Python exercices pack N.2 with Bouzian

Exercice 1: basic syntax and input/output

1. write a program that asks the user for their favorite color and prints: Votre couleur prefere est [color]

In [ ]:
```
fav_color = input("c'est quoi votre prefer coleur: ")

print("votre prefer coleur est {}".format(fav_color))
```

2. wrte a progra that calculates the preimeter of a square. ask the user for the lengeht of one side.

In [ ]:
```
length = float(input('what is the length of one side: '))

perimetre = length * 4
print('the perimetre of the square is {}'.format(perimetre))
```

3. wirte a programthat askd the user for their birth year and calculates their age:

In [ ]:
```
birth = int(input("enter your birth: "))
age = 2025 - birth
print(f"from your birth input you have {age} years old.")
```

Exercice 2 : calcualtions and operators

1. write a program that calculates the volume of a sphere:

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

```
volume = (4/3) * math.pi * r**3
print('the volume of the sphere is {:.2f}'.format(volume))
```

2. write a program that converts a distance from kilometers to miles:

In [ ]:
```
dis_kilo = float(input('enter the distance you want to convert from kilometer to mile:  '))

dis_con = dis_kilo * 0.621371
print("the distance on miles is {:.2f}".format(dis_con))
```

3. wrtie a program that calculates the hypotenuse of a right triangle eusing the pythagoream theorem:
   - Hypotenuse = $\sqrt{(a^2 + b^2)}$

In [ ]:
```
import math
print("enter hte length of the two sides a and b")
a = float(input('enter the a value: '))
b = float(input('enter the b value: '))

hypotenuse = math.sqrt(a**2 + b**2)
print("the hypotenuse of the triangle is {:.2f}".format(hypotenuse))
```

Exercice 3 : conditionals (if/else)

1. write a program that asks the user for a number and check if it is deivisible by both 3 and 5

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

if number % 3 == 0 and number % 5 == 0 :
    print(True)
else :
    print(False)
```

2. wrtie a program that asks the user for their grad (0-20) and prints:

- "Très bien" if the grade is 16 or higher.
- "Bien" if the grade is between 14 and 15.
- "Assez bien" if the grade is between 12 and 13.
- "Passable" if the grade is between 10 and 11.
- "Insuffisant" if the grade is below 10.

In [ ]:
```
grade = float(input('enter your grade (0-20) : '))

if grade > 16:
    print('Tres bien')
elif grade in range(14, 15 + 1):
    print('Bien')
elif grade in range(12, 13 + 1): # the + 1 because the second argument of the range function is exclusive
    print('Assez bien')
elif grade in range(10, 11 + 1):
    print('Passable')
else :
    print("Insufissant")
```

3. wrtie a program that asks th user for three numbers and prints the largest one

In [ ]:
```
print("print three numbers: ")

three_numbers = []
for n in range(3):
    n = int(input('>>>'))
    three_numbers.append(n) # here after we receive the number from the user we adding it directly to the list

print(f"the largest number you printed is {max(three_numbers)}")
```

Exercice 4: loops (for/while)

1. write a program that prints all even numbers between 1 and 50 using a for loop

In [ ]:
```
for n in range(1, 50):
    if n % 2 == 0:
        print(n)
```

2. write a program that uses a while loop to calculate the factoriel of a number entered by the user.

In [ ]:
```
num = int(input('enter a number: '))
fact = 1
i = 1

while i <= num:
    fact *= i
    i += 1

print(fact)
```

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

In [25]:
```
n = int(input('enter the number of rows: '))

for i in range(1, n + 1):
    for j in range(1, i + 1):
        print("*", end="")
    print()
```

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

Exercice 5: Strings

1. write a program that asks the user for a sentence and counts the number of vowels (a, e, i, o, u) in it

In [ ]:
```
string = input('enter a text to count the numebr of vowels in it: ')

vowels = ['a', 'e', 'i', 'o', 'u']
vowels_count = 0
for c in string: # we loop on each letter in the text
    if c in vowels: # we check if c the letter is vowel or not
        vowels_count += 1 # if the c is in vowels list we add 1 to the vowel counter

print(f'the number of vowels in your text is {vowels_count}')
```

2. wrtie a program that asks the user for a word and check if it starts with a vowel.

In [ ]:
```
word = input('enter a word: ')
vowels = ['a', 'e', 'i', 'o', 'u']

if word[0] in vowels:
    print(True)
else:
    print(False)
```

3. wrtie a program that replaces all spaces in a sentence with underscores.

In [46]:
```
sentence = input('enter a sentence to check : ')

sentence = [c for c in sentence] # this is a list comprehension, store each character into this list

for i in range(0, len(sentence)):
    if sentence[i] == " ": # check each index if its value equat to a space
        sentence[i] = "_" # if true replace it by a underscore

sentence_replaced = "".join(sentence) # convert the list into str

print(sentence_replaced)
```

do_it_now_

Exercice 6 : Lists

1. wrtie a program that creates a lsit of 10 random numbers between 1 and 100 and prints:
   - the list
   - the average of the numbers

In [49]:
```python
import random # this librari we will use it to return random number

numbers_random = []
for n in range(11):
    n = random.randint(1, 100) # returnh a random number between 1 and 100
    numbers_random.append(n)

# print the list
print(numbers_random)

# the average of the numbers
average = sum(numbers_random)/len(numbers_random)
print('the average of the nmbers is {:.2f}'.format(average))
```

```
[14, 53, 71, 44, 3, 1, 19, 1, 93, 97, 75]
the average of the nmbers is 42.82
```

2. write a program that asks the user for 5 numbers, stores them in a list, and prints the list in reverse order.

In [50]:
```python
print("print 5 numbers: ")

numbers = [] # empty list to store the numbers

for i in range(5):
    i = int(input('>>>'))
    numbers.append(i) # store each number to the empty list

numbers_reverse = list(reversed(numbers))
print(f'the reversed numbers list is {numbers_reverse}')
```

```
print 5 numbers:
the reversed numbers list is [3, 33, 43, 53, 33, 34]
```

3. write a program that removes all negative numbers from a list and prints the updated list.

In [51]:
```
numbers = [12, -4, 5, -65, 65, -6534]

for n in numbers:
    if n < 0:
        numbers.remove(n)

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

```
the updated list is [12, 5, 65]
```

4. wrtie a program that merges two lists into one and prints the compined list

In [52]:
```
list1 = [123,32 ,234, 23]
list2 = [33, 3, 543, 543]

list3 = list1 + list2
print(f'the compined list is {list3}')
```

```
the compined list is [123, 32, 234, 23, 33, 3, 543, 543]
```

5. write a progrma that finds and prints the index of a specific element in a list. if the element is not found, print "element non trouve"

In [5]:
```
# set the elements as a students names
students = ['hamza', 'hassan', 'mohemmed', 'ahmed']

spe_element = input('enter a specific element to find its index in the list: ')

if spe_element in students:
    index_spe_element = students.index(spe_element)
    print(f'the index of the spercific element is {index_spe_element}')
else:
    print('element non trouve')
```

```
element non trouve
```