Task 6 - Logical programming Operators

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Question 1

Compulsory Task 1

Follow these steps:

- Create a new Python file in this folder called **task1.py**.
- Declare three variables called *num1*, *num2* and *num3*. Assign each variable a number value.
- Now, compare *num1* and *num2* and display the larger value.
- Next, determine whether *num1* is odd or even and display the result.
- Next, write a conditional statement to sort the three numbers from largest to smallest.

Solution 1

In [531]:

```
#num1 variable store value of 10
num1 = 10
#num2 variable store value of 20
num2 = 20
#num3 variable store value of 30
num3 = 30

#if statement, num2 is greater than equal to num1
if num2>=num1:
    print("\nnum2 is greater than num1")
#else statement if num1 is greater than num2
else:
    print("\nnum1 is greater than num2")
#if statement, number is even number
if num1%2 == 0:
    print("\nnum1 is an Even number")
#else statement, if number is odd
else:
    print("\nnum1 is  an Odd number")
```

```
num2 is greater than num1

num1 is an Even number
```

In [533]:

```
#user input varibale are num1, num2 and num3
#input()built-in function has been used
#int() built-in function has been used for denoting specific value to store
num1 = int(input("Enter num1: "))
num2 = int(input("Enter num2: "))
num3 = int(input("Enter num3: "))

#def function has been used due to re-use property
#num1,num2 and num3 are declared parameter in function
def numplay(num1, num2, num3):
#if statement if num is greater than equal to num2 and  num1 greater than equal to num3
    if num1>=num2 and num1>=num3:
        #if num2 is greater than equal to  num3
        if num2>=num3:
                print("\nnum1 is the first largest number",num1)
                print("\nnum2 is the second largest number", num2)
                print("\nnum3 is the third lowest number", num3)
#if statement num2 is greater than equal to num1, and num2 is greater and equal to num3
    if num2>=num1 and num2>=num3:
        #if num3 is greater and equal to num1
        if num3>=num1:
                print("\nnum2 is the first largest number",num2)
                print("\nnum3 is the second largest number", num3)
                print("\nnum1 is the lowest  number", num1)
#if statement num3 is greater than equal to num3 is greater than equal to  num2
    if num3>=num1 and num3>=num2:
        #if num3 is greater than equal to num3 and num2 is greater than num1
        if num3>=num2 and num2>nuam1:
                print("\nnum3 is the first largest number", num3)
                print("\nnum2 is the second largest number",num2)
                print("\nnum1 is the lowest number", num1)
#if statement num1 is greater than equal to num2 and num1 is greater than equal to num3
    if num1>=num2 and num1>=num3:
        #if num2 is less than equal to num3
        if num2<=num3:
                print("\nnum1 is the first largets number", num1)
                print("\nnum3 is the second largest number",  num3)
                print("\nnum2 is the lowest number",num2)
#if statement num2 is greater than equalto num1,and num2 is greater than equal to num3
    if num2>=num1 and num2>=num3:
        #if num1 is greater than equal to num3 and num3 is less than qual to num2
        if num1>=num3 and num3<=num2:
                print("\nnum2 is the first largest number", num2)
                print("\nnum1 is the second largest number", num1)
                print("\nnum3 is the lowest number", num3)
#if statement, num3 is greater than equal to num2 and num1 is greater than equal to num2
    if num3>= num2 and num1>=num2:
        #if statement, num1 is less than equal to num3 and num1 is greater than equal to num2
        if num1<=num3 and num1>=num2:
            print("\nnum3 is the first largest number", num3)
            print("\nnum1 is the second largest number", num1)
            print("\nnum2 is the lowest  number",num2)
#functional call
numplay(num1, num2, num3)
```

```
Enter num1: 10
Enter num2: 20
Enter num3: 30

num3 is the first largest number 30
```

```
num2 is the second largest number 20

num1 is the lowest number 10
```

In [248]:
```
print("num1 = 10, num2 = 20, and num3 = 30\n")
a = numplay(10,20,30)
print("\n----------------------------------")
print("num1 = 10, num2 = 30, and num3 = 20\n")
b = numplay(10,30,20)
print("\n----------------------------------")
print("num1 = 20, num2 = 10, and num3 = 30\n")
c = numplay(20,10,30)
print("\n----------------------------------")
print("num1 = 20, num2 = 30, and num3 = 10\n")
d = numplay(20,30,10)
print("\n----------------------------------")
print("num1 = 30, num2 = 20, and num3 = 10\n")
e = numplay(30,20,10)
print("\n----------------------------------")
print("num1 = 30, num2 = 10, and num3 = 20\n")
f = numplay(30,10,20)
print("\n----------------------------------")
```

```
num1 = 10, num2 = 20, and num3 = 30

num3 is the first largest number 30
num2 is the second largest number 20
num1 is the lowest number 10

----------------------------------
num1 = 10, num2 = 30, and num3 = 20

num2 is the first largest number 30
num3 is the second largest number 20
num1 is the lowest  number 10

----------------------------------
num1 = 20, num2 = 10, and num3 = 30

num3 is the first largest number 30
num1 is the second largest number 20
num2 is the lowest  number 10

----------------------------------
num1 = 20, num2 = 30, and num3 = 10

num2 is the first largest number 30
num1 is the second largest number 20
num3 is the lowest number 10

----------------------------------
num1 = 30, num2 = 20, and num3 = 10

num1 is the first largest number 30
num2 is the second largest number 20
num3 is the third lowest number 10

----------------------------------
num1 = 30, num2 = 10, and num3 = 20

num1 is the first largets number 30
num3 is the second largest number 20
num2 is the lowest number 10

----------------------------------
```

Question 2

Compulsory Task 2

Follow these steps:

- Create a new Python file in this folder called **task2.py**.
- This program will be used to calculate the area that the foundation of a building covers. This program should:
    - Ask the user to enter the shape of the building (square, rectangular or round).
    - Based on the user's input, prompt for the appropriate dimensions. See what dimensions you need in the list of formulae below.
    - Calculate and display the area that will be taken up by the foundation of the building.
- Formulae for area:
    - Area of square = length of the square to the power of two (length^2).
    - Area of rectangle = length x width.
    - Area of circle = pi x radius squared (πradius^2).

Answer 2

In [315]:

```python
#user will input three specific word at a time, "square","rectangle", and "round"
#if user input square, it  will follow the path of square if statement for calculating area
#if user input rectangle, it will follow the path of rectangle  if statement for calculating area
#if user input round, it will follow the path of round, if statement for calculating circle
user_input = str(input("Enter any one \"square\", \"rectangle\", or \"round\" :" ))

#if statement for square
#it will compare string "square" and if it True, it will ask user to input l value
if user_input == "square":
    #l stand for length of square
    l = float(input("\nInput:\nEnter length for square: "))
    #def function for re-usibility
    def square(l):
        area = l**2 #area  of square
        return area #value return to caller
    result = square(l) #function square call and saved in variable result
    #f-string for presenting value and projecting varible "square_solution"
    print(f"\nOutput:\nArea of square: {result}")

#if statement for rectangle
#it will compare string "rectangle" and if it True, it will ask user to input l and w value
if  user_input == "rectangle":
    #l stand for length
    #w stand for width
    l = float(input("\nInput:\nEnter length for rectangle: "))
    w = float(input("Enter width for rectangle: "))
    def rectangle(l,w):
        area= l*w #area of rectangle
        return area #valuereturn to caller
    result  = rectangle(l,w) #function rectangle call and saved in varibale result
    print(f"\nOutput:\nArea of rectangle: {result}")


#if statement for rectangle
#it will compare string "round" and if it True, it will ask user to input r value
if user_input == "round":
    #importing library
    import math
    #changing math.pi to pie
    pie = math.pi #stroing math.pie into pie
    r = float(input("\nInput:\nEnter the radius of circle: "))
    def circle(r):
        area = pie*(r**2) #area of circle
        return area
    result = circle(r) #storing into variable result
    print(f"\nOutput:\nArea of circle: {round(result,2)}")
```

```
Enter any one "square", "rectangle", or "round" :rectangle

Input:
Enter length for rectangle: 10
Enter width for rectangle: 20

Output:
Area of rectangle: 200.0
```

```
In [316]: square(2)
```

```
Out[316]: 4
```

```
In [318]: rectangle(40,50)
```

```
Out[318]: 2000
```

```
In [319]: circle(50)
```

```
Out[319]: 7853.981633974483
```

Question 3

Compulsory Task 3

Follow these steps:

- Create a new Python file in this folder called **task3.py**.
- Design a program that determines the award a person competing in a triathlon will receive.
- Your program should read in the times in minutes for all three events of a triathlon, namely swimming, cycling, and running, and then calculate and display the total time taken to complete the triathlon.
- The award a participant receives is based on the total time taken to complete the triathlon. The qualifying time for awards is 100 minutes. Display the award the participant will receive based on the following criteria:

Total time	**Award**
Within qualifying time.	Provincial Colours
Within 5 minutes of qualifying time.	Provincial Half Colours
Within 10 minutes of qualifying time.	Provincial Scroll
More than 10 minutes of qualifying time.	No award

Answer 3

In [530]:

```python
#User input for swiming time, cycling time, and running time
#float()  buil-in function is used in input and input() built-in function has been used
swiming =  float(input("Enter swiming time: "))
cycling = float(input("Enter cycling time: "))
running = float(input("Enter running time: "))

#total of triathlon activity
#"user_time" variable store total value from addition operation of swiming, cycling and running
user_time = swiming+cycling+running
#qualifying time has declared to 100, "time"varibale store value of 100
time = 100

#if statement for comparing between "user_time" variable which is overall activity to "time" varibale
#if player user_time is equal to time, than statement is true and print "Provincial Colours"
if user_time <= time:
    print("\nProvincial Colours")

#elif statement for comapring "user_time" variable and 5 minutes of qualifying time
#print will be "Half Provincial Colours"
elif user_time == (time-5):
    print("\nProvincial Half Colours")

#elif statement for comapring "user_time" variable and 10 minutes of qualifying time
#print will be "Half Provincial Scroll"
elif user_time == (time-10):
    print("\nProvincial Scroll")

#elif statement for comapring "user_time" variable is greater than "time" varibale
#print will be "No award"
elif user_time>time:
    print("\nNo award")
```

```
Enter swiming time: 10
Enter cycling time: 10
Enter running time: 80

Provincial Colours
```

Question 4

Compulsory Task 4

Follow these steps:

- Create a new Python file in this folder called **task4.py**.
- Create a program that asks the user to enter an integer and determine if it is:
    - divisible by 2 and 5,
    - divisible by 2 or 5,
    - not divisible by 2 or 5

- Display your result.

Answer 4

In [501]:

```
#user input for interger value
#numerical value  will be store in user_name
user_number = int(input("Enter an integer: "))

# if and elif statement for divisble by 2 and 5
if  user_number%2==0 and user_number%5==0:
    print("\n1. User enter number is divisible by 2 and 5")
elif user_number%2!=0 and user_number%5!=0:
    print("\n1. User enter number is not divisble by 2 and 5")

#if and else statement for divisble by 2 or 5
if  user_number%2==0:
    print("\n2. User enter number is divisible by 2")
else:
    print("\n2. User enter number is not divisible by 2")
if user_number%5==0:
    print("\n2. User enter number is divisble by 5")
else:
    print("\n2. User enter number is not divisble by 5")

#if and elif statemenet for divisible or not divisble by 2 or 5
if user_number%2==0 or user_number%5==0:
    print("\n3. User enter number is divisible by 2 or 5 ")
elif user_number%2!=0 or user_number%5!=0:
    print("\n3. User enter number is not divisible by 2 or 5")

```

```
Enter an integer: 10

1. User enter number is divisible by 2 and 5

2. User enter number is divisible by 2

2. User enter number is divisble by 5

3. User enter number is divisible by 2 or 5
```