check your python preparations from this pack N.3 with Bouzian

Exercice 1: Basic syntax and in;ut/output

1. write a program that asks the user for their first name and last name, then prints:

Boujour `fist name` `last name` !

In [ ]:
```
first_name = input('enter your first name: ')
last_name = input('enter your last name: ')

print(f'Boujour {first_name} {last_name} ')
```

2. write a program that calculates the area fo a circle. ask the user for the radius and use the formula: Area = π * r^2

In [ ]:
```
import math
radius = float(input('enter the value of the radius: '))

area = math.pi * radius ** 2

print('the area of the circle is {:.2f}'.format(area))
```

3. write a program that asks the user for their heiht (in meters) and weight (in kilograms), then calculates and prints their BMI (Body Mass Index)

In [ ]:
```
height = float(input('enter your height: '))
weidth = float(input('enter your weidth: '))

BMI = weidth / (height * height)

print(f'the body mass index is {BMI}')
```

Exercice 2 : calculations and operators

1. Write a program that calculates the compound interest using the formula:

A = P * (1 + r/n)^(n*t)

Where:

- P = principal amount (ask the user)
- r = annual interest rate (ask the user)
- n = number of times interest is compounded per year (ask the user)
- t = time in years (ask the user)

In [ ]:
```
P = float(input('enter the principal amount: '))
r = float(input('enter the annual interest rate: '))
n = int(input('enter the number of times in interest is compounded per years: '))
t = int(input('enter the time in years'))

A = P * (1 + r/n) ** (n * t)

print(f'the compound interst is {A}')
```

2. write a program that converts a binary number to its dicimal equivalent.

In [6]:
```
binary_num = "100101"

dic_num = int(binary_num, 2)
print(f'{binary_num} is {dic_num} in decimal number')
```

```
100101 is 37 in decimal number
```

3. write a program that calculates the roots of a quadratic equation.

In [ ]:
```
import math

a = int(input('enter the a value: '))
b = int(input('enter the b value: '))
c = int(input('enter the c value: '))

delta = b**2 - 4*a*c

x1 = (-b + math.sqrt(delta))/2*a
x2 = (-b - math.sqrt(delta))/2*a
print(f'the solutions of the equation are {x1, x2 }') # try in your code to get just two numbers after the "."
```

Exercice 3: conditionals (if/else)

1. write a program that asks the user for three numbers and prints them in ascending order

In [ ]:
```
num1 = int(input('enter the first number: '))
num2 = int(input('enter the second number: '))
num3 = int(input('enter the therd number: '))

numbers = [num1, num2, num3]

numbers.sort()
print(numbers)
```

2. write a program that checks if a year entered by the user is leap year. a leap year is divisible by 4 but not by 100 unless it is also divisible by 400.

In [ ]:
```
year = int(input('enter a year to ckeck: '))

if (year % 4 == 0 and year % 100 != 0) or year % 400 == 0:
    print(f"{True} {year} is a leap year")
```

```
else :
    print(f"{False} {year} is not a leap year")
```

3. Write a program that simulates a simple login system. Ask the user for a username and password. If the username is "admin" and the password is "1234", print "Accès autorisé." Otherwise, print "Accès refusé."

In [ ]:
```
username = input('enter uour username: ')
password = input('enter your password: ')

if username == "admin" and password == "1234":
    print("Accès autorisé.")
else:
    print("Accès refusé.")
```

Exercice 4 : Loops (for/while)

1. write a program that prints the first 10 prime numbers.

In [23]:
```
first_10_prime = []
num = 2

while len(first_10_prime) < 10:
    is_prime = True
    for j in range(2, int(num ** 0.5) + 1):
        if num % j == 0:
            is_prime = False
            break
    if is_prime:
        first_10_prime.append(num)
    num += 1

print(first_10_prime)
```

```
[2, 3, 5, 7, 11, 13, 17, 19, 23, 29]
```

2. write a program tha uses a while loop to find the smallest nuber divisible by both 7 and 11.

In [ ]:
```
number = 1 # we start with 1

while True:
    if number % 7 == 0 and number % 11 == 0: # check if the number is divisble by both 7 and 11
        break # this condition if true the loop must to break
    number += 1 # we add 1 to the number to repeat the loop

print(f'the smallest number divisible by both 7 and 11 is {number}')
```

3. write a program that prints the following pattern using nested loops:

1

22

333

4444

55555

In [43]:
```
for i in range(1, 6):
    for j in range(i):
        print(i, end="")
    print()
```

```
1
22
333
4444
55555
```

4. Write a program that simulates a guessing game. The program generates a random number between 1 and 100, and the user has to guess it. Provide hints like "Too high" or "Too low" until the user guesses correctly.

In [5]:
```
from random import randint
```

```
computer_guessing = randint(1, 10) # generate a random number between 1 and 10
user_guessing = int(input('guess a number: ')) # promp a number from the user

while True:
    if computer_guessing == user_guessing:
        print(f'Congratulations! You got it right. The number was {computer_guessing}')
        break # if the user number equal to the computer number  break from the loop
    if computer_guessing > user_guessing:
        print('too low, repeat')
        user_guessing = int(input('guess a number: '))  # repeat if the user number less then computer number

    if computer_guessing < user_guessing:
        print('too hight, repeat')
        user_guessing = int(input('guess a number: ')) # repeat if the user number greater then computer number


    user_guessing = int(input('guess a number: '))
```

```
too low, repeat
too hight, repeat
congractulation you got it 6
```

Exercice 5: strings

1. write a progrm that ask the user for a sentencde and counts the number of words in it.

In [ ]:
```
sentence = input('enter a sentence: ') # prompt a sentence from the user

sentence = sentence.strip().split() # split the sentence and convert it to a list to present each word
word_count = 0
for word in sentence:
    word_count += 1 # loop on each word and add 1 to the words counter

print(f'the number of words in your sentence is {word_count}')
```

2. write a program tha checks if a string entered by the user is a pangram (contains every letter of the alphabet at least once)

In [ ]:
```
import string
String = input('enter a string to check: ').lower()

alphabet = set("abcdefghijklmnopqrstuvwxyz")

pangram = alphabet.issubset(set(String))

if pangram:
    print('the string is pangram')
else:
    print('the sentence is not pangram ')
```

3. Write a program that capitalizes the first letter of each word in a sentence entered by the user.

In [ ]:
```
sentence = input('enter a string: ')

sentence = sentence.strip().split() # split each word of the string
sentence_cap = [] # initial an empty list to containes capitalize words
for w in sentence:
    w_cap = w.capitalize() # we use the capitalize methode
    sentence_cap.append(w_cap) # add the capitalized word to the empty list

print(f'the capitalization of the first letter of each word is {" ".join(sentence_cap)}') # the join method convert c
```

Exercice 6 : Lists

1. write a program that creates a list of 10 random numbers between 1 and 100 and prints:
   - the list
   - the sum of the numbers
   - the largest and smallest numbers.

In [ ]:
```
from random import randint
num_list = []
for n in range(10):
    n = randint(1, 100)
```

```
    num_list.append(n)

# print the list
print(num_list)

# the sum of the numbers

print(sum(num_list))

# the largest and the smallest numbers

print(f'the largest number is {max(num_list)} and the smallest is {min(num_list)}')
```

2. write a program that removes all duplicates elements form a list and prints the updated list.

In [18]:
```
products = ['apple', 'juis', 'milk', 'butter', 'butter', 'apple']

# remvoe all duplicates elements

remove_dup = list(set(products))

print(f'the updated list is {remove_dup}')
```

```
the updated list is ['apple', 'juis', 'milk', 'butter']
```

4. write a progrma that simulate a lottery. Generate a list of 6 random numbers between 1 and 94 (no duplicates) and print them in ascending order

In [20]:
```
from random import randint
list_num = []

for n in range(6):
    n = randint(1, 50)
    list_num.append(n)
# print them in ascending order

list_num.sort()
print(f'the sorted list in ascending order is {list_num}')
```

```
[3, 6, 11, 20, 27, 30]
```

5. write a program that checks if two lists are anagrams of each other (contain the same elements but in a different order)

In [ ]:
```python
list1 = [23, 33, 32, 43]
list2 = [32, 35, 43, 45] # list 2 should return false
list3 = list(reversed(list1)) # this list now should return true

if sorted(list1) == sorted(list3):
    print(f'{True} the two lists are anagrams of each other')
else:
    print(f"{False} the two lists are not anagrams of each other.")
```

In [ ]:
```python

```