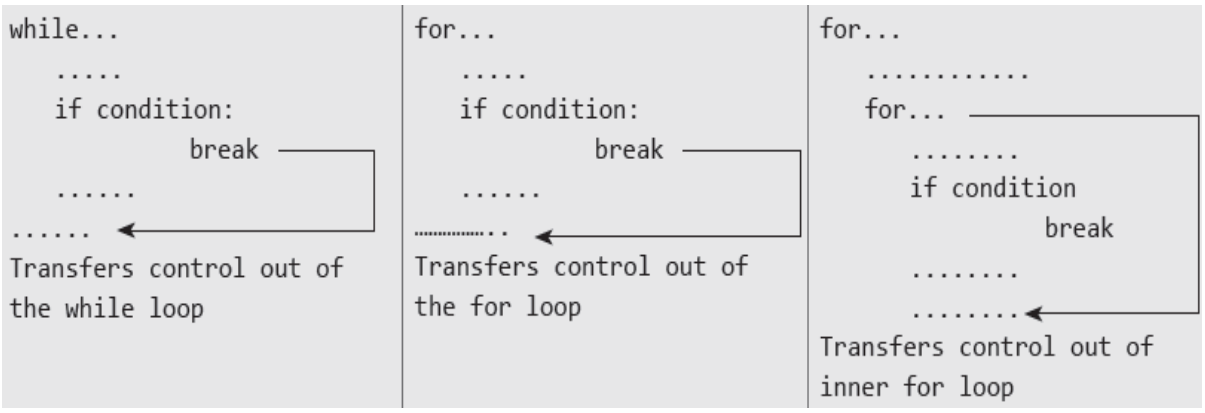


The range() function is a built-in function in Python that is used to iterate over a sequence of numbers. The syntax of range() is range(beg, end, [step])

for i in range(1,5):
  print(i, end= " ")
output
1 2 3 4
	for i in range(1,10,2):
	  print(i, end= " ")
	output
	1 3 5 7 9

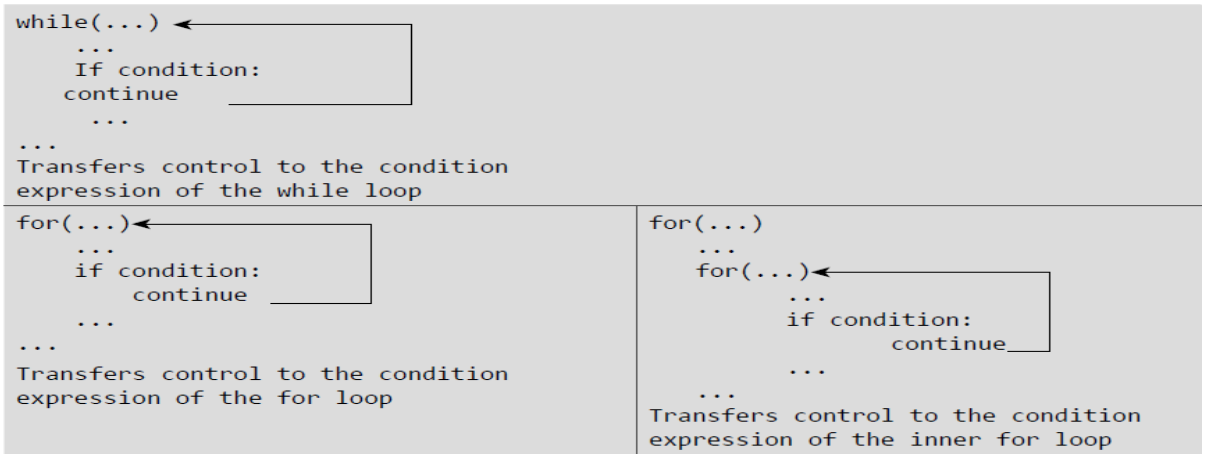
Break statement

To terminate the execution of the nearest enclosing loop in which it appears



Continue statement

When the compiler encounters a continue statement then the rest of the statements in the loop are skipped and the control is unconditionally transferred to the loop-continuation portion of the nearest enclosing loop.



PROGRAM 1: (2 marks)

Task 1

A)Always write the comments, with your details and program tasks .

```
#Author:CH.EN.U4CSE19036
#Objective:To print X with required value
#Input:Default value given in the program
#Output:X is printed
```

B) Run the program for x = -10. Rewrite the program so that x is printed. (2 marks) (*Include the 2-3 new commands only*)

PROGRAM:

```
x=-10
if (x>0):
   print(x)
else:
   print(x)
```

OUTPUT:

```
-10
```

RESULT AND INFERENCE:

The program has been successfully executed and Learnt how to print a value both if it is positive or negative.

PROGRAM 2: (6marks)

Task 2:

A) Always write the comments, with your details and program tasks

```
#Author: CH.EN.U4CSE19036
#Objective: To calculate the Grade from the given mark
#Input: User input
#Output: Display grade.
```

OUTPUT:

```
Enter the marks : 90
Grade =  O
```

B) Calculate the roots of a quadratic equation.

```
import math

a = int(input(" Enter the coefficient of x2  : "))
b = int(input(" Enter the coefficient of x   : "))
c = int(input(" Enter the value of c   : "))

d = (b * b) - (4 * a * c)

if(a==0):
        print("It is not a Quadratic equation")

elif(d > 0):
   root1 = (-b + math.sqrt(d) / (2 * a))
   root2 = (-b - math.sqrt(d) / (2 * a))
   print("Two Distinct Real Roots : root1 = %f and root2 = %f "(root1, root2))
elif(d == 0):
   root1 = root2 = -b / (2 * a)
   print("Two Equal and Real Roots : root1 = %f and root2 = %f" %(root1, root2))
elif(d < 0):
   root1 = root2 = -b / (2 * a)
   imaginary = math.sqrt(-d) / (2 * a)
   print("Two Distinct Complex Roots : root1 = %.2f+%.2f and root2 = %.2f-
%.2f" %(root1, imaginary, root2, imaginary))
```

OUTPUT:

```
Enter the coefficient of x2: 0
Enter the coefficient of x  : 1
Enter the value of c: 2
It is not a Quadratic equation
```

RESULT AND INFERENCE:

The program executed successfully and understood how to calculate the grades of a student and also to calculate the quadratic equation using python.

Program 3 (3 marks)

Task 3

A. Always write the comments, with your details and program tasks (1 mark)

```
#Author: CH.EN.U4CSE19036
#Objective: To find the sum of the digits of the given number
#Input: User input
#Output: Display the sum of the digits of the number
```

OUTPUT:

Enter the number: 111

The sum of the digit is: 3

B. Find GCD of two given numbers (using while loop) (6 marks)

```
a = float(input(" Enter the number a: "))
b = float(input("Enter the  number b: "))
i = 1
while(i <= a and i <= b):
    if(a % i == 0 and b % i == 0):
        gcd = i
    i = i + 1

print("\n The GCD Of +str(a)+ and+str(b)+ is  " +str(gcd))
```

OUTPUT:

```
Enter the number a: 4
Enter the number b: 2
The GCD of 4 and 2 is 2
```

RESULT AND INFERENCE:

The program has been successfully executed and learnt to calculate the gcd of two numbers.

Task 4

Program 4 (5marks)

A)Generate calendar of a month given the start_day and number of days in that month

```
#Author: CH.EN.U4CSE19036
#Objective: To Generate calendar of a month given the start_day and number of days .
#Input: User input
#Output: Display Calender with given inputs.

start = int(input("Enter the start day of month (1-7) : "))
num_days = int(input("Enter number of days : "))
print("Sun Mon Tue Wed Thu Fri Sat")
print("-----------------------------------------")
for I in range(start-1):
print(end=" ")
i = start-1
for j in range(1,num_days+1):
if i>7:
print(" ")
i = 1;
else: i = i+1
print(str(j)+" ",end = "")
print("\n-----------------------------------------\n")
```

```
Enter the start day of month (1-7) : 2
Enter number of days : 31
Sun  Mon  Tue  Wed  Thu  Fri  Sat
-----------------------------------------
      1    2    3    4    5    6
7    8    9   10   11   12   13
14   15   16   17   18   19   20
21   22   23   24   25   26   27
28   29   30   31
```

B)

OUTPUT:

```
#Author: CH.EN.U4CSE19036

#Objective: Execute the else part in the loops

#Inputs: User input.

#Outputs: Display the else part of the loop

for letter in "HELLO":
 print(letter,end = " ")
else:
 print("Done")
 print("\n-----------------------------------------\n")
 i = 1
 while(i<0):
print(i)
 i = i - 1
else:
 print(i,"is not negative. So loop did not execute")
```

```
H E L L O Done
1 is not negative. So loop did not execute
```

RESULT AND INFERENCE:

Thus the program has been successfully executed and learnt how to calculate the calendar and also how to print negative numbers.

Task 5

Calculate square root of a number. Demonstrate use of import, break and continue statements

```
#Author: CH.EN.U4CSE19036
#Objective: To import math module and to execute sqrt function in it
#Inputs: From the user
#Outputs: Display the square root of the numbers provided

import math

while(1):
    num = int(input("Enter a number"))
    if(num==999):
        break
    elif num<0:
```

```
        print("Square root of Negatve number")
        continue
    else:
        print("Square root of an number is+str(math.sqrt(num)))
```

OUTPUT:

```
Enter a number 3
Square root of  3  =  1.7320508075688772
Enter a number 4
Square root of  4  =  2.0
Enter a number 5
Square root of  5  =  2.23606797749979
Enter a number 64
Square root of  64  =  8.0
Enter a number 999
```

INFERENCE:

Learnt how to calculate the square root of a number using python.

Task 6

Compute the Least Common Multiple of two number:

OUTPUT:

RESULT AND INFERENCE:

The program has been successfully executed and learnt to compute the Least Common Multiple of two numbers.

```
a=input("Enter the value of a:")
b=input("Enter the value of b:")
if a<b:
   temp=a
   a=b
   b=temp
if a%b==0:
   print("LCM OF TWO NUMBERS IS",a)
else:
   i=a+1
   while True:
      if i%a==0 & i%b==0:
         lcm=i
         break
      i+=1
   print("Least common multiple of",lcm)
```

OUTPUT:

Enter the value of a:1

Enter the value of b:2

LCM OF TWO NUMBERS IS:2

Prepared by:

Name:	SANJAI SIDDHARTHAN M
Reg. No.:	CH.EN.U4CSE19036
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Marks Obtained (50)	