

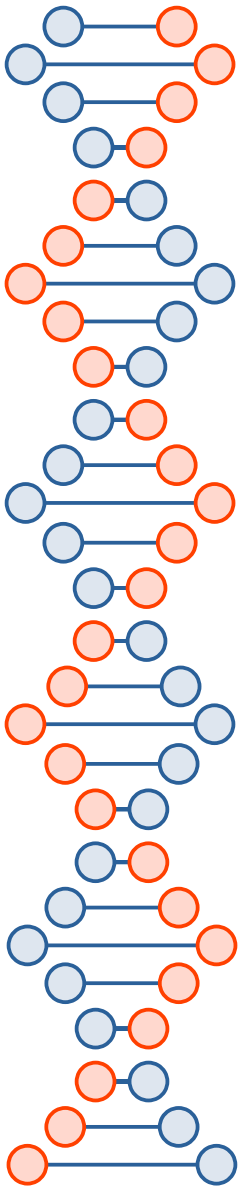
LibreOffice and OpenSource Conference 2024 Luxembourg

10 – 12 October 2024

Conditions in Python Programming and LibreOffice Calc

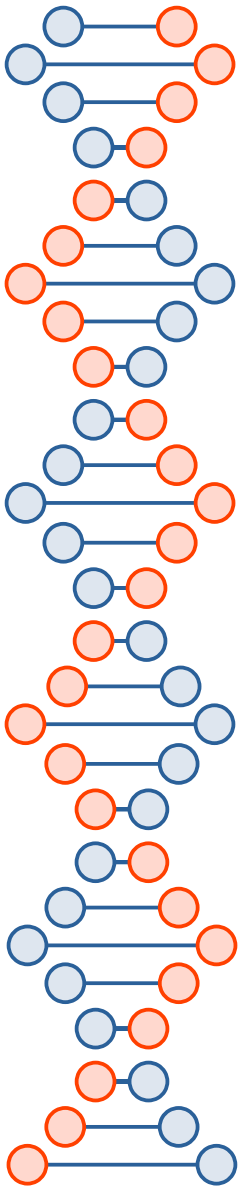
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I.Objectives

- Learn Conditions (if, sumif, sumifs, countif and countifs) and the implementation with some examples in LibreOffice Calc and Python Programming.
- Learn the differences between Conditions (if, sumif, sumifs, countif and countifs) in LibreOffice Calc and in Python Programming
- Learn how to read LibreOffice Calc using Python



II.Introduction

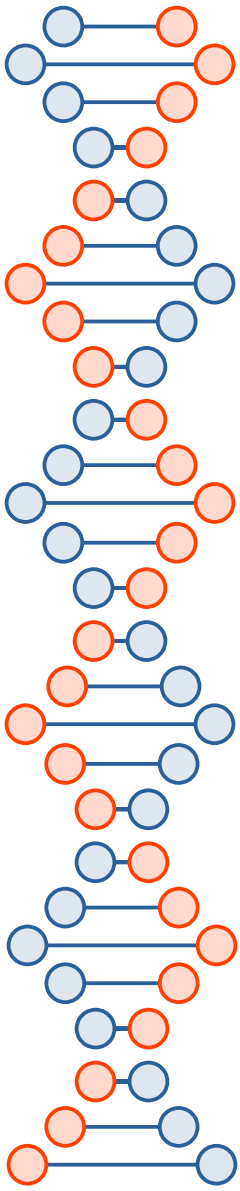
- Conditions or Conditionals are expressions which evaluate to either true or false. They are mostly used to determine Program Flow through if statements and while loops [1]
- Conditions besides applied in LibreOffice Calc also applied in other fields including in Computer Programming.
- One of Computer programming language is Python which implement Conditions.
- Some functions in Conditions in LibreOffice calc are : if () , countif () and sumif ()
- A Command in Conditions in Python programming are : if
- We use pandas in Python to read ods data.



III. Repository for files

Python Files and LibreOffice Calc File are available here :

https://github.com/sofwanbl/LibreOffice_talk_oct_2024



IV. If (1)

Function :

To test the argument which if it is True, the statement is executed otherwise the another statement is executed.

If in LibreOffice Calc

Syntax : if (Test, Then value, otherwise value) [2]

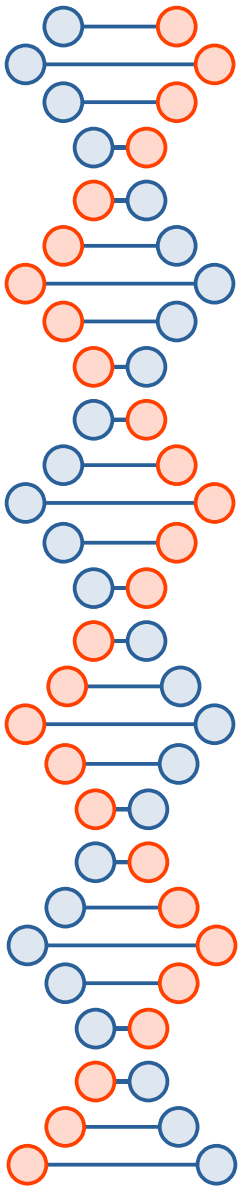
Example :

Problem 1 : Fill Description columns with "One" if the number is 1 and fill with "Not one " if the number is not 1.

	A	B	C	D
1				
2				
3				
4		No	Number	Description
5		1	9	Not One
6		2	5	Not One
7		3	7	Not One
8		4	-8	Not One
9		5	5	Not One
10		6	1	One

Figure 1 : Data for problem 1

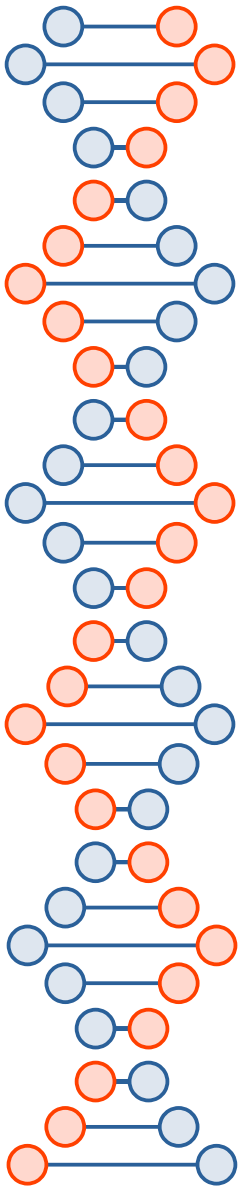
Answer : Cursor Location : D5 . =IF(C5=1,"One","Not One")



IV.If (2)

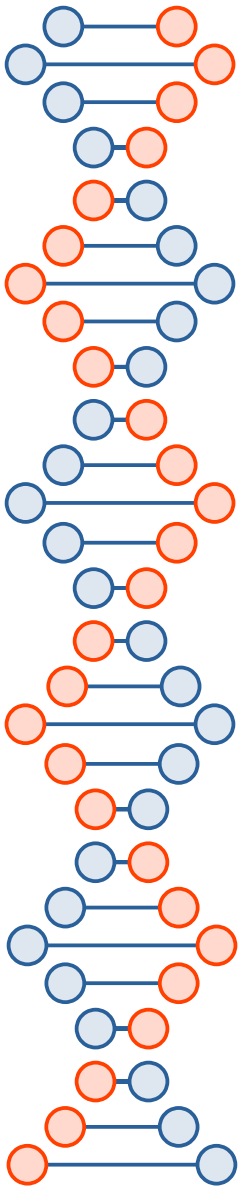
If in Python Programming

Syntax : “if” assignment_expression “:”
suite
“elif” assignment_operation “:”
suite
“else” “:”
suite
[2]



IV.If (3)

- Library is used :
Pandas : It is a fast, powerful, flexible and easy to use open source data analysis and manipulation tool for Python [3]
Methods : `read_excel()` --> to read ods data
`tolist()` --> to get column value which return as array



IV.If (4)

- Example :
Problem 1 : Type “One” if the number is 1 and type “Not one “ if the number is not 1

Solution 1 (Python) :

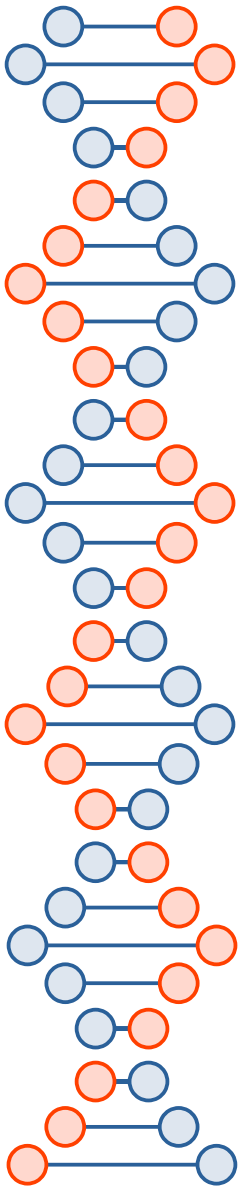
Algorithm :

- 1.import pandas
- 2.Load sheet from ods data
- 3.Get value from a column
- 4.Looping to get each data in the column
 - 4.a. Check if the number is 1 or not. Print “One” if the number is 1 otherwise print “Not One”.

IV.If (5)

Source Code for solution 1 (Python):

```
import pandas as pd
path = "c:/Users/SOFWAN/OneDrive - UNIVERSITAS
INDONESIA/Documents/Pembicara/Example - Conditions.ods"
dfnya=pd.read_excel(path, sheet_name="Sheet2")
x=dfnya["Number"].tolist()
for i in range(6):
    if x[i]==1:
        print(x[i], "One")
    else:
        print(x[i], "Not One")
```

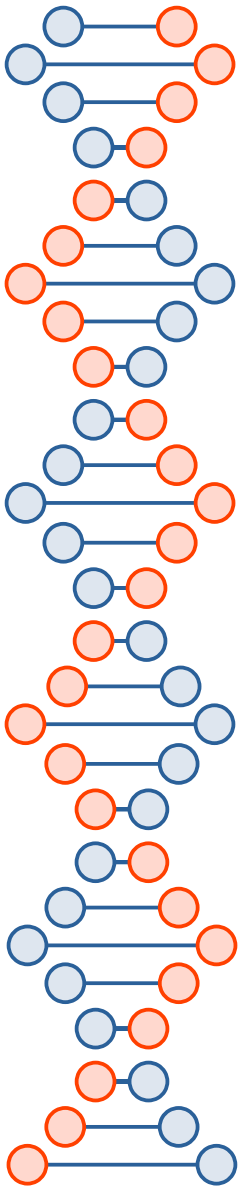


IV.If (6)

Result in Python for Solution 1:

```
9 Not One  
5 Not One  
7 Not One  
-8 Not One  
5 Not One  
1 One
```

Figure 2 : Result 1 in Python



IV.If (7)

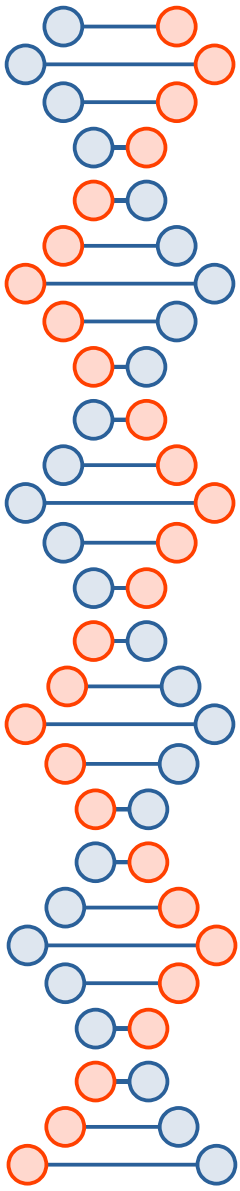
- Problem 2 :**
Fill Description column with “Positive” if the number is more than 0, fill with “Negative” if the number is less than 0 and “Zero” if the number is Zero.

	A	B	C	D
13				
14		No	Number	Description
15		1	9	Positive
16		2	5	Positive
17		3	7	Positive
18		4	-8	Negative
19		5	5	Positive
20		6	1	Positive

Figure 3 : Data for problem 2

Solution 2 (LibreOffice Calc)

Cursor location at D15 : `=IF(C15>0,"Positive",IF(C15<0,"Negative","Zero"))` 11



IV.If (8)

Solution 2 (Python).

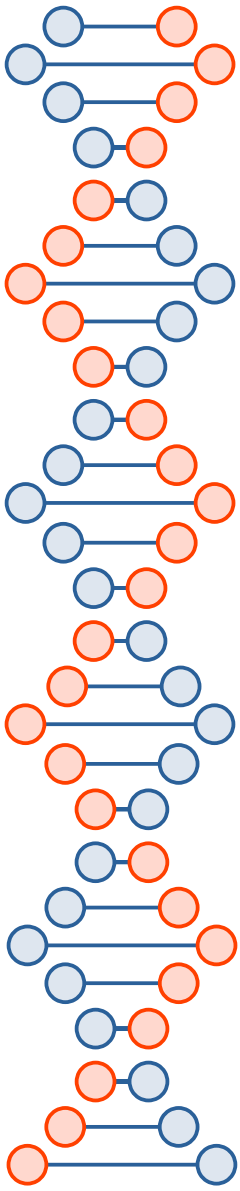
Algorithm :

- 1.import pandas
- 2.Load sheet from ods data
- 3.Get value from a column
- 4.Loop to get each data in the column
 - 4.a. Check if the number is more than 1 print "Positif" else if the number is less than 1, print "Negatif", else "Zero"

IV.If (9)

Source Code (Solution 2 Python)

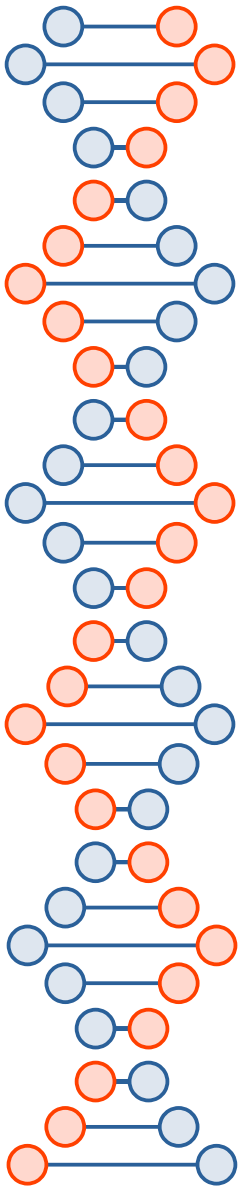
```
import pandas as pd
path = "c:/Users/SOFWAN/OneDrive - UNIVERSITAS
INDONESIA/Documents/Pembicara/Example - Conditions.ods"
dfnya=pd.read_excel(path, sheet_name="Sheet2")
x=dfnya["Number"].tolist()
for i in range(6):
    if x[i]>1:
        print(x[i], "Positif")
    elif x[i]<1:
        print(x[i], "Negative")
    else:
        print(x[i], "Zero")
```



IV.If (10)

↓	9 Positive
↓	5 Positive
↺	7 Positive
↻	-8 Negative
↓	5 Positive
🖨	1 Zero

Figure 4 : Result in Python for problem 2



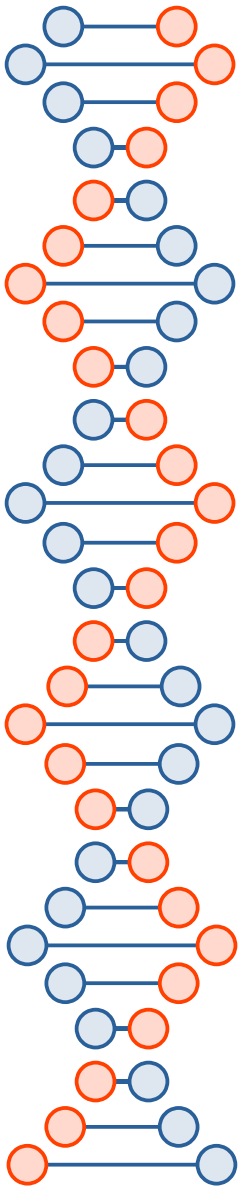
IV.If (10)

Problem 3 :

Fill with “Group A” if the number more than or equal with 0 and the number less than 10. Fill with “Group B” if the number more than or equal with 10 and the number less than 20. Fill with “Group C” if the number more than or equal with 20 and less than 30, otherwise “Group D”

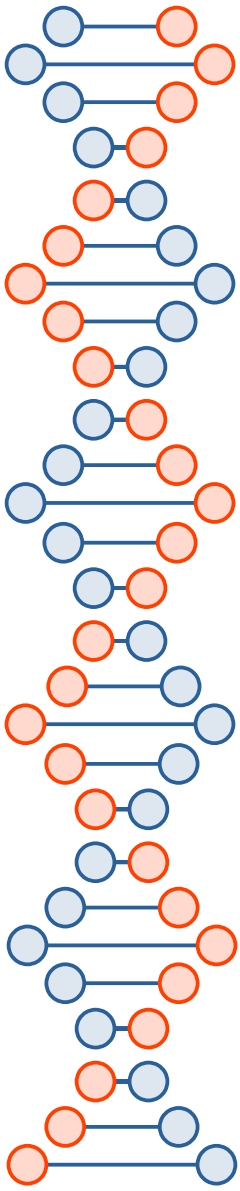
	A	B	C	D
22				
23				
24		No	Number	Description
25		1	9	Group A
26		2	5	Group A
27		3	7	Group A
28		4	-8	Group D
29		5	5	Group A
30		6	1	Group A

Figure 5 : Data for problem 3



IV.If (11)

- **Solution 3 (LibreOffice Calc) :**
Cursor at D24
`=IF(AND(C24>=0,C24<10),"Group A",IF(AND(C24>=10,C24<20),"Group B",IF(AND(C24>=20,C24<30),"Group C","Group D"))))`



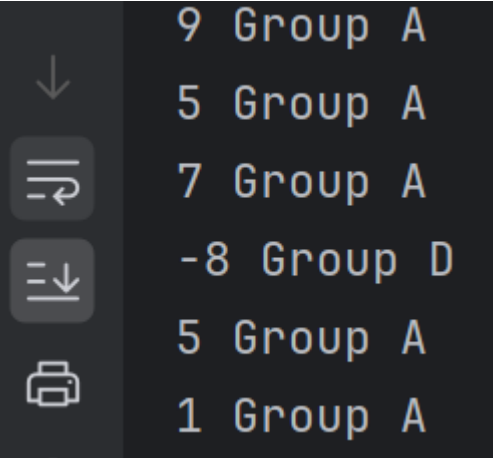
IV.If (12)

Source code - Solution 3 (Python) :

```
import pandas as pd
path = "c:/Users/SOFWAN/OneDrive - UNIVERSITAS
INDONESIA/Documents/Pembicara/Example - Conditions.ods"
dfnya=pd.read_excel(path, sheet_name="Sheet2")
x=dfnya["Number"].tolist()
for i in range(6):
    if x[i]>=1 and x[i]<10:
        print(x[i], "Group A")
    elif x[i]>=10 and x[i]<20:
        print(x[i], "Group B")
    elif x[i]>=20 and x[i]<30:
        print(x[i], "Group C")
    else:
        print(x[i], "Group D")
```

IV.If (13)

Result (Solution 3 (Python))



```
9 Group A
5 Group A
7 Group A
-8 Group D
5 Group A
1 Group A
```

Figure 6 : Result in Python for Problem 3

V. Sumif and Sumifs (1)

Function :

SumIf determines which cells in a range satisfy a specified criterion and calculates the sum of the numbers in those matched cells [4].

SumIfs same with SumIf but for more than 1 criterion.

Syntax :

=sumif(range, criteria, [sum_range]) [5]

=sumifs(sum_range, criteria_range1, criteria1, [criteria_range2, criteria2] ...) [6]

V. SumIf and SumIfs (2)

Problem 4 : Sum the number, if it is 5.

	G	H	I
3			
4		No	Number
5		1	9
6		2	5
7		3	7
8		4	-8
9		5	5
10		6	1
11			10

Figure 7 : Data for problem 4

Solution 4 (LibreOffice Calc) . Cursor at I11. =SUMIF(I5:I10,5)

V. SumIf and SumIfs (3)

- **Solution 4 (Python)**

Algorithm :

1. import pandas
2. Load sheet from ods data
3. Get value from a column
4. Print the numbers using Looping
5. Initialize sum variable, set to 0
6. Loop to get each data in the column
 - 6.a. Check if the number is 5, sum it.
7. Print the result.

V. SumIf and SumIfs (4)

Source code - Solution 4 (Python) :

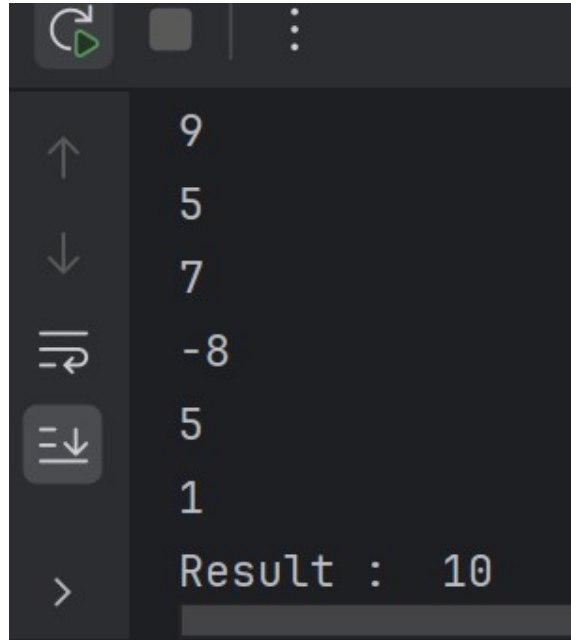
```
import pandas as pd
path = "c:/Users/SOFWAN/OneDrive - UNIVERSITAS
INDONESIA/Documents/Pembicara/Example - Conditions.ods"
dfnya=pd.read_excel(path, sheet_name="Sheet2")
x=dfnya["Number"].tolist()

for i in range(6):
    print(x[i])

sumx=0
for i in range(6):
    if x[i]==5:
        sumx=sumx+x[i]
print("Result : ",sumx)
```

V. SumIf and SumIfs (5)

- Result (Solution 4 (Python))



```
9
5
7
-8
5
1
Result : 10
```

Figure 8 : Result in Python for problem 4

V. SumIf and SumIfs (6)

Problem 5 : Sum the number if the number more than or equal with 0 and the number less than or equal with 10.

	G	H	I
13			
14		No	Number
15		1	9
16		2	5
17		3	7
18		4	-8
19		5	5
20		6	1
21			27

Figure 9 : Data for problem 5

Solution 5 (LibreOffice Calc).Cursor at I21.
`=SUMIFS(I15:I20, I15:I20,">0", I15:I20,"<=10")`

V. SumIf and SumIifs (7)

Solution 5 (Python)

Algorithm :

- 1.import pandas
- 2.Load sheet from ods data
- 3.Get value from a column
- 4.Print the numbers using Looping
- 5.Initialize sum variabel set to 0
- 6.Loop to get each data in the column
 - 6.a. Check if the number is more than or equal with zero and the number is less than or equal with 10, sum it.
7. Print the result.

V. SumIf and SumIfs (8)

Source code - Solution 5 (Python) :

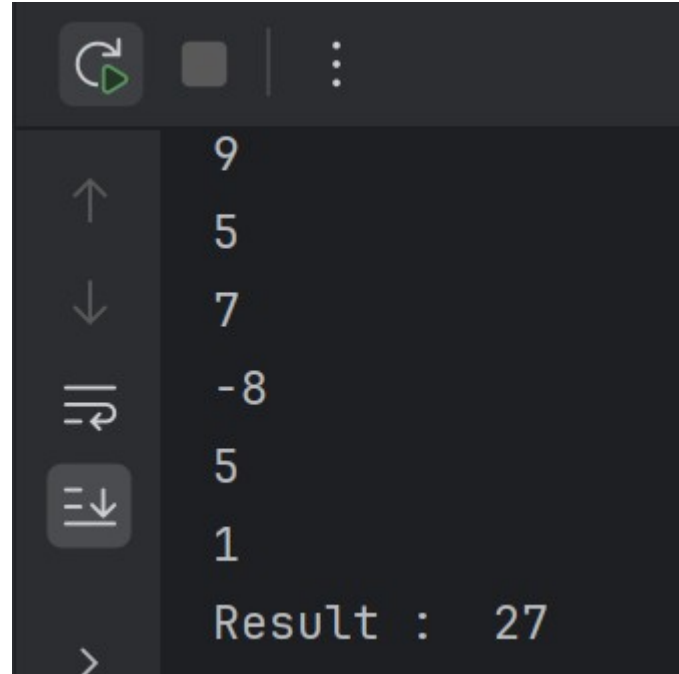
```
import pandas as pd

path = "c:/Users/SOFWAN/OneDrive - UNIVERSITAS  
INDONESIA/Documents/Pembicara/Example - Conditions.ods"
dfnya = pd.read_excel(path, sheet_name="Sheet2")
x = dfnya["Number"].tolist()
for i in range(6):
    print(x[i])

sumx = 0
for i in range(6):
    if x[i] >=0 and x[i]<=10:
        sumx = sumx + x[i]
print("Result : ", sumx)
```

V. SumIf and SumIfs (9)

Result (Solution 5 (Python))



A screenshot of a Python IDE window with a dark theme. The window contains a list of numbers: 9, 5, 7, -8, 5, 1. Below the list, it displays 'Result : 27'. The left sidebar shows navigation icons: a refresh button, a stop button, a menu button, and a list of files. The file list includes '9', '5', '7', '-8', '5', '1', and 'Result : 27'.

```
9
5
7
-8
5
1
Result : 27
```

Figure 10 : Result in Python for problem 5

V. SumIf and SumIfs (10)

Problem 6 :

Sum Number 3 if Number 1 is more than 5 and number 2 is more than 5

	G	H	I	J	K
22					
23		No	Number 1	Number 2	Number 3
24		1	1	1	8
25		2	2	2	9
26		3	6	5	5
27		4	6	7	5
28		5	8	8	10
29		6	10	12	11
30					26

Figure 11 : Data for problem 6

V. SumIf and SumIfs (11)

Solution 6 (LibreOffice Calc). Cursor at K30.
=SUMIFS(K24:K29,I24:I29,">5",J24:J29,">5")



V. SumIf and SumIfs (12)

- **Solution 6 (Python)**

Algorithm :

1. import pandas
2. Load sheet from ods data
3. Get value from each column
4. Print the numbers for each column using Looping
5. Initialize sum variable, set to 0
6. Loop to get each data in the column
 - 6.a. Check if the number 1 is more than 5 and number 2 is more than 5, if they are matched, sum number 3.
7. Print the result.

V. SumIf and SumIfs (13)

Source code - Solution 6 (Python) :

```
import pandas as pd

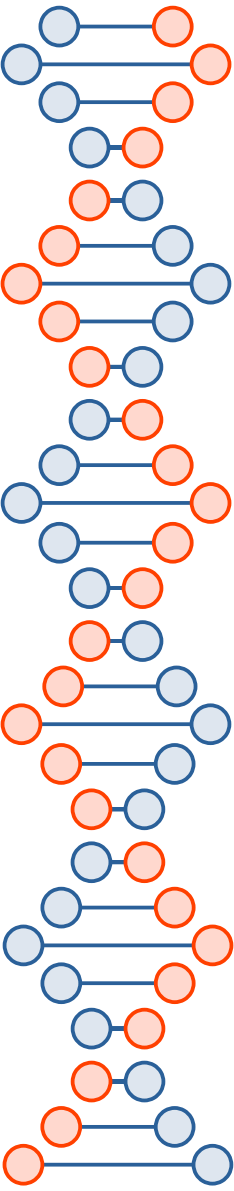
path = "c:/Users/SOFWAN/OneDrive - UNIVERSITAS INDONESIA/Documents/Pembicara/Example - Conditions.ods"
dfnya = pd.read_excel(path, sheet_name="Sheet3")
x = dfnya["Number 1"].tolist()
y = dfnya["Number 2"].tolist()
z = dfnya["Number 3"].tolist()
sumx = 0
print("Number 1 | Number 2 | Number 3")
for i in range(6):
    print(x[i], "|", y[i], "|", z[i])

sumx=0

for i in range(6):
    if x[i] >5 and y[i] > 5:
        sumx = sumx + z[i]
print("Result : ", sumx)
```

V. SumIf and SumIfs (14)

Result (Solution 6 (Python))



	Number 1	Number 2	Number 3
↑	1	1	8
↓	2	2	9
↔	6	5	5
⇓	6	7	5
	8	8	10
🖨	10	12	11
🗑	Result : 26		

Figure 12 : Result in Python for problem 6



VI. Countif and Countifs (1)

Function :

Countif : Calculate the number of cells in a range which satisfy a specified criterion [7].

- Countifs : Calculate the number of cells in a range which satisfy a specified criterion or criteria. [8]

Syntax :

=countif(range, criteria) [7]

=countifs(range 1, criteria 1 [, range 2; criteria 2 [, ...; [range 127 ; criteria 127]]) [8]

VI. Countif and Countifs (2)

Problem 7 : Count if the number is 5

	Q	R
3		
4	No	Number
5	1	9
6	2	5
7	3	7
8	4	-8
9	5	5
10	6	1
11		2

Figure 13 : Data for problem 7

Solution 7 (LibreOffice Calc). Cursor at R11 : =COUNTIF(R5:R10,5)

VI. Countif and Countifs (3)

Solution 7 (Python)

Algorithm :

- 1.import pandas
- 2.Load sheet from ods data
- 3.Get value from each column
- 4.Print the numbers for each column using Looping
- 5.Initialize count variabel set 0
- 6.Looping to get each data in the column
 - 6.a. Check if the number is 5 then count the number.
7. Print the result.

VI. Countif and Countifs (4)

Source code (Solution 7) - Python

```
import pandas as pd

path = "c:/Users/SOFWAN/OneDrive - UNIVERSITAS INDONESIA/Documents/Pembicara/Example - Conditions.ods"
dfnya = pd.read_excel(path, sheet_name="Sheet2")
x = dfnya["Number"].tolist()

# Print the numbers
for i in range(6):
    print(x[i])

countx=0
# Print result
for i in range(6):
    if x[i] == 5:
        countx = countx + 1
print("Result : ", countx)
```

VI. Countif and Countifs (5)

- Result (Solution 7 (Python))



```
9
5
7
-8
5
1
Result : 2
```

The screenshot shows a dark-themed Python console window. On the left, there is a vertical toolbar with icons for navigation (up/down arrows), undo/redo, a list with a downward arrow (highlighted), print, and delete. The main area of the console displays a list of numbers: 9, 5, 7, -8, 5, 1. Below these numbers, the text 'Result : 2' is displayed.

Figure 14 : Result in Python for problem 7

VI. Countif and Countifs (6)

Problem 8 : Count the number if the number more than or equal with 0 and the number less than or equal with 10

	P	Q	R
13			
14		No	Number
15		1	1
16		2	2
17		3	10
18		4	9
19		5	45
20		6	8
21			5

Figure 15 : Data for problem 8

Solution 8 (LibreOffice Calc) . Cursor at R21 .
=COUNTIF(R15:R20,">=0")-COUNTIF(R15:R20,">10")

VI. Countif and Countifs (7)

Solution 8 (Python)

Algorithm :

1. import pandas
2. Load sheet from ods data
3. Get value from each column
4. Print the numbers for each column using Looping
5. Initialize count variable set 0
6. Loop to get each data in the column
 - 6.a. Check if the number is more than or equal with 0 and the number less than or equal with 10 then count the number.
7. Print the result.

VI. Countif and Countifs (8)

Source code (solution 8) - Python

```
import pandas as pd


path = "c:/Users/SOFWAN/OneDrive - UNIVERSITAS  
INDONESIA/Documents/Pembicara/Example - Conditions.ods"  
dfnya = pd.read_excel(path, sheet_name="Sheet2")  
x = dfnya["Number"].tolist()

# Print the numbers  
for i in range(6):  
    print(x[i])

countx=0  
# Print result  
for i in range(6):  
    if x[i] >= 0 and x[i]<=10:  
        countx = countx + 1  
print("Result : ", countx)
```


VI. Countif and Countifs (9)

- Result (Solution 8 (Python))



```
9  
5  
7  
-8  
5  
1  
Result : 5
```

The screenshot shows a dark-themed terminal window. On the left side, there is a vertical toolbar with icons for navigation (up, down, search), undo, redo, and a trash can. The main area of the terminal displays a list of numbers: 9, 5, 7, -8, 5, and 1. Below this list, the text "Result : 5" is displayed, indicating the output of a Countif function applied to the list.

Figure 16 : Result in Python for problem 8

VI. Countif and Countifs (10)

- Problem 9** : Count the number if number 1 is more than 5 and number 2 is more than 5

	Q	R	S	T
22				
23	No	Number 1	Number 2	Number 3
24	1	1	1	8
25	2	2	2	9
26	3	6	5	5
27	4	6	7	5
28	5	8	8	10
29	6	10	12	11
30				3

Figure 17 : Data for problem 9

Solution 9 (LibreOffice Calc) . Cursor at T30.
=COUNTIFS(R24:R29,">5",S24:S29,">5")

VI. Countif and Countifs (11)

Solution 9 (Python)

Algorithm :

1. import pandas
2. Load sheet from ods data
3. Get value from each column
4. Print the numbers for each column using Looping
5. Initialize count variable set 0
6. Loop to get each data in the column
 - 6.a. Check if number 1 is more than 5 and number 2 is more than 5 then increment count variable.
7. Print the result.

VI. Countif and Countifs (12)

Source code (solution 9) - Python

```
import pandas as pd

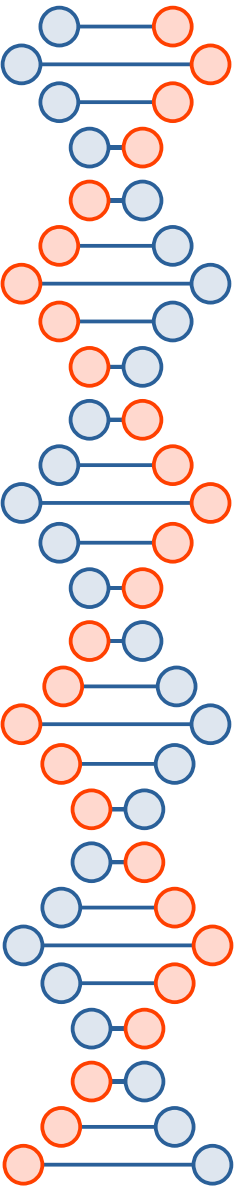
path = "c:/Users/SOFWAN/OneDrive - UNIVERSITAS INDONESIA/Documents/Pembicara/Example - Conditions.ods"
dfnya = pd.read_excel(path, sheet_name="Sheet3")
x = dfnya["Number 1"].tolist()
y = dfnya["Number 2"].tolist()
z = dfnya["Number 3"].tolist()

print("Num 1 | Num 2 | Num 3")
for i in range(6):
    print(x[i], " | ", y[i], " | ", z[i])

countx = 0
for i in range(6):
    if x[i] > 5 and y[i] > 5:
        countx = countx + 1
print("Result : ", countx)
```

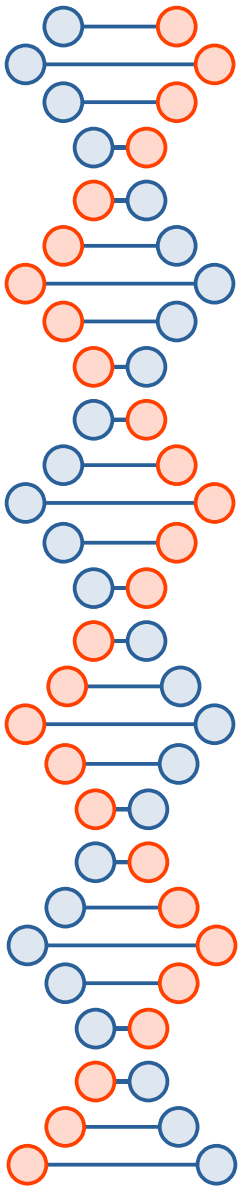
VI. Countif and Countifs (13)

- Result (Solution 9 (Python))



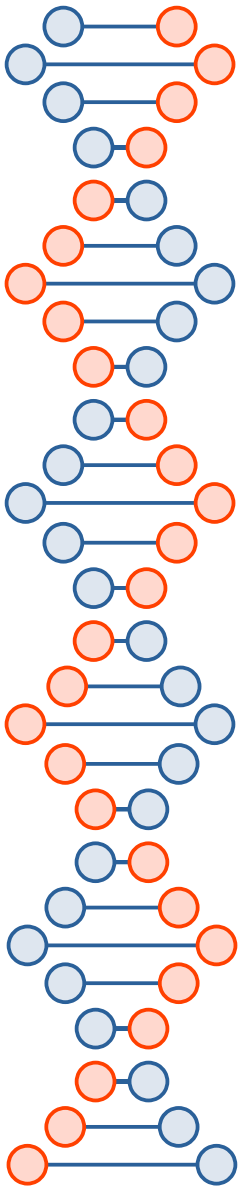
```
Num 1 | Num 2 | Num 3
1 | 1 | 8
2 | 2 | 9
6 | 5 | 5
6 | 7 | 5
8 | 8 | 10
10 | 12 | 11
Result : 3
```

Figure 18 : Result in Python for problem 9



VII. Conclusion

- If, Sumif, Sumifs, Countif and Countifs are some conditions in LibreOffice Calc to process data. In Programming, including Python Programming, there is also Conditions which it uses If. Those LibreOffice Calc Conditions are also applied in Python Programming by using only If.
- Python Programming is able to read LibreOffice Calc document



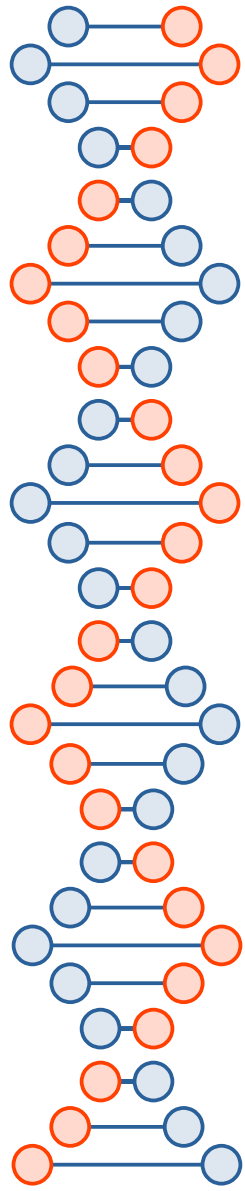
VIII.Reference (1)

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VIII.Reference (2)

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Thank You for your attention