

# Python basics

Q1. What are the key features of Python?

Python is an easy to learn, powerful programming language. It is dynamic typing and interpreted language. Its key features are:

1. It does not require prior compilation
2. Python is Object oriented, high level programming language
3. Python is compatible with different platform
4. Simple to debug
5. Programmer friendly language
6. Dynamically typed Language

Q2. List Data Types in Python?

A data type is a classification of data which tells the interpreter how the programmer intends to use the data. Python supports various types of data such as:

Numerical : int, float, complex

Text : str

Sequence: list, tuple, range

Mapping: dict

set\_Types: set, frozenset

Boolean Types: True, False

Binary: bytes, bytearray

Q3. What are local variables and global variables in Python?

Global variable: In Python, a variable declared outside of the function or in global scope is known as a global variable. This means that a global variable can be accessed inside or outside of the function.

Local variable:

If a variable is assigned a value anywhere within the function's body, it's known to be a local. A variable declared inside the function's body or in the local scope is known as a local variable.

Example: `y = 30` # Global variable `def my_fun(): x = 20` # Local variable `print(x)`

`my_fun()` `print(y)` `print(x)`

Q4. How do you write comments in python? And Why Comments are important?

Comments are lines that exist in computer programs that are ignored by compilers and interpreters i.e non executable part of program.

Using comments in programs can make code more readable for humans, as it provides some information or explanation about what each part of a program is doing. Comments in Python begin with a hash mark (#) and whitespace character and continue to the end of the line.

Example:

```
# This is a comment
a = 24
```

Q5. How to comment on multiple lines in python?

We can use # or """ """ or ''' ''' to comment multiple lines Example1:

```
# This is multiline comment
# We can comment multiple lines
```

Example2: """ This is multiline comment We can comment multiple lines """

Example3: ''' This is multiline comment We can comment multiple lines '''

Q6. What do you mean by Python literals?

Literals are the raw data that are assigned to variables or constants while programming. There are different literals in Python, such as: 1.String literals 2.Numeric literals 3.Boolean literals

Q7. What are different ways to assign value to variables?

In Python, We can assign a value of any data type to variable in different ways as:

1. a = 24 # single value assignment
2. a = b = c = 12 # single value to multiple variables
3. a, b, c, = 10, 20, 30 # multiple values to multiple variables
4. a = 2; b = 4; c = 6 # using semicolon
5. a = 5  
b = 7 # on different lines

Q8. What are the Escape Characters in python?

The backslash (\) character is used to escape characters that otherwise have a special meaning, such as newline, backslash itself, or the quote character. It is used in representing certain whitespace characters: "\t" is a tab, "\n" is a newline, and "\r" is a carriage return.

Example: ` Prints single-quote print "\'" Pirnts double quote print "\"" \ Prints Backslash print "\\"

Q9. Which are the different ways to perform string formatting? Explain with example.

In Python, there are different ways by which we can perform string formatting.

1. using f string Example: s = "Python" print(f"Value is {s}")
2. using .format function s1 = 11; s2 = 22 print("Value of 1st input is {} and 2nd input is {}".format(s1,s2))
3. using % operator as format specifier for data type Msg = "Hi" num = 10 print("Message is %s and number is %d" %(Msg,num) )

Q10. Write a program to print every character of a string entered by the user in a new line using a loop

```
In [35]: s=input("Enter string: ")
print("Message is: ")
for i in range(len(s)):
    print(f"{s[i]}")
```

```
Enter string: Python
Message is:
P
y
t
h
o
n
```

Q11. Write a program to find the length of the string "machine learning" with and without using len function.

```
In [2]: print("Using len function")
Message=input("Enter any String: ")
Msg=len(Message)
print(Msg)
print(" ")
print("Without using len function")
s="machine learning"
c=0
for i in s: c+=1
print(c)
```

```
Using len function
Enter any String: machine learning
16
```

```
Without using len function
16
```

Q12. Write a program to check if the word 'orange' is present in the "This is orange juice".

```
In [35]: string = "This is orange juice."

substring = 'orange'

if substring in string:
    print(f'{substring} is present in given string.')
else:
    print(f'{substring} is not present in given string.')
```

```
orange is present in given string.
```

Q13. Write a program to find the number of vowels, consonants, digits, and white space characters in a string.

```
In [34]: v,c,d,sp=0,0,0,0
s="Python version is 3.8"
for i in s:
    if i in ("a","e","i","o","u","A","E","I","O","U"): v+=1
    elif i==" ":
        sp+=1
    elif i.isdigit():
        d+=1
    else : c+=1
print(f"Number of vowels are {v}, Number of spaces are {sp}, number of digits are {d}, Number of consonants are {c}")
```

Number of vowels are 5, Number of spaces are 3, number of digits are 2, Number of consonants are 11

Q14. Write a Python program to count Uppercase, Lowercase, special character, and numeric values in a given string.

```
In [2]: up,ll,sp=0,0,0
s=input("Enter string\t:")
for i in range(len(s)):
    if s[i].isupper()==True: up+=1
    elif s[i].islower()==True: ll+=1
    elif s[i] in ("!","@","$","%", "^","*", ".", "#", "&", "/"): sp+=1
print(f"Uppercase count: {up}\tLowercase count: {ll}\tSpecial Symbol count: {sp}")
```

Enter string : Hello @ Python  
 Uppercase count: 2      Lowercase count: 9      Special Symbol count: 1

Q15. Write a program to make a new string with all the consonants deleted from the string "Hello, have a good day".

```
In [31]: s="Hello, have a good day"
s1=""
for i in s:
    if i not in ("a","e","i","o","u","A","E","I","O","U"): continue
    else: s1+=i
print(s1)
```

eoaeaooa

Q16. Write a Python program to remove the nth index character from a non-empty string.

```
In [29]: s="Python"
str1=""
print(s)
n=int(input("Enter index value:"))
for i in range(len(s)):
    if i==n:
        pass
    else:
        str1=str1+s[i]

print(str1)
```

```
Python
Enter index value:3
Pyton
```

Q17. Write a Python program to change a given string to a new string where the first and last characters have been exchanged.

```
In [20]: s="Python"
s1=s[-1]+s[1:len(s)-1]+s[0]
print(f"Original string : {s}\nModified string : {s1}")
```

```
Original string : Python
Modified string : nythoP
```

Q18. Write a Python program to count the occurrences of each word in a given sentence.

```
In [17]: s="Python and Data Science.Python is an easy to learn, powerful pr
ogramming language."
c=s.count("Python")
print(c)
```

```
2
```

Q19. How do you count the occurrence of a given character in a string?

```
In [16]: s="Python and Data Science"
c=s.count("a")
print(c)
```

```
3
```

Q20. Write a program to find last 10 characters of a string?

```
In [15]: s="Python and Data Science"
print(s[len(s)-10:len(s)])
```

```
ta Science
```

Q21. WAP to convert a given string to all uppercase if it contains at least 2 uppercase characters in the first 4 characters.

```
In [14]: s=input("Enter any string")
up=0
for i in range(0,4):
    if ord(s[i])>=65 and ord(s[i])<=90: up+=1
print(up)
if up>=2:
    for i in s:
        print(i.upper(),end="")
```

Enter any stringPyThon and Data Science  
2  
PYTHON AND DATA SCIENCE

Q22. Write a Python program to remove a newline in Python.

```
In [10]: s="Python\nis good."
print(s)
print(s.replace("\n", " "))
```

Python  
is good.  
Python is good.

Q23. Write a Python program to swap commas and dots in a string ○ Sample string: "32.054,23" ○ Expected Output: "32,054.23"

```
In [8]: s="32.054,23"
print(s)
for i in s:
    if i==".": print(",",end="")
    elif i==",": print(".",end="")
    else: print(i,end="")
print("\n")
d=s.maketrans(",.", ".,")
```

32.054,23  
32,054.23

Q24. Write a Python program to find the first repeated character in a given string

```
In [12]: Char=input("Enter any String\t:")
str1=""
for i in Char:
    if i not in str1: str1=str1+i
    else: print(f"The first repeated character is: {i} ")
```

Enter any String :PythonP  
The first repeated character is: P

Q25. Write a Python program to find the second most repeated word in a given string

```
In [13]: s = "abc hi xyz hi abc hello abc"
print(s)
l=s.split()
d={}
for i in l:
    if i in d: d[i]+=1
    else: d[i]=1

d1={ v:v for k,v in d.items() }
for k,v in d.items():
    if v>=2 and v<3: print(k,v)
```

abc hi xyz hi abc hello abc  
hi 2

Q26. Python program to Count Even and Odd numbers in a string

```
In [22]: s=input("Enter \t:")
e,o,fl=0,0,0
for i in s:
    if i.isdigit()==True:
        if int(i)%2==0: e+=1
        else: o+=1
    else: fl+=1
if fl==len(s): print("It's string...!")
else: print(f"strin has even {e} number of characters\nstring has odd {o} number of characters")
```

Enter \t:He5llo2Hi10k7  
strin has even 1 number of characters  
string has odd 3 number of characters

Q27. How do you check if a string contains only digits?

```
In [32]: Str=input("Enter any string: ")
if Str.isdigit()==True:
    print(f"String {Str} contains only digits")
else:
    print(f"String {Str} doesnot contain only digits")
```

Enter any string: 12345  
String 12345 contains only digits

Q28. How do you remove a given character/word from String?

Replace can be used to remove a character from a string in Python. But replace() is mostly used to replace a new character with an older character. So instead we can use "" i.e empty string to remove a character from a string.

Q29. Write a Python program to remove the characters which have odd index values of a given string

```
In [6]: s="Python is good"
for i in range(len(s)):
    if (i%2==0): print(s[i],end="")
```

Pto sgo

Q30. Write a Python function to reverses a string if its length is a multiple of 5

```
In [14]: Message=input("Enter any message: ")
Msg=""

if(len(Message)%5==0):
    for i in range(1,len(Message)+1):
        Msg+=Message[-i]
    print("New Message: ",Msg)
else:
    print(f"Message: {Message} is not multiple of 5")
```

Enter any message: Hello  
New Message: olleH

Q31. Write a Python program to format a number with a percentage(0.05 >> 5%)

```
In [86]: number = 0.05
print(f" Number formatting: {number:.0%}")
print("")
```

Number formatting: 5%

Q32. Write a Python program to reverse words in a string

```
In [7]: Message=input("Enter any message: ")
Msg=""
for i in range(1,len(Message)+1):
    Msg+=Message[-i]
print("New Message: ",Msg)
```

Enter any message: Hello Python for Data Science  
New Message: ecneicS ataD rof nohtyP olleH

Q33. Write a Python program to swap cases of a given string

```
In [5]: Message=input("Enter any message: ")
Msg=Message.swapcase()
print("New Message: ",Msg)
```

Enter any message: Hello Python for Data Science  
New Message: hELLO pYTHON FOR dATA sCIENCE

Q34. Write a Python program to remove spaces from a given string

```
In [4]: Message=input("Enter any message: ")
Msg=Message.replace(" ","")
print("New Message: ",Msg)
```

Enter any message: Hello Python for Data Science  
New Message: HelloPythonforDataScience

Q35. Write a Python program to remove duplicate characters of a given string



```
In [90]: string = input("Enter a string: ")
print(f"Original String: {string}")
rm_dup = ""
for i in string:
    if i not in rm_dup :
        rm_dup += i
print(f"String after removing duplicate chracters: {rm_dup}")
```

Enter a string: HiiHello  
Original String: HiiHello  
String after removing duplicate chracters: Hielo

Q36. Write a Python Program to find the area of a circle

```
In [28]: print("Area of circle")
pi=3.14
r=int(input("Enter radius: "))
area=pi*r*r
print(f"Area of circle having radius of {r} is: {area} ")
```

Area of circle  
Enter radius: 2  
Area of circle having radius of 2 is: 12.56

Q37. Python Program to find Sum of squares of first n natural numbers

```
In [1]: Number = int(input("Enter value of N: "))
nat_sum = 0
for i in range(1, Number+1):
    nat_sum += (i*i)

print(f"Sum of squares of first {Number} natural Number = ", nat_s
um)
```

Enter value of N: 5  
Sum of squares of first 5 natural Number = 55

Q38. Python Program to find cube sum of first n natural numbers

```
In [2]: Number = int(input("Enter value of N: "))
nat_sum = 0
for i in range(1, Number+1):
    nat_sum += (i*i*i)

print(f"Sum of cubes of first {Number} natural Number = ", nat_su
m)
```

Enter value of N: 5  
Sum of cubes of first 5 natural Number = 225

Q39. Python Program to find simple interest and compound interest

```
In [5]: p = float(input('Enter amount: '))
t = float(input('Enter time: '))
r = float(input('Enter rate: '))

s_intr = (p*t*r)/100
c_intr = p*((1+r/100)**t-1)

print(f"Simple interest is: {s_intr}")
print(f"Compound interest is: {c_intr}")
```

```
Enter amount: 2000
Enter time: 2
Enter rate: 2
Simple interest is: 80.0
Compound interest is: 80.79999999999998
```

Q40. Python program to check whether a number is Prime or not.

```
In [20]: number = int(input("Enter any Number: "))

if number > 1:
    for i in range(2,int(number/2)+1):
        if (number % i == 0):
            print(f"The given number {number} is not a Prime Number")
            break
    else:
        print(f"The given number {number} is a Prime number")
#
else:
    print(f"The given number {number} is not a Prime number")
```

```
Enter any Number: 5
The given number 5 is a Prime number
```