```
#Strings - collection of character inside "Double quotes" or 'Single quotes'
#you can use single quotes inside double quotes or double quotes inside single quotes
#Parenthesis means bracket
print("Hello World")
print('Hello World')
print("hello 'world' world ")
print('hello "world" world')
#jaise hm single quotes ke under single quotes use nhi kr sakte h usi trah double quotes ke under double quotes nhi karte h
#print('hello 'world' world') syntax error
#print('I'm Gopal') syntax error
#print("hello "world" world") syntax error
print("I'm Gopal")
```

```
⌐→   Hello World
     Hello World
     hello 'world' world
     hello "world" world
     I'm Gopal
```

```
#escape sequence
print("hello \"world\" world")
print('I\'m Gopal')
print("line A\nline B \n line C")
print("name \tGopal")
print("this is \ backslash")
#print("this is backslash\") syntax error (EOL)
print("this is backslash\\")
print("this is double backslash\\\\")
print("hell\blo")
#\b use for backspace
```

```
     hello "world" world
     I'm Gopal
     line A
     line B
      line C
     name    Gopal
     this is \ backslash
     this is backslash\
     this is double backslash\\
     hello
```

```
# for comment ctrl then / and uncomment same path follow
#this is comment
print("line A\nline B \n line C") #\n is use for new line
print("name \tGopal") #\t is for tab
print("this is backslash\\") #\\ is for backslash
print("this is double backslash\\\\") #\\\\ is for double backslash
print("hell\blo")
```

```
     line A
     line B
      line C
     name    Gopal
     this is backslash\
     this is double backslash\\
     hello
```

```
# escape characters as normal text
#output: line A \n line B
print("line A \\n line B") #double backslash treats as single backslash and n treat as normal text
print("line A \\t line B")
print("this is 4 backslash \\\\\\\\")
#output: \" \'
print(" \" \' ")
print(" \\\" \\\' ")
# \' - ' (a)
# \\ - \ (b)
# \\\' - \'
```

```
     line A \n line B
     line A \t line B
     this is 4 backslash \\\\
      " '
      \" \'
```

```
# **************print these following lines ******************
# this is double \\ backslash
# these are /\/\/\/\/\ mountains
# he is     awesome (use escape sequence instead of manual spaces)
```

```
# \" \n \t \' (print these as an output)
print ("this is double \\\\ backslash")
print("these are /\\/\\/\\/\\/\\ mountains")
print("he is \tawesome")
print(" \\\" \\n \\t \\\' ")
# \" - "
# \\ - \
# \\\" - \"
    this is double \\ backslash
    these are /\/\/\/\ mountains
    he is   awesome
     \" \n \t \'


# r laga k kisi bhi escape sequence ko normal text ke trah treat kr sakte
print(r"line A \n line B\n line C")
print(r"line A \" line B")

    line A \n line B\n line C
    line A \" line B


#variable ki value change kr sakte h
number1 = 2 #number1 assign 2
print(number1)
number1 = 4
print(number1)
#string, number store
name = "Gopal"
print(name)
name = 123
print(name)
#phle string store kiya variable me uske bad number store kra diya to ise dyanmic khte h
#Python dynamic programming language h
# rule:-
# (1) variable number se start nhi ho skta but beech me number use ho skta h
# (2) letter, _ ............. first letter
# (3) special symbol use nhi kr skte h variable me ex:- $
#Convention
# user_one_name = "Rohit" #snake case writing (python) More than one variable
# userOneName = "Mohit" #camel case writing (java)


    2
    4
    Gopal
    123


# emoji list - unicode.org emoji
print("\U0001F603")
print("\U0001F602")
print("\U0001F970")
print("\U0001F60E")
print("\U0001F498")

    😃
    😂
    🥰
    😎
    💘
```

```
# Calculator
print(2+3*4)
print(2/4) # float division gives output floating point number (wo number jiske under point hota h)
print(4/2)
print(4//2) # integer division fraction part cut
print(2//4)
print(2**3)
print(2**0.5)
print(round(2**0.5, 4))
print(2**3/2*6-4*(3-4/2))
print(3%2) # modulo gives remainder
print((2+3)*2) # precedence rule
print((2+3)/2)
#(2+3)/2 =5/2
print((2+3)*5/2%6)
# 5 * 5 / 2 % 6
# 25 / 2 % 6
print(12.5 % 6)
print(2**3**2)
# 2**9
print(2**9)
print(3**2**1)
```

```
    14
    0.5
    2.0
    2
    0
    8
    1.4142135623730951
    1.4142
    20.0
    1
    10
    2.5
    0.5
    0.5
    512
    512
    9
```

```
# ********************** summmary of chapter one ***************
#print(function)
#print("hello \"hello\' ")

#escape sequence
#print("line A \t line B")
#print("this is bakslsash \\")

#escape sequence as normal text
#print("line A \\t line B")
#print(r"line A \t line B")

#python as calculator
#print(4/2)
#print(4//2)
#print(3//2)
#print(2**3**2)
#print((2+3)*4/2)

#variables
#name ="Gopal"
#print(name)
#name = 264
#print(name)

#naming rules for variables
# 1name = "Gopal" #error
# name1 = "Gopal" #no error
# name$ = "Gopal" #error
# $name = "Gopal" #error
# _name = "Gopal" #no error

#convention for variable naming
# user_name = "Gopal" #snake case writing
# userName = "Gopal" #camel case writing


# string concatenation (chapter 2)
# string - collection of characters inside single quotes or double quotes
# conatenation - do string ko aapas me jorna
first_name = "Gopal "
```

```
last_name = "Mishra"
full_name = first_name + last_name
print(full_name)
first_name = "Gopal"
last_name = "Mishra"
full_name = first_name + " " + last_name
print(full_name)
#print(first_name + "3") no error
#print(first_name + str(3)) no error
#print(first_name + 3) error
print(first_name * 3) #no error
```

```
    Gopal Mishra
    Gopal Mishra
    GopalGopalGopal
```

```
# user input
# input function
name = input("Type your name ")
print("Hello " + "Gopal")
# input function hamesha jo user se input lega wo "string" me lega
age = input("what is your age ? ")
# 19, "19"
print("your age is " + age)
```

```
    Type your name Gopal
    Hello Gopal
    what is your age ? 19
    your age is 19
```

```
# int() function
#number_one = input("Enter first number ") #4
#number_two = input("Enter second number ") #4
#total = number_one + number_two
#print("total is " + total)
# total = "4" + "4" = 44
#number_one = int(input("Enter first number "))
#number_two = int(input("Enter second number "))
#total = number_one + number_two
#print("total is " + str(total))
#string 4 ----> "4"
#int "4" -----> 4
#float "4" ----> 4.0
number1 = str(4)
number2 = float("44")
number3 = int("33")
print(number2 + number3) #float
```

```
    77.0
```

```
name, age = "Gopal", "19"
print("Hello " + name + " your age is " + age)
x=y=z=1
print(x+y+z)
```

```
    Hello Gopal your age is 19
    3
```

```
# Two or more input in one line
name = input("enter your name: ")
age = input("enter your age: ")
name, age = input("enter your name and age ").split()
print(name)
print(age)
name, age = input("enter your name and age ").split(",")
print(name)
print(age)
```

```
    enter your name: Gopal
    enter your age: 19
    enter your name and age Gopal 19
    Gopal
    19
    enter your name and age Gopal,19
    Gopal
    19
```

```
name = "Gopal"
age = 19
```

```
print("Hello " + name + " your age is " + str(age + 2)) # Ugly(lamba) syntax
# String formating
# python 2
# python 3
# python 3.6 (best)
print("Hello {} your age is {} ".format(name, age + 2)) # Python 3
# python 3.6
print(f"Hello {name} your age is {age +2}") #clean syntax

        Hello Gopal your age is 21
        Hello Gopal your age is 21
        Hello Gopal your age is 21


# Ask user to input 3 numbers and you have to print average of three numbers using string formating
#Bonus:-Try to take all three comma seperated inputs in one line
#num1 = input("enter first number :")
#num2 = input("enter second number :")
#num3 = input("enter third number :")
num1, num2, num3 = input("enter three numbers comma separated: ").split(",")
# (int(num1) + int(num2) + int(num3)) / 3
print(f"average of three number : {(int(num1) + int(num2) + int(num3)) / 3}")

        enter three numbers comma separated: 3,3,3
        average of three number : 3.0


# String indexing
language = "python" #language me string h
#positions(index number)
#p = 0 , -6
#y = 1 , -5
#t = 2 , -4
#h = 3 , -3
#o = 4 , -2
#n = 5 , -1
print(language[3]) #[] :- square bracket index number likhne ke liye lagate h
print(language[-4])
#print(language[6]) #index error
#print(language[-7]) #index error

        h
        t


# String slicing / selecting sub sequences
lang = "Python"
#print(lang[3])
#string :---> [start argument : stop argument -1]
print(lang[1:4])
print(lang[-5:-2])
print(lang[-5:4])
print(lang[:])
print(lang[1:])
print(lang[:3])

        yth
        yth
        yth
        Python
        ython
        Pyt


#Step argument
#Syntax :---> [start argument : stop argument -1 : step]
print("Gopal"[1:3])
print("Gopal"[0:6:1])
print("Gopal"[0:6:2])
print("Gopal"[0::2])
print("Gopal"[0::3])
print("Gopal"[::2])
print("Gopal"[3::-1])
print("Gopal"[3::-2])
print("Gopal"[-1::-1])
print("Gopal"[::-1]) #trick

        op
        Gopal
        Gpl
        Gpl
        Ga
        Gpl
        apoG
        ao
```

```
        lapoG
        lapoG
```

```python
# Ask user name print back user name in reverse order
# Try to make your program in 2 lines using string formating
name = input("enter your name : ")
#reverse = name[-1::-1]
#print(f"reverse of your name is {reverse}")
print(f"reverse of your name is {name[-1::-1]}")
```

```
        enter your name : Gopal
        reverse of your name is lapoG
```

```python
# String methods
name = "GoPaL miShRa"

# 1. len() function
print(len("Gopal"))
print(len(name))
#length = len(name)
#print(length)

# 2. lower() method
print(name.lower())

# 3. upper() metod
print(name.upper())

# 4. title() method ---> first character converts to capital letter
print(name.title())

# 5. count() method
print(name.count("a"))
print(name.count("p"))
```

```
        5
        12
        gopal mishra
        GOPAL MISHRA
        Gopal Mishra
        2
        0
```

```python
# Exercise
# take two comma separated inputs from user
# 1.) user's name , example - "Harshit"
# 2.) a single character , "H"

# output - 2 print lines
# 3.) user's name length
# 4.) count the character that user inputed (bonus: case insensitive count)

name, char = input("enter comma separated name and character : ").split(",")
print(f"length of your name is {len(name)}")
print(f"character count : {name.count(char)}") # case sensitive
# Harshit - harshit
# H - h
print(f"character count : {name.lower().count(char.lower())}") # case insensitive
```

```
        enter comma separated name and character : Harshit,h
        length of your name is 7
        character count : 1
        character count : 2
```

```python
# Solve problem with spaces using strip method
name = "    Gopal        "
dots = ".............."
# lstrip() method
# rstrip() method
print(name + dots)
print(name.lstrip() + dots)
print(name.rstrip() + dots)
print(name.strip() + dots)
name = "    har    shit        "
dots = "............."
print(name.replace(" ", "") + dots)
name, char = input("enter comma separated name and character : ").split(",")
print(f"length of your name is {len(name)}")
print(f"character count : {name.strip().lower().count(char.strip().lower())}")
```

```
# "  Harshit  " ------> "Harshit" -------> "harshit"
# " H  " -------> "H" -------> "h"
        Gopal        ..............
    Gopal        ..............
        Gopal..............
    Gopal..............
    harshit.............
    enter comma separated name and character :        Harshit     ,       h
    length of your name is 22
    character count : 2
```

```
# replace() method
# find() method
string = "He is handsome and he is good dancer"
print(string.replace(" ","_"))
print(string.replace("is","was"))
print(string.replace("is", "was", 1))
print(string.replace("is","was",3))
print(string.find("is"))
print(string.find("is",4))
is_pos1 = string.find("is") # is_pos1 -----> number
#is_pos2 = string.find("is", is_pos1)
is_pos2 = string.find("is", is_pos1 + 1)
print(is_pos2)
```

```
    He_is_handsome_and_he_is_good_dancer
    He was handsome and he was good dancer
    He was handsome and he is good dancer
    He was handsome and he was good dancer
    3
    22
    22
```

```
# Center method
name = "Gopal"
# ***Gopal*** , 11
print(name.center(9, "*"))
print(name.center(7, "*"))
print(name.center(11, "*"))
print(name.center(6, "*"))
name = input("enter your name : ")
print(name.center(len(name)+6, "*"))
```

```
    **Gopal**
    *Gopal*
    ***Gopal***
    Gopal*
    enter your name : Gopal
    ***Gopal***
```

```
# Strings are immutable
string = "string"
print(string[1])
new_string = string.replace('t', 'T')
print(new_string)
print(string.replace('t', 'T'))
```

```
    t
    sTring
    sTring
```

```
# Assignment operators
name = "Gop"
#name = name + "al"
name += "al"
print(name)
age = 19
#age = age + 1
#age += 1
#age -= 1
age *= 1
print(age)
```

```
    Gopal
    19
```

```
# Chapter 2 summary
# String
```

```
#name = "harshit"
#name[2] = "s"  # can't change string
# string indexing
#print(name[1])
#print(name[-2])
# string slicing
#print(name[0:5])
#print(name[0:-2])
#print(name[-4:])
#print(name[:-2])
#print(name[0:5:1])
#print(name[0:5:2])
#print(name[-1:0:-1])
#print(name[-1:-7:-1])
# take user input
#age = int(input("enter your age : "))
#print(age)
# take two user inputs
#user_name, age = input("enter your name and age : ").split()
#user_name, age = input("enter your name and age : ").split(",")
#print(user_name)
#print(age)
# len function
#name = "Gopal"
#print(len(name))
# lower, upper, title method
#print(name.lower())
#print(name.upper())
#print(name.title()) # first character converts to capital letter
# find, replace, center method
#name = "hArShitr"
#r_pos = name.find("r")
#r_pos_2 = name.find("r", r_pos +1)
#print(r_pos_2)
#print(name.center(9,"*"))
#print(name.center(11,"*"))
name = "gopal"
print(name.replace("g","G",1))
print(name) #strings are immutable
# strings are immutable
```

```
    Gopal
    gopal
```

```
# If statement
# code
# If condition is true then this code will execute
age = input("enter your age is : ")
age = int(age)
if age >= 14:
#print("you are above 14")  # Indentation error
  print("you are above 14")
  print("Line A")
```

```
    enter your age is : 15
    you are above 14
    Line A
```

```
# Pass statement
# yadi if statement ke under block me kuchh bhi nhi likhege to syntax error hoga
# pass ka matlab hme kuchh bhi nhi likhange
x = 18
if x >18:
  pass
```

```
# Else statement
age = input("enter your age is : ")
age = int(age)
if age >= 14:
  print("you are above 14")
  print("Line A")
else:
  print("sorry, you can't play ")
# if ke bad else ayega nhi to nhi ayega
```

```
    enter your age is : 13
    sorry, you can't play
```

```
# Exercise
# Number guessing game
```

```
# Make a variable, like winning_number and assign any number to it
# Ask user a guess number
# if user guessed correctly  then print "YOU WIN !!!!"
# if user didn't gussed correcrly then :
  # if user gussed lower than actual number then print "too low"
  # if user gussed higher than actual number then print "too high"


# google "how to generate random number in python " to generate random
# winning number
# = use for assign
# == use for check
# nested if - else



winning_number = 27
user_input = input("guess a number b/w 1 & 100 : ")
user_input = int(user_input)
if user_input == winning_number:
  print("YOU WIN !!!!")
else: # nested if else
  if user_input < winning_number:
    print("too low")
  else:
    print("too high")


    guess a number b/w 1 & 100 : 28
    too high


# Check two conditions at same time
# and , or operator
name = 'abc'
age = 19
if name=='abc' and age==19:
# if name=='abcd' and age==19   Condition False
# if name=='abc' and age==20    Condition False
  print("Condition True")
else:
  print("Condition False")


    Condition True


name = 'abc'
age = 19
if name=='abc' or age==19:
#if name=='abcd' or age==19: Condition True
#if name=='abc' or age==20: Condition True
#if name=='abcd' or age==20: Condition False
  print("Condition True")
else:
  print("Condition False")


    Condition True


# EXERCISE - WATCH COCO
# Ask user's name and age
# If user's name start with ('a' or 'A') and age is above 10 then
# print 'you van watch coco movie'
# Else print 'sorry, you cannot watch coco movie'

user_name = input("enter your name please : ")
user_age = input("enter your age please : ")
user_age = int(user_age)
if user_age >= 10 and (user_name[0]=="a" or user_name[0]=="A"):
  print("you can watch coco")
else:
  print("you cannot watch coco")


    enter your name please : Ankit
    enter your age please : 11
    you can watch coco


# if elif else statement

# show ticket pricing
# 1 to 3 (free)
# 4 to 10 (150)
```

```python
# 11 to 60 (250)
# above 60 (200)

age = input("please input your age : ")
age = int(age)
if age==0 or age<0:
  print("you can't watch")
if 0<age<=3:
  print("Ticket price : Free")
elif 3<age<=10:
  print("Ticket price : 150")
elif 10<age<=60:
  print("Ticket price : 250")
else:
  print("Above 60 : 200")
```

```
    please input your age : 0
    you can't watch
    Above 60 : 200
```

```python
age = input("please input your age : ")
age = int(age)
if age==0 or age<0:
  print("you can't watch")
elif 0<age<=3:
  print("Ticket price : Free")
elif 3<age<=10:
  print("Ticket price : 150")
elif 10<age<=60:
  print("Ticket price : 250")
else:
  print("Above 60 : 200")
```

```
    please input your age : 0
    you can't watch
```

```python
# in keyword
# if with in
name = "Harshit"
if "h" in name: # in place of name we can also write "Harshit"
  print("h is present in name")
else:
  print("not present")
```

```
    h is present in name
```

```python
# Check Empty or Not
name = "Gopal"
if name:
  print("string is not empty")
else:
  print("string is empty")
```

```
    string is not empty
```

```python
name = ""
if name:
  print("string is not empty")
else:
  print("string is empty")
```

```
    string is empty
```

```python
name = input("enter your name : ")
if name:
  print(f"your name is {name}")
else:
  print(f"you didn\'t type anything")
```

```
    enter your name : Gopal
    your name is Gopal
```

```python
# Loops
# while loop, for loop
# print("hello world") # 10 times

i = 1 #i=2, i=3, ...... , i=10
while i<=10:
```

```
    print("hello world")
  i=i+1hello world
      hello world
      hello world
      hello world
      hello world
      hello world
      hello world
      hello world
      hello world
      hello world
```

```
i = 2 #i=3, i=4,...........,i=10
while i<=10:
  print(f"hello world {i}")
  i=i+1
```

```
      hello world 2
      hello world 3
      hello world 4
      hello world 5
      hello world 6
      hello world 7
      hello world 8
      hello world 9
      hello world 10
```

```
i = 1
while i<=10:
  print(f"hello world {i}")
  i=i+1
```

```
      hello world 1
      hello world 2
      hello world 3
      hello world 4
      hello world 5
      hello world 6
      hello world 7
      hello world 8
      hello world 9
      hello world 10
```

```
# Sum of Numbers Program using while loop
# Sum : 1 to 10(or any number)

total = 0
i = 1 #i = 2
while i<=10:
  total= total+i
  #total += i
  i=i+1
  #i += i
print(total)
#total=0+1+2+3+4+.....+10
```

```
      55
```

```
# EXERCISE
# Sum of n natural numbers
# ask a user for natural number(n)
# print total from 1 to n

n = input("enter a number : ")
n = int(n)
total = 0
i = 1
while i<=n:
  total += i
  i += 1
print(total)
```

```
      enter a number : 20
      210
```

```
# Problem
# ask user to input a number containing more than one digit
# example - 1256
# calculate 1+2+5+6 and print

# algorithm - (method to solve problem in human language)
```

```
# ask input in string, i.e don't change string to int
# exampe - "1256"
# pick string character one by one and change to int
# int(example[0]) + int(example[1]).... go upto len(example) - 1

number = input("enter a number ")
# "1256" # length=4, last index = 3
# int(number[i])

total = 0
i = 0
while i < len(number):
  total += int(number[i])
  i += 1
print(total)
```

```
    enter a number 1256
    14
```

```
# EXERCISE
# ask a user for name
# example --> Harshit Vashisth
# print count of each word
# output:
# H : 1
# a : 2
# r : 1
# s : 3
# h : 3
# i : 2
# t : 2
#   : 1
# V : 1

name = input("please enter your name ")
# harshit vashisth

# harshit
# name.count("h") , name.count(name[0]) = 2
# name.count("a") , name.count(name[1]) = 1
# name.count("r") , name.count(name[2]) = 1
# name.count("s") , name.count(name[3]) = 1
# name.count("h") , name.count(name[4]) = 2
# name.count("i") , name.count(name[5]) = 1
# name.count("t") , name.count(name[6]) = 1

# output:
# h : 2
# a : 1
# r : 1
# s : 1
# h : 2
# i : 1
# t : 1

i = 0
while i < len(name):
  print(f"{name[i]} : {name.count(name[i])}")
  i += 1
```

```
    please enter your name harshit
    h : 2
    a : 1
    r : 1
    s : 1
    h : 2
    i : 1
    t : 1
```

```
name = input("please enter your name ")
temp_var = ""  # temporary variable
i = 0
while i < len(name):
  if name[i] not in temp_var:
    temp_var += name[i]
```

```
    print(f"{name[i]} : {name.count(name[i])}")
  i += 1
    please enter your name Harshit Vashisth
    H : 1
    a : 2
    r : 1
    s : 3
    h : 3
    i : 2
    t : 2
      : 1
    V : 1
```

```
name = input("please enter your name ")
temp_var = ""  # temporary variable
i = 0
while i < len(name):
  if name[i] not in temp_var:
    temp_var += name[i]
    print(f"{name[i]} : {name.count(name[i])}")
  i += 1

    please enter your name Harshit Vashisth
    H : 1
    a : 2
    r : 1
    s : 3
    h : 3
    i : 2
    t : 2
      : 1
    V : 1
```

```
# Infinite loop
i = 0
while i <= 10:
  print("Hello world")
  i += 1 # if we do not type i += 1 then it will be infinite loop

    Hello world
    Hello world
    Hello world
    Hello world
    Hello world
    Hello world
    Hello world
    Hello world
    Hello world
    Hello world
    Hello world
```