SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
DEGREE
VIDISHA M.P.
योगः कर्मसु कौशलम्

Future Skills Training Program

Data Science and Analytics

Topic:- Basics of Python

futureskills®
A NASSCOM initiative

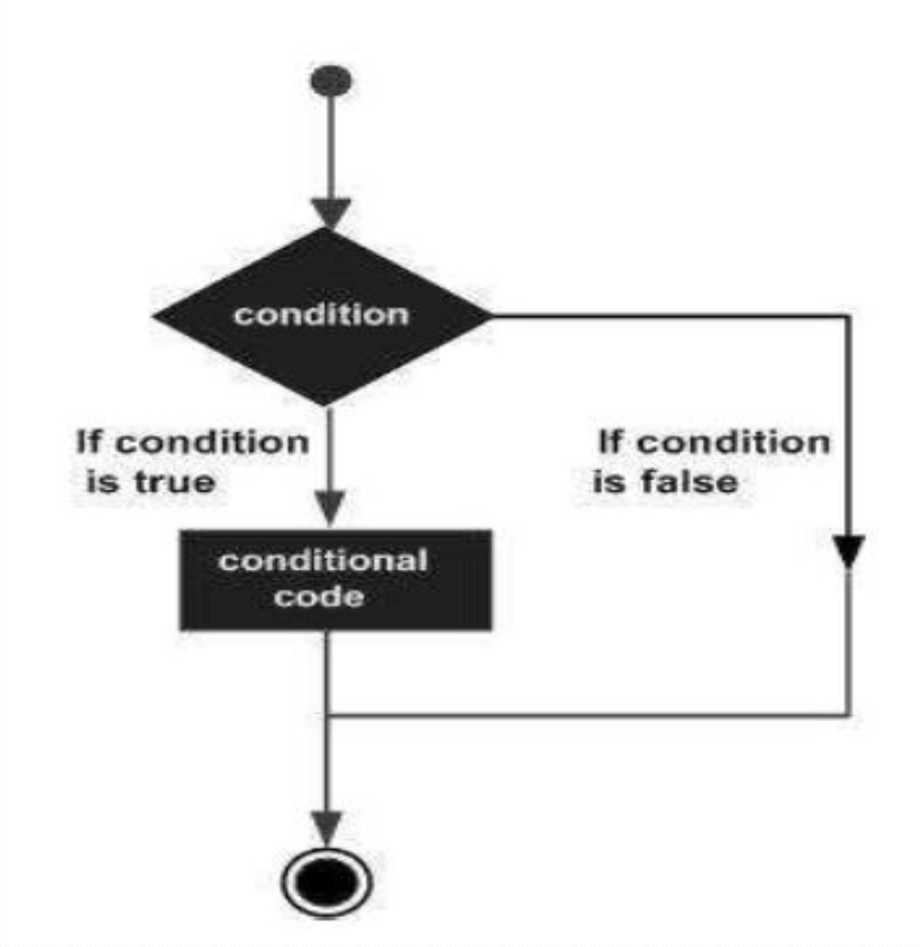
Dr. Sunil Joshi

Agenda

Python Basic

- Decision Statement
- Loops
- Number
- String

Decision Making

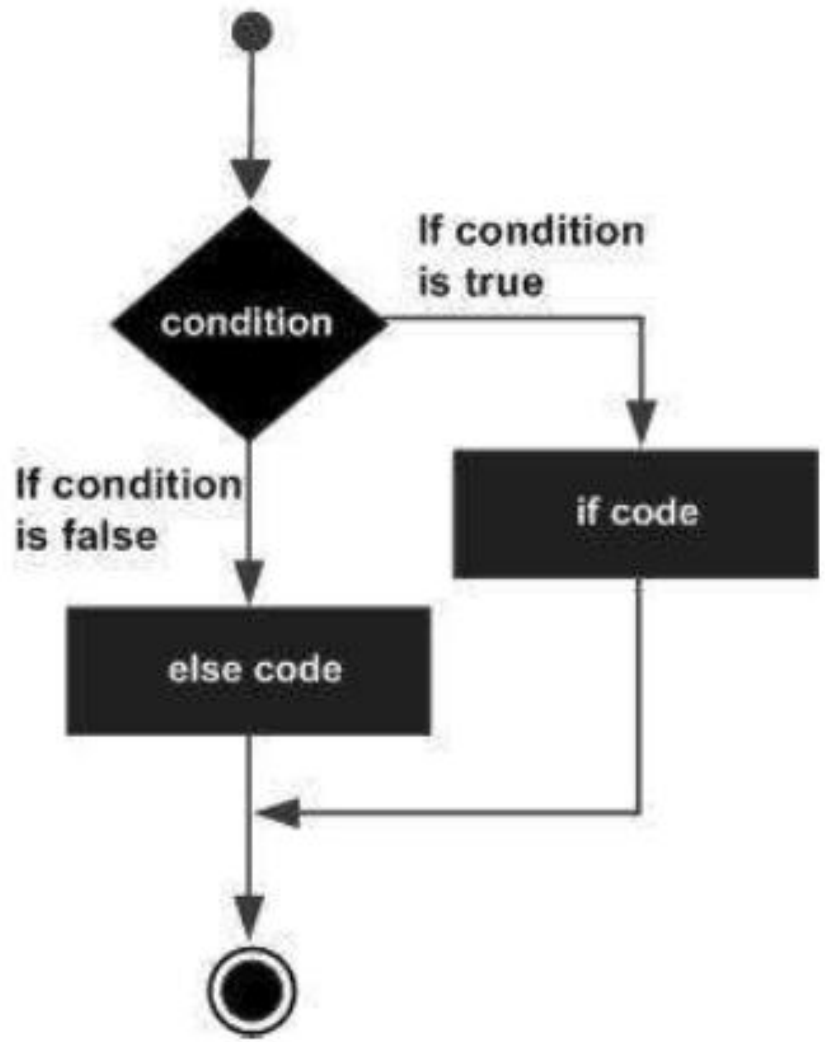


IF Statement

- **Simple If Statement**

```
if expression:
        statement(s)
```

IF Else Statement



IF Else Statement

- **Simple If Statement**

```
if expression:
        statement(s)
else:
        statement(s)
```

Example

- Write a Program in Python where discount is calculated on the input amount. Rate of discount is 5%, if the amount is less than 1000, and 10% if it is above 10000.

```
amount=int(input("Enter amount: "))
if amount<1000:
    discount=amount*0.05
    print ("Discount",discount)
else:
    discount=amount*0.10
    print ("Discount", discount)
print ("Net payable:",amount-discount)
```

```
Enter amount: 500
Discount 25.0 Net
payable: 475.0
```

The elif Statement

- **Simple If Statement**

```
 if expression1:
           statement(s)
elif expression2:
           statement(s)
elif expression3:
           statement(s)
else:
           statement(s)
```

Nested IF Statements

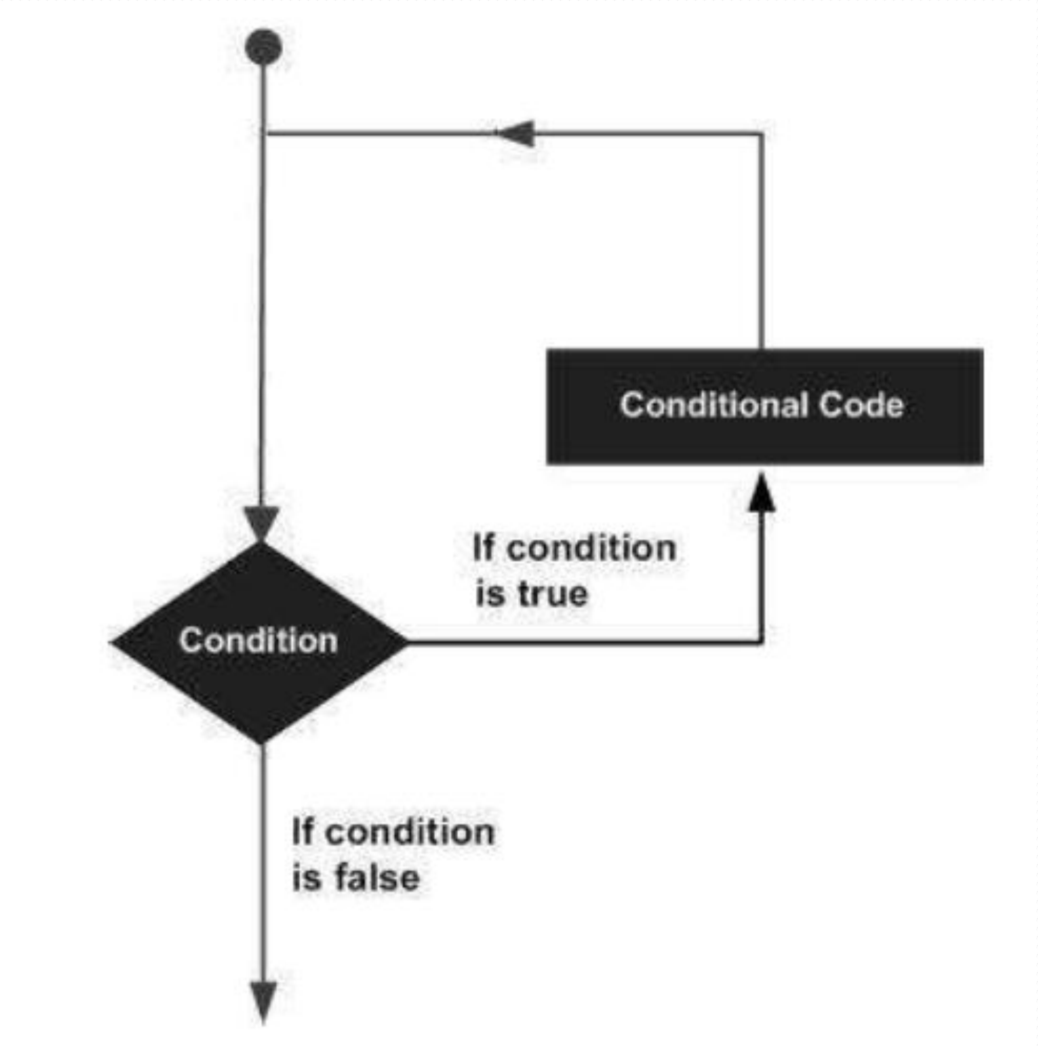
- **Nested If Statement**

```
if expression1:
    statement(s)
    if expression2:
        statement(s)
    elif expression3:
        statement(s)
    else
        statement(s)
elif expression4:
    statement(s)
else:
    statement(s)
```

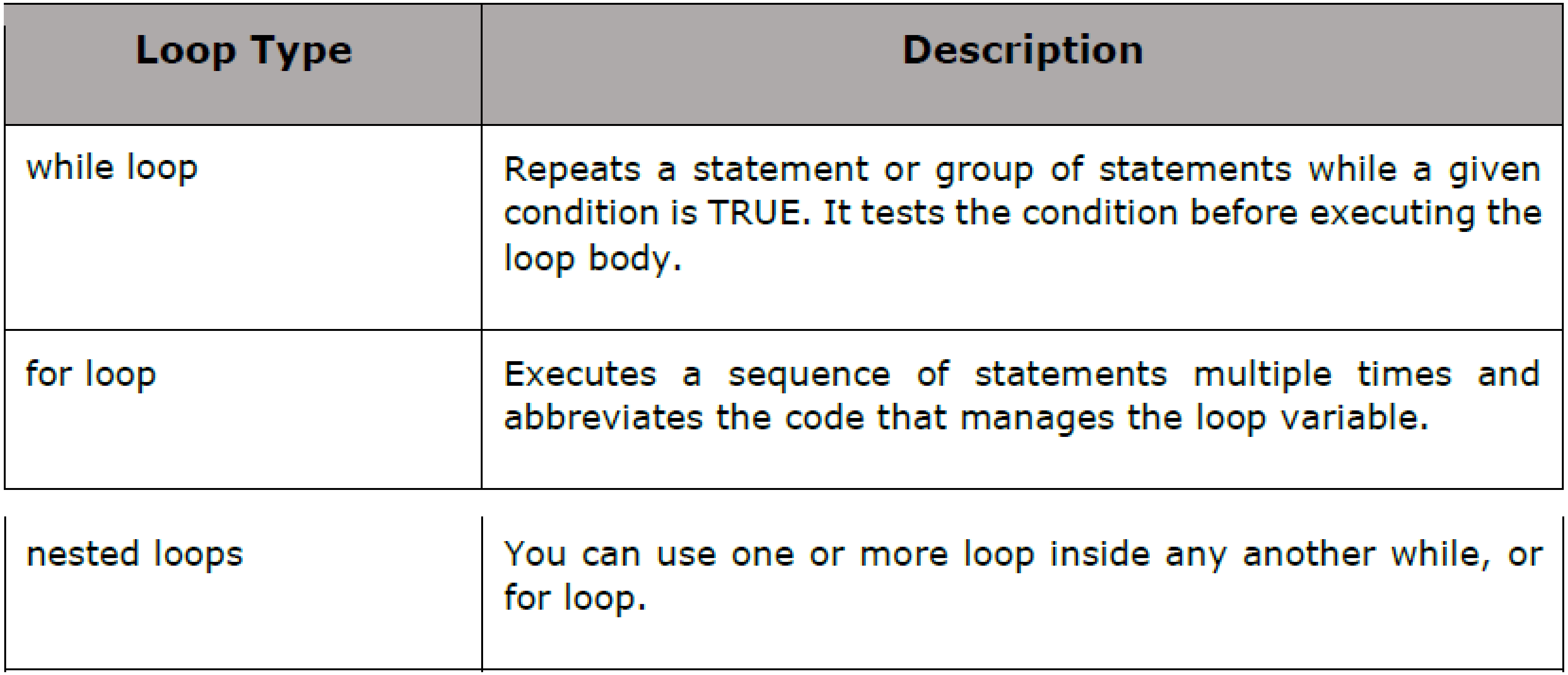
Python Loops

- In general, statements are executed sequentially- The first statement in a function is executed first, followed by the second, and so on.
- There may be a situation when you need to execute a block of code several number of times.
- Programming languages provide various control structures that allow more complicated execution paths.
- A loop statement allows us to execute a statement or group of statements multiple times.

Python Loops

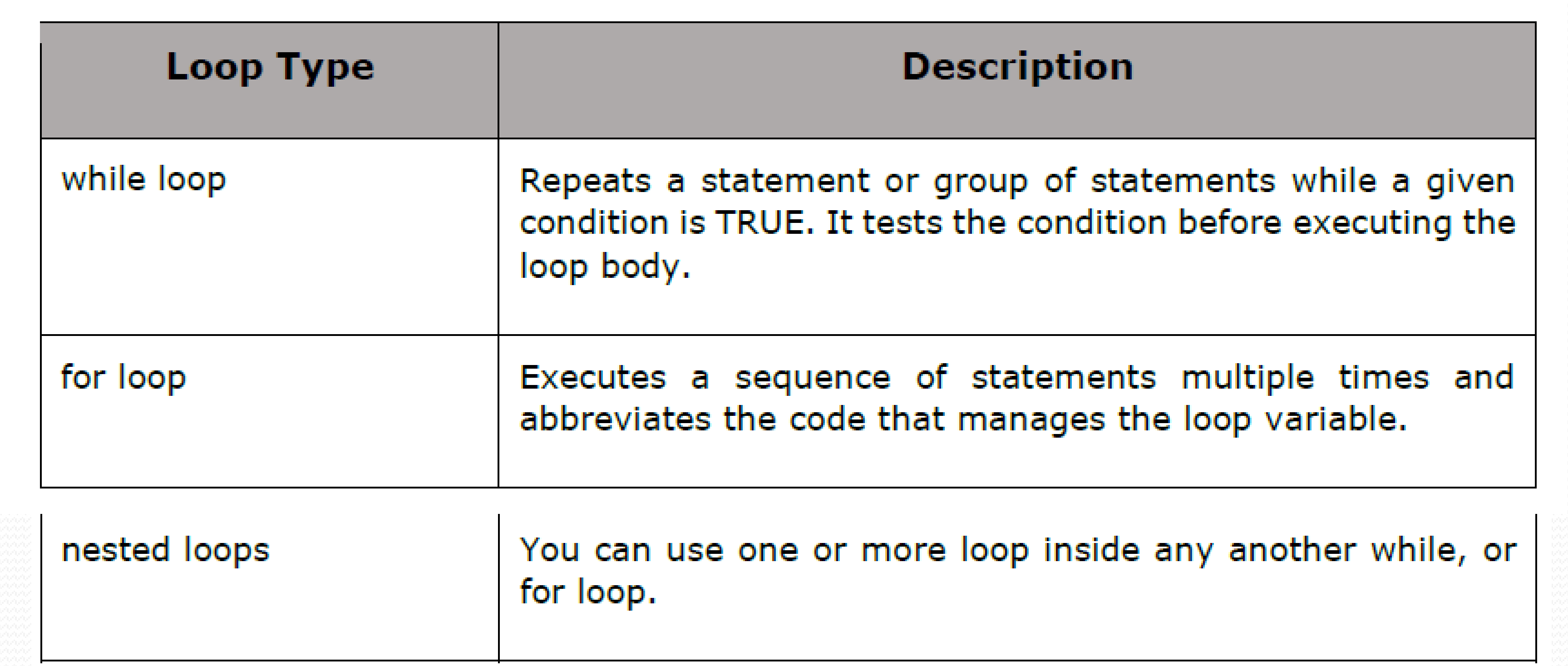


Python Loops



Loop Type	Description
while loop	Repeats a statement or group of statements while a given condition is TRUE. It tests the condition before executing the loop body.
for loop	Executes a sequence of statements multiple times and abbreviates the code that manages the loop variable.
nested loops	You can use one or more loop inside any another while, or for loop.

Python Loops



Loop Type	Description
while loop	Repeats a statement or group of statements while a given condition is TRUE. It tests the condition before executing the loop body.
for loop	Executes a sequence of statements multiple times and abbreviates the code that manages the loop variable.
nested loops	You can use one or more loop inside any another while, or for loop.

while Loop Statements

- **A while loop statement in Python programming language repeatedly executes a target statement as long as a given condition is true.**

```
while  expression:
           statement(s)
```

Infinite Loop Statements

- A loop becomes infinite loop if a condition never becomes FALSE.

```
num = 1
while  num == 1 : # This constructs an infinite loop
            num 1= int(input("Enter a number :"))
            print ("You entered: ", num1)
print ("Good bye!")
```

Using else Statement with Loops

- Python supports having an else statement associated with a loop statement.
  - If the else statement is used with a for loop, the else statement is executed when the loop has exhausted iterating the list.
  - If the else statement is used with a while loop, the else statement is executed when the condition becomes false.

Example

```
 count = 0
while count < 5:
        print (count, " is less than 5")
        count = count + 1
else:
        print (count, " is not less than 5")
```

for Loop Statements

- **The for statement in Python has the ability to iterate over the items of any sequence, such as a list or a string.**

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

range function

- The built-in function range() is the right function to iterate over a sequence of numbers.
- It generates an iterator of arithmetic progressions.

```
>> range(5)
```

Output:-

```
range(0,5)
```

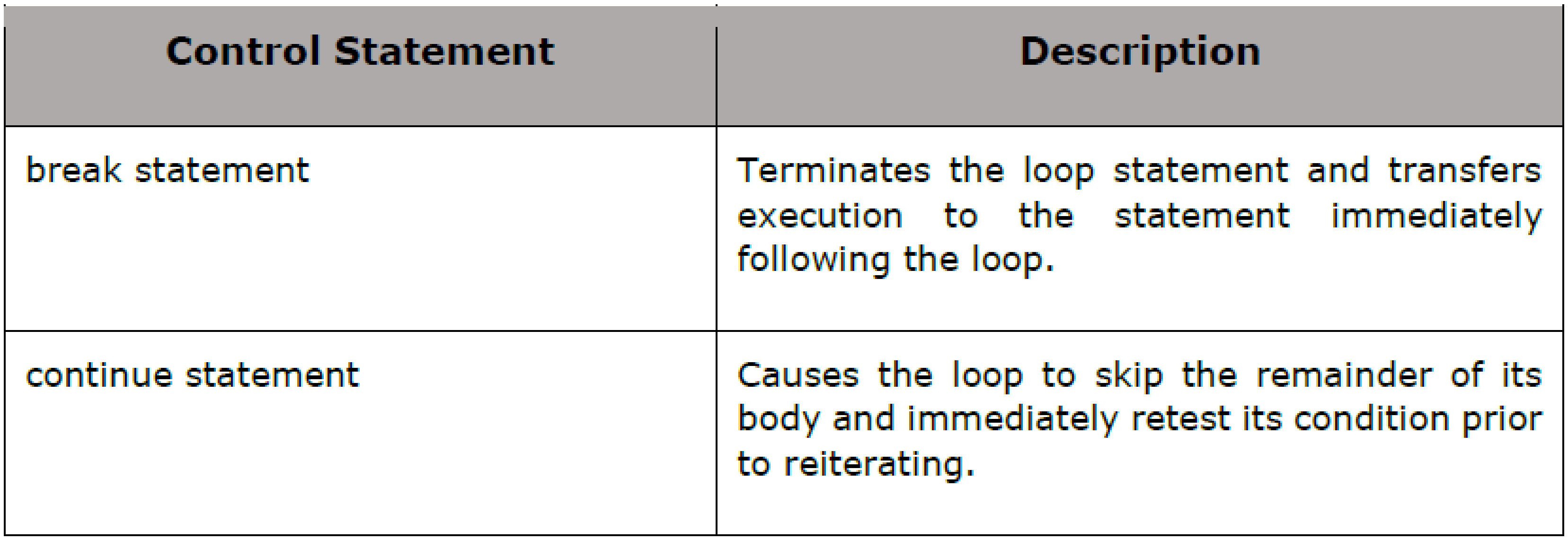
Nested Loop

- **Python programming language allows the use of one loop inside another loop..**

```
 for i in range(1,6):
    for j in range(1,i):
        print('*',end=" ")
      print('\n')
print('\n‘)
```

```
*
 * *
 * * *
 * * * *
```

Loop Control Statements

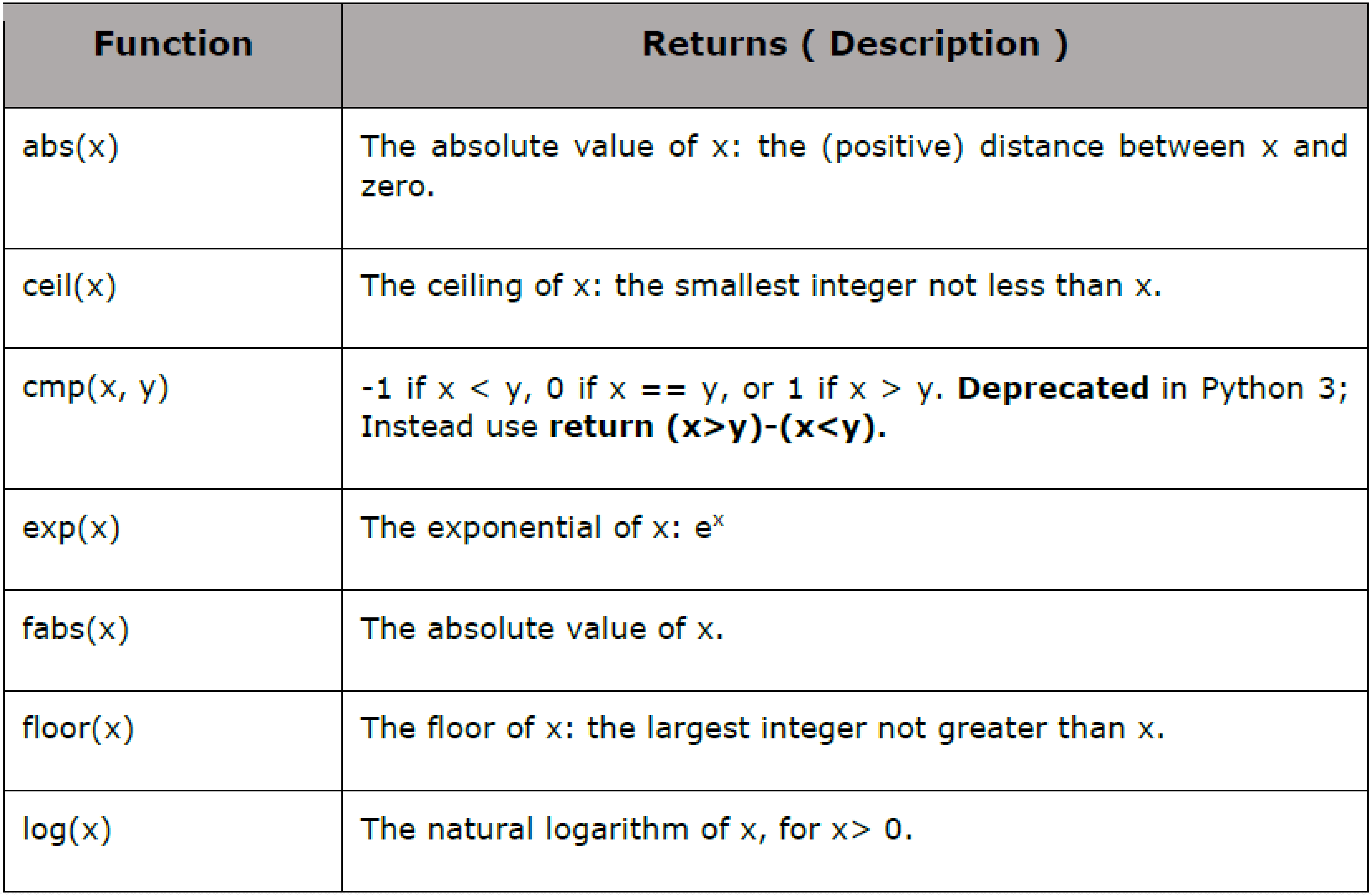


Control Statement	Description
break statement	Terminates the loop statement and transfers execution to the statement immediately following the loop.
continue statement	Causes the loop to skip the remainder of its body and immediately retest its condition prior to reiterating.

Iterator and Generator

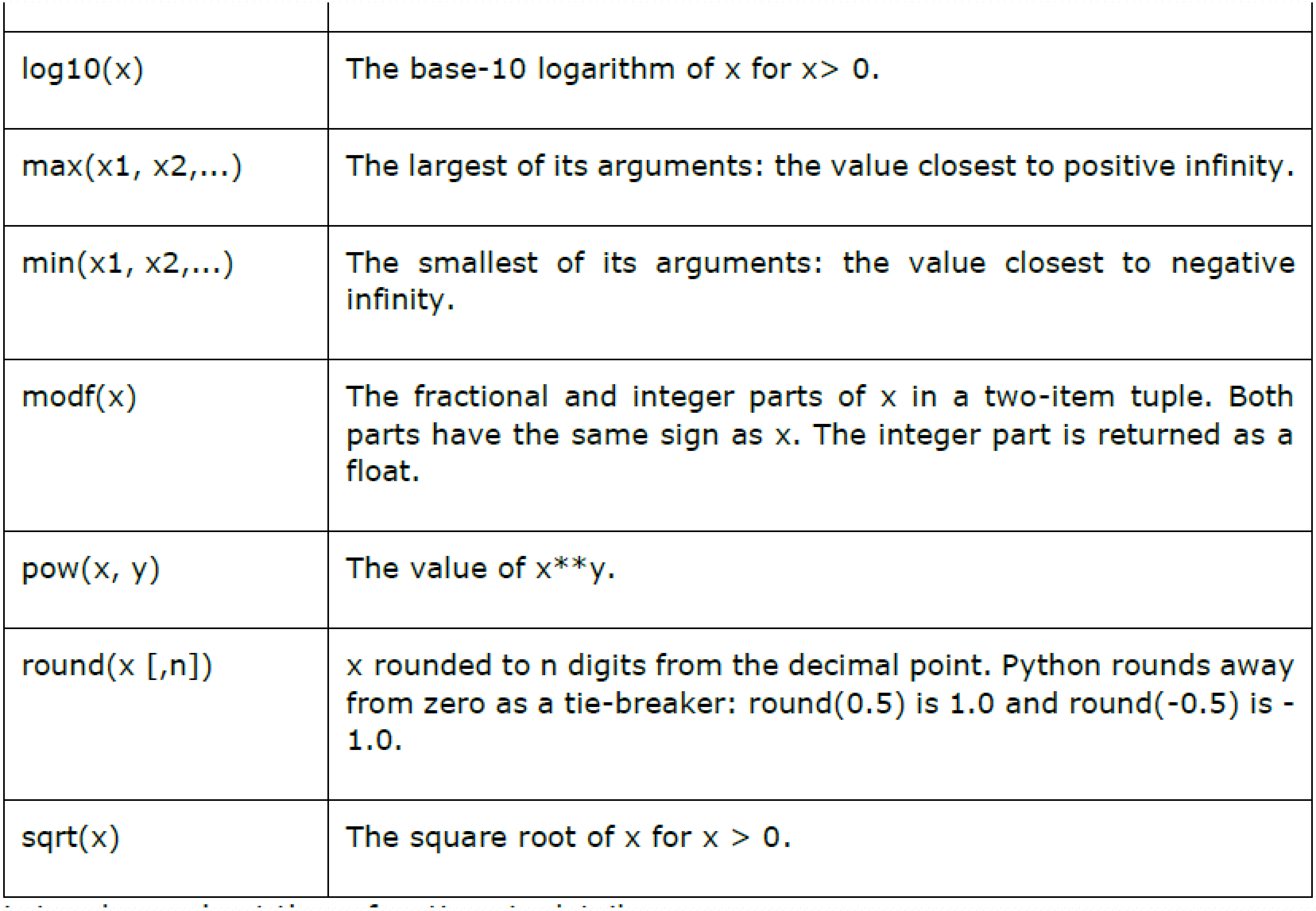
- **Iterator is an object, which allows a programmer to traverse through all the elements of a collection, regardless of its specific implementation.**
- **In Python, an iterator object implements two methods, iter() and next().**
- **String, List or Tuple objects can be used to create an Iterator.**

Mathematical Functions



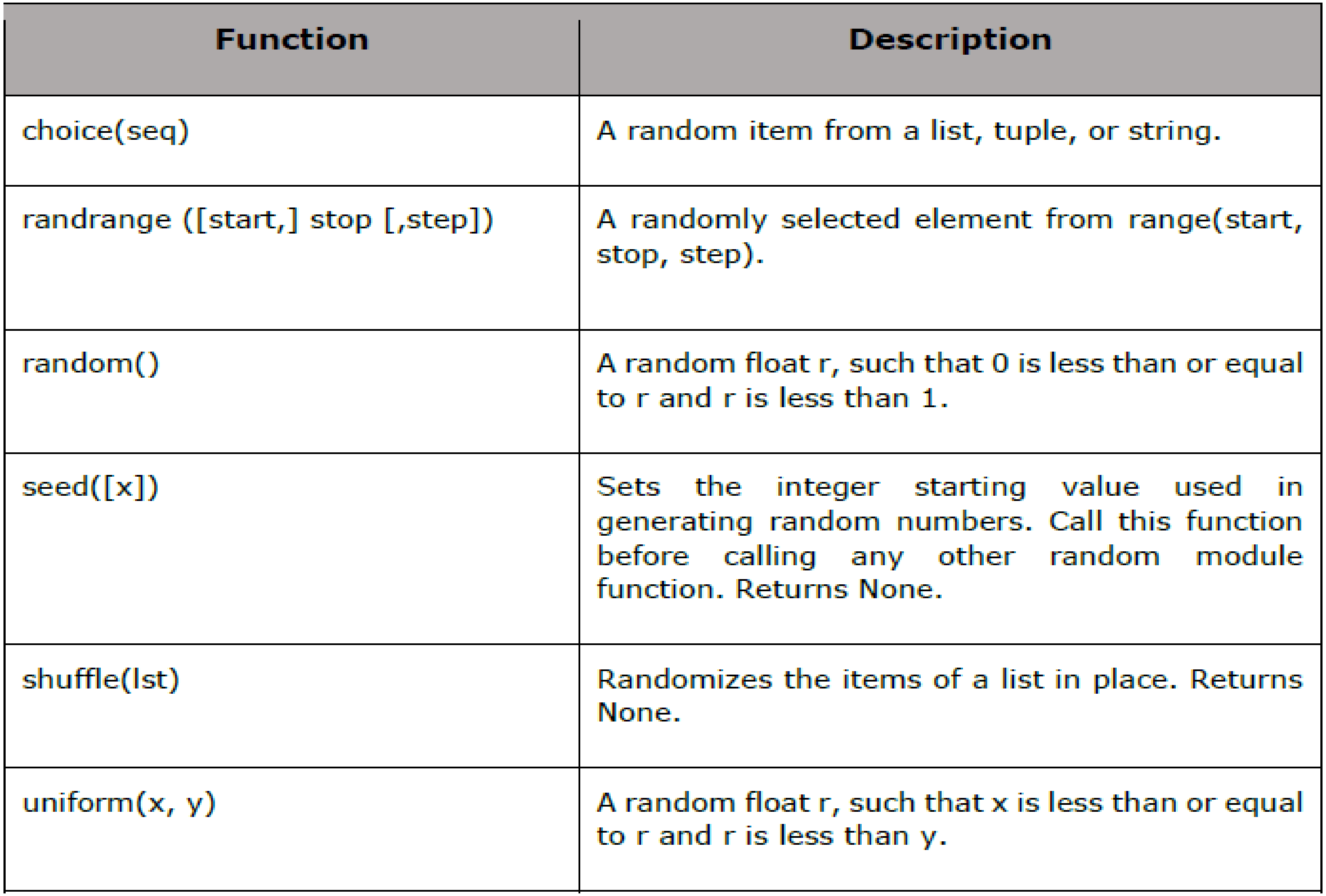
Function	Returns (Description)
abs(x)	The absolute value of x: the (positive) distance between x and zero.
ceil(x)	The ceiling of x: the smallest integer not less than x.
cmp(x, y)	-1 if x < y, 0 if x == y, or 1 if x > y. **Deprecated** in Python 3; Instead use **return (x>y)-(x<y).**
exp(x)	The exponential of x: e^x
fabs(x)	The absolute value of x.
floor(x)	The floor of x: the largest integer not greater than x.
log(x)	The natural logarithm of x, for x> 0.

Mathematical Functions



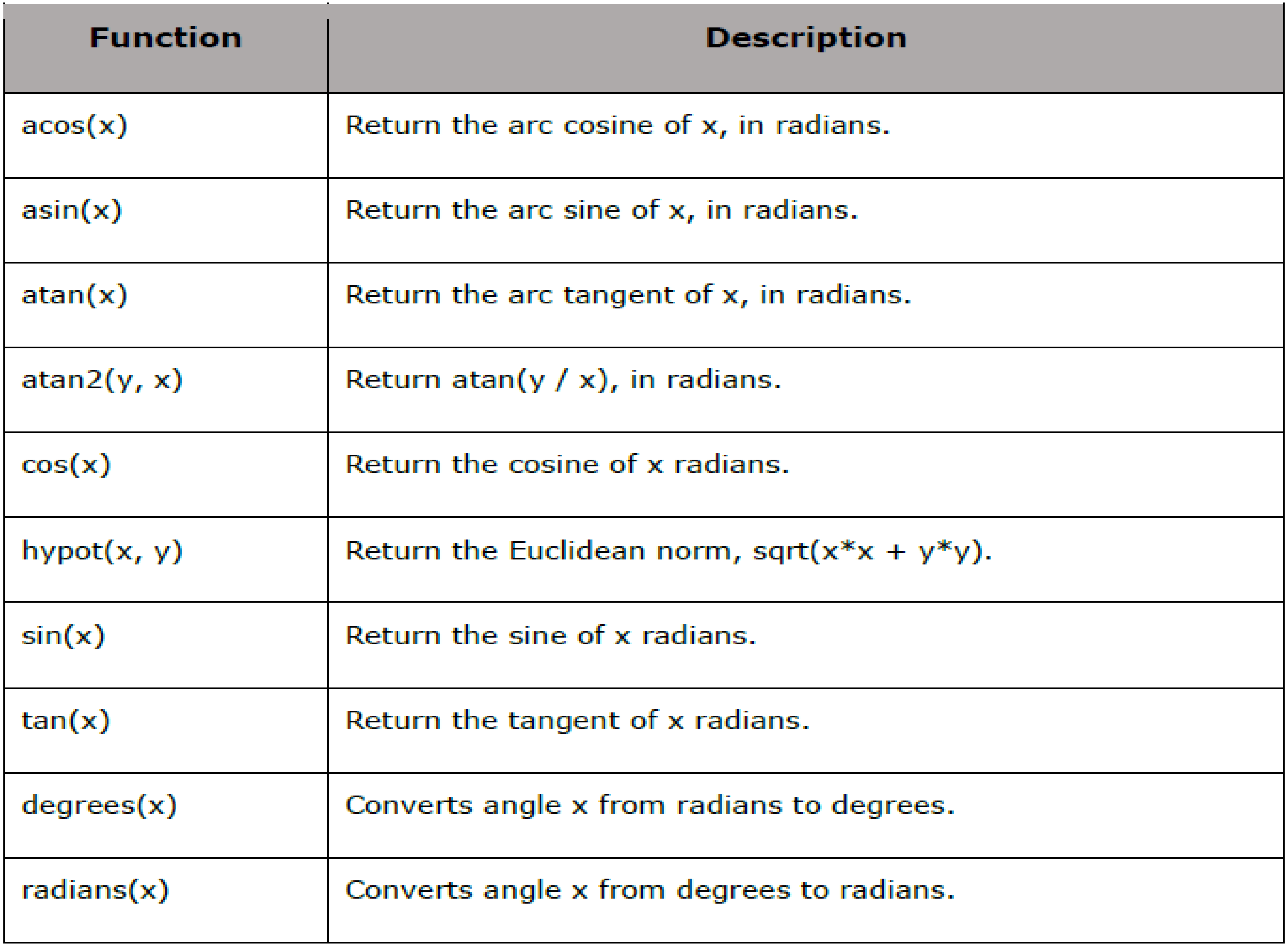
log10(x)	The base-10 logarithm of x for x> 0.
max(x1, x2,...)	The largest of its arguments: the value closest to positive infinity.
min(x1, x2,...)	The smallest of its arguments: the value closest to negative infinity.
modf(x)	The fractional and integer parts of x in a two-item tuple. Both parts have the same sign as x. The integer part is returned as a float.
pow(x, y)	The value of x**y.
round(x [,n])	x rounded to n digits from the decimal point. Python rounds away from zero as a tie-breaker: round(0.5) is 1.0 and round(-0.5) is -1.0.
sqrt(x)	The square root of x for x > 0.

Random Number Functions



Function	Description
choice(seq)	A random item from a list, tuple, or string.
randrange ([start,] stop [,step])	A randomly selected element from range(start, stop, step).
random()	A random float r, such that 0 is less than or equal to r and r is less than 1.
seed([x])	Sets the integer starting value used in generating random numbers. Call this function before calling any other random module function. Returns None.
shuffle(lst)	Randomizes the items of a list in place. Returns None.
uniform(x, y)	A random float r, such that x is less than or equal to r and r is less than y.

Trigonometric Functions



Function	Description
acos(x)	Return the arc cosine of x, in radians.
asin(x)	Return the arc sine of x, in radians.
atan(x)	Return the arc tangent of x, in radians.
atan2(y, x)	Return atan(y / x), in radians.
cos(x)	Return the cosine of x radians.
hypot(x, y)	Return the Euclidean norm, sqrt(x*x + y*y).
sin(x)	Return the sine of x radians.
tan(x)	Return the tangent of x radians.
degrees(x)	Converts angle x from radians to degrees.
radians(x)	Converts angle x from degrees to radians.

Home Work

Q.1 write a program to print odd number up to 100.

Q.2 write a program to print even number up to 100.

Q.3 write a program to print table of given number.

Q.4 write a program to sum of any 10 number.

Q.5 write a program to find given number is Armstrong number or not.

Q.6 write a program to reverse of given number.

Q.7 write a program to find greatest common division.

Q.8 write a program to find a^b (a raised to power b)

Q.9 write a program to find factorial of given number.

Q.10 write a program to check given number is prime or not.

Q.11 write a program to display *- Triangle

Q.12 write a program to find largest number from given 10 number.

Q.13 write a program to find largest number from given 10 number.

Q.14 write a program to convert binary to decimal and decimal to binary.

?

suniljoshi.cse@satiengg.org

Thank You