bitwise operators

In [3]:
```
print(0b1100)
```

```
12
```

In [5]:
```
print(bin(12))
```

```
0b1100
```

In [7]:
```
~10
```

Out[7]:
```
-11
```

In [11]:
```
~23
```

Out[11]:
```
-24
```

In [13]:
```
~189
```

Out[13]: -190

In [15]:
```
12 & 13
```

Out[15]: 12

In [17]:
```
12 | 13
```

Out[17]: 13

In [19]:
```
12 ^ 13
```

Out[19]: 1

In [21]:
```
10<<1
```

Out[21]: 20

In [23]:
```
10>>1
```

Out[23]: 5

In [25]:
```
10>>2
```

Out[25]: 2

In [27]:
```
10<<2
```

Out[27]: 40

math fuctions

In [30]:
```
sqrt(25)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[30], line 1
----> 1 sqrt(25)

NameError: name 'sqrt' is not defined
```

In [32]:
```
import math
math.sqrt(25)
```

Out[32]: 5.0

In [34]:
```
math.floor(3.5)
```

Out[34]: 3

In [36]:
```
math.ceil(3.5)
```

Out[36]: 4

In [38]:
```
math.e
```

Out[38]: 2.718281828459045

In [40]:
```
math.pi
```

Out[40]: 3.141592653589793

In [42]:
```
import math as m
m.sqrt(16)
```

Out[42]: 4.0

In [52]:
```
from math import floor, ceil, sqrt
print(floor(3.14))
print(ceil(3.14))
print(sqrt(16))
```

```
3
4
4.0
```

In [54]:
```
from math import *
print(floor(2.8))
print(pow(3,2))
```

```
2
9.0
```

user input function in python | commandline input

In [60]:
```
x = input()
```

In [62]:
```
type(x)
```

Out[62]: str

In [68]:
```
a = input('enter first number')
b = input('enter second number')
c = a + b
d = int(a) + int(b)
print(c)
print(d)
```

```
54
9
```

In [72]:
```
a = input("enter a character")
a
```

Out[72]: 'r'

In [76]:
```
a = eval(input('enter an expression'))
a
```

Out[76]: 60

In [100…
```
a = int(input('enter an integer'))
a
```

Out[100… 4

In [90]:
```
a,b = input('enter two values').split()
print(a)
print(b)
print(a+b)
```

```
2
3
23
```

In [96]:
```
a,b = input('enter two values').split(',')
print(a)
print(b)
print(a+b)
```

```
2
3
23
```

In [108…
```
a, b = map(int, input('Enter two integers: ').split(','))
print(a)
print(b)
print(a + b)
```

```
2
3
5
```

In [114…
```
a, b = (int(x) for x in input('enter two integers').split())
a+b
```

Out[114… 5

In [132…
```
#list of numbers
nums = [int(x) for x in input('enter numbers').split()]
nums
```

Out[132… [1, 2, 4, 2, 5, 3, 4, 6, 4, 7]

In [134…
```
nums[1]
```

Out[134… 2

In [138…
```
nums[3] = 9
nums
```

Out[138… [1, 2, 4, 9, 5, 3, 4, 6, 4, 7]

In [140…
```
#tuple of numbers
nums = tuple((int(x) for x in input('enter numbers').split()))
nums
```

Out[140… (2, 1, 4, 3, 4, 3, 5, 3)

In [142…
```
nums[1]
```

Out[142… 1

In [144…
```
nums[3] = 9
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[144], line 1
----> 1 nums[3] = 9

TypeError: 'tuple' object does not support item assignment
```

In [120…
```
#set of numbers
nums = {int(x) for x in input('enter numbers').split()}
nums
```

Out[120… {1, 2, 3, 4, 5, 6, 7}

In [124…
```
nums[0]
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[124], line 1
----> 1 nums[0]

TypeError: 'set' object is not subscriptable
```

In [128…
```
nums[0] = 0
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[128], line 1
----> 1 nums[0] = 0

TypeError: 'set' object does not support item assignment
```

In [148…
```
user_input = input("Enter a string: ")
print(user_input.upper())
```

```
JAYESH
```

In [162…
```
text = input("Enter a string: ")
vowels = "aeiou"
count = sum(1 for char in text if char.lower() in vowels)
print("Number of vowels:", count)
```

```
Number of vowels: 2
```

In [166…
```
# palindrome
text = input("Enter a string: ")
if text == text[::-1]:
    print("Palindrome")
else:
    print("not palindrome")
```

```
Palindrome
```

In [195…
```
num = int(input("Enter a number: "))
if num > 1:
    for i in range(2, num):
        if num % i == 0:
            print("Not a prime number")
            break
```

```
    else:
        print("Prime number")
else:
   print("Not a prime number")
```

```
Prime number
```

In [197…
```
name = input("Enter your name: ")
age = int(input("Enter your age: "))
print(f"Hello, {name}. You are {age} years old.")
```

```
Hello, JAYESH. You are 1000 years old.
```

In [199…
```
num = int(input("Enter a number: "))
factorial = 1
for i in range(1, num + 1):
    factorial *= i
print("Factorial:", factorial)
```

```
Factorial: 6
```

In [209…
```
user_input = input("Enter something: ").strip()         #removes leading and trailing white spaces
if not user_input:
    print("Input cannot be empty.")
else:
    print(f"You entered: {user_input}")
```

```
You entered: JAYESH
```

In [211…
```
user_input = input("Enter something: ").lower()
user_input
```

Out[211…
```
'jayesh'
```

In [215…
```
import math
num = int(input("Enter a number: "))
if math.isqrt(num) ** 2 == num:                          # isqrt() return integer square root of a number
    print("Perfect square")
else:
    print("Not a perfect square")
```

```
Not a perfect square
```

In [219…
```
import math
num = int(input("Enter a number: "))
print(math.sqrt(num))
print((math.sqrt(num)**2))
```

```
2.23606797749979
5.000000000000001
```

In [223…
```
year = int(input("Enter a year: "))
if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0):
    print("Leap year")
else:
    print("not a leap year")
```

```
Leap year
```

In [225…
```
try:
    num = int(input("Enter a number: "))
except ValueError:
    print("Invalid input! Please enter a valid integer.")
```

```
Invalid input! Please enter a valid integer.
```

In [227…
```
try:
    num = int(input("Enter a number: "))
except ValueError:
    print("Invalid input! Please enter a valid integer.")
```

```
Invalid input! Please enter a valid integer.
```

In [229…
```
try:
    num = int(input("Enter a number: "))
except ValueError:
    print("Invalid input! Please enter a valid integer.")
```

In [1]:
```
text = input("Enter a string: ")
char = input("Enter a character to count: ")
print(f"Occurrence of {char}: {text.count(char)}")
```

```
Occurrence of s: 2
```

In [5]:
```
user_input = input("Enter a string: ").lower()
```

```
user_input
```

Out[5]: 'jayesh s'

In [7]:
```
num = int(input("Enter a number: "))
if num % 10 == 0:
    print("Multiple of 10")
else:
    print("Not a multiple of 10")
```

```
Not a multiple of 10
```

In [9]:
```
user_input = input("Enter a string: ")
if user_input.isalpha():
   print("Only alphabets")
else:
   print("Contains non-alphabet characters")
```

```
Contains non-alphabet characters
```

In [11]:
```
text = input("Enter a sentence: ")
print("Number of words:", len(text.split()))
```

```
Number of words: 4
```

In [19]:
```
from datetime import datetime
date_str = input("Enter a date (YYYY-MM-DD): ")
date = datetime.strptime(date_str, "%Y-%m-%d")
print("Entered date:", date)
```

```
Entered date: 2025-03-22 00:00:00
```

In [17]:
```
from datetime import datetime
date_str = input("Enter a date (DD-MM-YYYY): ")
date = datetime.strptime(date_str, "%d-%m-%Y")
print("Entered date:", date)
```

```
Entered date: 2025-03-22 00:00:00
```

In [21]:
```
num = int(input("Enter a number: "))
if num % 3 == 0 and num % 5 == 0:
    print("Divisible by both 3 and 5")
```

```
else:
    print("Not divisible by both 3 and 5")
```

```
Not divisible by both 3 and 5
```

In [23]:
```
a = input("Enter first value: ")
b = input("Enter second value: ")
a, b = b, a
print(f"Swapped values: a = {a}, b = {b}")
```

```
Swapped values: a = 9, b = 6
```

In [25]:
```
user_input = input("Enter a string: ")
print(user_input.replace(" ", ""))
```

```
mynameisjayesh
```

In [35]:
```
import re                                                    # Imports re for regular expressions.
email = input("Enter email: ")
if re.match(r"[^@]+@[^@]+\.[^@]+", email):
    print("Valid email")
else:
    print("Invalid email")                                    # for strict validation use 'email-validator' library
```

```
Valid email
```

In [37]:
```
names = input("Enter names separated by commas: ").split(',')
print(names)
print(type(names))
```

```
['jayesh', 'mahesh', 'suresh', 'jiyesh']
<class 'list'>
```

In [45]:
```
import re
text = input("Enter a string: ")
numbers = re.findall(r'\d+', text)
print("Extracted numbers:", numbers)
# converting numbers in string format to integers
numbers = [int(num) for num in numbers]
print("Extracted numbers:", numbers)
```

```
Extracted numbers: ['35', '30']
Extracted numbers: [35, 30]
```

In [47]:
```
numbers = list(map(int, input("Enter numbers separated by spaces: ").split()))
print("Maximum number:", max(numbers))
```

```
Maximum number: 9
```

In [52]:
```
while True:
    try:
        num = int(input("Enter a valid number: "))
        break
    except ValueError:
        print("Invalid input, please enter a number.")
```

```
Invalid input, please enter a number.
```

In [54]:
```
user_input = input("Enter a string: ")
if any(char.isdigit() for char in user_input):
    print("Contains digits")
else:
    print("No digits")
```

```
Contains digits
```

In [58]:
```
user_input = input("Enter a string: ")
if user_input.isspace():
    print("Only whitespace")
else:
    print("Contains non-whitespace characters")
```

```
Contains non-whitespace characters
```

In [60]:
```
text = input("Enter a string: ")
digit_sum = sum(int(digit) for digit in text if digit.isdigit())
print("Sum of digits:", digit_sum)
```

```
Sum of digits: 11
```

In [66]:
```
num = int(input("Enter a number: "))
print("Absolute value:", abs(num))
```

```
Absolute value: 4
```

In [68]:
```
user_input = input("Enter a string: ")
if any(char.isupper() for char in user_input):
    print("Contains uppercase letters")
```

```
else:
    print("No uppercase letters")
```

```
Contains uppercase letters
```

In [70]:
```
celsius = float(input("Enter temperature in Celsius: "))
fahrenheit = (celsius * 9/5) + 32
print(f"Temperature in Fahrenheit: {fahrenheit}")
```

```
Temperature in Fahrenheit: 158.0
```

In [72]:
```
numbers = list(map(int, input("Enter numbers separated by space: ").split()))
print("Average:", sum(numbers) / len(numbers))
```

```
Average: 3.75
```

In [74]:
```
text = input("Enter a string: ")
consonants = "bcdfghjklmnpqrstvwxyz"
count = sum(1 for char in text.lower() if char in consonants)
print("Number of consonants:", count)
```

```
Number of consonants: 9
```

In [76]:
```
import string
text = input("Enter a string: ")
if any(char in string.punctuation for char in text):
    print("Contains punctuation")
else:
    print("No punctuation")
```

```
Contains punctuation
```

In [78]:
```
text = input("Enter a sentence: ")
words = text.split()
longest_word = max(words, key=len)
print("Longest word:", longest_word)
```

```
Longest word: jayesh
```

conditional statements

- if
- if else

- if elif else
- nested if

In [82]:
```
if True:
    print('data science')
```

```
data science
```

In [84]:
```
if True:
    print('data science')
    print('spend 3 to 4 hrs')
```

```
data science
spend 3 to 4 hrs
```

In [86]:
```
if False:
    print('data science')
print('good bye')
```

```
good bye
```

In [90]:
```
if True:
    print('data science')
else:
    print('good bye')
```

```
data science
```

In [92]:
```
char = input("Enter a character: ").lower()
if char in 'aeiou':
    print("Vowel")
else:
    print("Consonant")
```

```
Vowel
```

In [94]:
```
num = int(input("Enter a number: "))
if 0 <= abs(num) < 10:
    print("Single-digit number")
else:
    print("Not a single-digit number")
```

```
Single-digit number
```

In [96]:
```
s = input("Enter a string: ")
if not s:
    print("String is empty")
else:
    print("String is not empty")
```

```
String is empty
```

In [98]:
```
import math
num = int(input("Enter a number: "))
if math.isqrt(num) ** 2 == num:
    print("Perfect Square")
else:
    print("Not a perfect square")
```

```
Not a perfect square
```

In [102…
```
math.isqrt(5)                                # isqrt() - integer square root
```

Out[102… 2

In [104…
```
num = int(input("Enter a number: "))
if 1 <= num <= 100:
    print("Within range")
else:
    print("Out of range")
```

```
Within range
```

In [106…
```
day = input("Enter a day: ").lower()
if day in ["saturday", "sunday"]:
    print("Weekend")
else:
    print("Weekday")
```

```
Weekend
```

In [108…
```
a = int(input("Enter first side: "))
b = int(input("Enter second side: "))
c = int(input("Enter third side: "))
if a + b > c and a + c > b and b + c > a:
    print("Valid Triangle")
```

```
else:
    print("Invalid Triangle")
```

```
Valid Triangle
```

In [128…

```
num = int(input('enter a number  :'))
if num > 1:
    for i in range(2, int(num**0.5) + 1):
        if num % i == 0:
            print("Not a prime number")
            break
    else:
        print("Prime number")
else:
    print("Not a prime number")
```

```
Prime number
```

In [132…

```
a = int(input("Enter first side: "))
b = int(input("Enter second side: "))
c = int(input("Enter third side: "))
if a == b == c:
    print("Equilateral Triangle")
elif a == b or b == c or a == c:
    print("Isosceles Triangle")
else:
    print("Scalene Triangle")
```

```
Scalene Triangle
```

In [134…

```
num = input("Enter a number: ")
if num == num[::-1]:
    print("Palindrome")
else:
    print("Not a Palindrome")
```

```
Palindrome
```

In [136…

```
units = int(input("Enter electricity units consumed: "))
if units <= 100:
    bill = units * 5
elif units <= 300:
    bill = (100 * 5) + (units - 100) * 10
else:
```

```
    bill = (100 * 5) + (200 * 10) + (units - 300) * 15
print("Total Bill: ₹", bill)
```

```
Total Bill: ₹ 3175
```

In [138…

```
marks = int(input("Enter marks: "))
if marks >= 90:
    print("Grade: A")
elif marks >= 80:
    print("Grade: B")
elif marks >= 70:
    print("Grade: C")
elif marks >= 60:
    print("Grade: D")
elif marks >= 40:
    print("Grade: E")
else:
    print("Grade: F (Fail)")
```

```
Grade: F (Fail)
```

In [140…

```
import calendar
day = int(input("Enter day: "))
month = int(input("Enter month: "))
year = int(input("Enter year: "))
if 1 <= month <= 12 and 1 <= day <= calendar.monthrange(year, month)[1]:
    print("Valid date")
else:
    print("Invalid date")
```

```
Valid date
```

In [144…

```
num = int(input("Enter a number: "))
num_digits = len(str(num))  # Count the number of digits
sum_of_powers = sum(int(digit) ** num_digits for digit in str(num))

if sum_of_powers == num:
    print(num, "is an Armstrong number")
else:
    print(num, "is NOT an Armstrong number")
```

```
9 is an Armstrong number
```

In [148…
```
a = int(input("Enter first side: "))
b = int(input("Enter second side: "))
c = int(input("Enter third side: "))
d = int(input("Enter fourth side: "))
if a == b == c == d:
    print("Square")
elif a == c and b == d:
    print("Rectangle")
else:
    print("Quadrilateral")
```

```
Quadrilateral
```

In [150…
```
temp = float(input("Enter temperature: "))
unit = input("Enter unit (C/F): ").upper()
if unit == "C":
    print("Fahrenheit:", (temp * 9/5) + 32)
elif unit == "F":
    print("Celsius:", (temp - 32) * 5/9)
else:
    print("Invalid unit")
```

```
Fahrenheit: 32.0
```

In [152…
```
num = int(input("Enter a number: "))
if num > 0 and (num & (num - 1)) == 0:
    print("Power of 2")
else:
    print("Not a Power of 2")
```

```
Power of 2
```

In [154…
```
month = int(input("Enter month (1-12): "))
year = int(input("Enter year: "))
days = [31, 28 + (1 if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0) else 0), 31,
30, 31, 30, 31, 31, 30, 31, 30, 31]
print("Days:", days[month - 1])
```

```
Days: 29
```

In [156…
```
import re
password = input("Enter password: ")
if len(password) >= 8 and re.search(r"[A-Za-z]", password) and re.search(r"\d", password):
```

```
    print("Valid Password")
else:
    print("Invalid Password")
```

```
Valid Password
```

In [158…
```
a, b, c = sorted(map(int, input("Enter three numbers: ").split()))
if a**2 + b**2 == c**2:
    print("Pythagorean Triplet")
else:
    print("Not a Pythagorean Triplet")
```

```
Pythagorean Triplet
```

In [160…
```
def roman_to_int(s):
    roman = {'I': 1, 'V': 5, 'X': 10, 'L': 50, 'C': 100, 'D': 500, 'M': 1000}
    total = 0
    for i in range(len(s)):
        if i > 0 and roman[s[i]] > roman[s[i - 1]]:
            total += roman[s[i]] - 2 * roman[s[i - 1]]
        else:
            total += roman[s[i]]
    return total

num = input("Enter Roman numeral: ").upper()
print("Integer:", roman_to_int(num))
```

```
Integer: 9
```

In [164…
```
month = int(input("Enter birth month (1-12): "))
day = int(input("Enter birth day: "))

zodiac = [("Capricorn", 20), ("Aquarius", 19), ("Pisces", 20), ("Aries", 20),
          ("Taurus", 21), ("Gemini", 21), ("Cancer", 22), ("Leo", 22),
          ("Virgo", 22), ("Libra", 23), ("Scorpio", 23), ("Sagittarius", 22), ("Capricorn", 31)]

sign = zodiac[month - 1][0] if day <= zodiac[month - 1][1] else zodiac[month][0]
print("Zodiac Sign:", sign)
```

```
Zodiac Sign: Gemini
```

In [166…
```
num = int(input("Enter a number: "))
sum_digits = sum(int(digit) for digit in str(num))
if num % sum_digits == 0:
```

```
    print("Harshad Number")                 # number divisible by sum of its digits. also called niven number
else:
    print("Not a Harshad Number")
```

```
Harshad Number
```

In [168…
```
x1, y1 = map(int, input("Enter current position (x y): ").split())
x2, y2 = map(int, input("Enter new position (x y): ").split())

if (abs(x1 - x2), abs(y1 - y2)) in [(2, 1), (1, 2)]:
    print("Valid Knight Move")
else:
    print("Invalid Move")
```

```
Valid Knight Move
```

In [170…
```
income = int(input("Enter monthly income: "))
credit_score = int(input("Enter credit score: "))
employed = input("Are you employed? (yes/no): ").lower()

if income >= 25000 and credit_score >= 700 and employed == "yes":
    print("Loan Approved")
else:
    print("Loan Denied")
```

```
Loan Approved
```

In [175…
```
import random
choices = ["rock", "paper", "scissors"]
user = input("Enter rock, paper, or scissors: ").lower()
computer = random.choice(choices)

print("Computer chose:", computer)
if user == computer:
    print("It's a tie!")
elif (user == "rock" and computer == "scissors") or (user == "scissors" and computer == "paper") or (user == "paper"
    print("You win!")
else:
    print("You lose!")
```

```
Computer chose: rock
It's a tie!
```

In [179…
```
import calendar

day, month, year = map(int, input("Enter date (DD MM YYYY): ").split())

# Get the weekday number (0=Monday, 6=Sunday)
weekday_num = calendar.weekday(year, month, day)

# List of days
days = ["Monday", "Tuesday", "Wednesday", "Thursday", "Friday", "Saturday", "Sunday"]

# Print the result
print("Day of the Week:", days[weekday_num])
```

```
Day of the Week: Wednesday
```

In [181…
```
age = 20
message = 'teenager' if age>=13 and age<=19 else 'not a teenager'
print(message)
```

```
not a teenager
```

In [193…
```
x = -5
assert x > 0, "x should be greater than zero"
print('success')
```

```
---------------------------------------------------------------------------
AssertionError                            Traceback (most recent call last)
Cell In[193], line 2
      1 x = -5
----> 2 assert x > 0, "x should be greater than zero"
      3 print('success')

AssertionError: x should be greater than zero
```

In [197…
```
def divide_numbers(a,b):
    try:
        result = a/b
    except ZeroDivisionError:                          # ZeroDivisionError is a keyword
        print("error: division by zero")
    else:
        print(f"result: {result}")
    finally:
```

```
        print("this block always execute")

divide_numbers(10,2)
divide_numbers(5,0)
```

```
result: 5.0
this block always execute
error: division by zero
this block always execute
```

In [ ]: