

## Practice work 3 - Branch Structure in Python

**Objective:** get acquainted with the branching structure (if, if-else, if-elif-else).  
Learn to work with numbers and strings using this structure.

### Conditional branch operator if, if-else, if-elif-else

The if branch statement allows you to execute a certain set of instructions depending on some condition. The following options are possible use.

#### 1. if construct

The syntax of the if statement looks like this:

**if boolean expression:**

```
    team_1  
team_2  
    ...  
    team_n
```

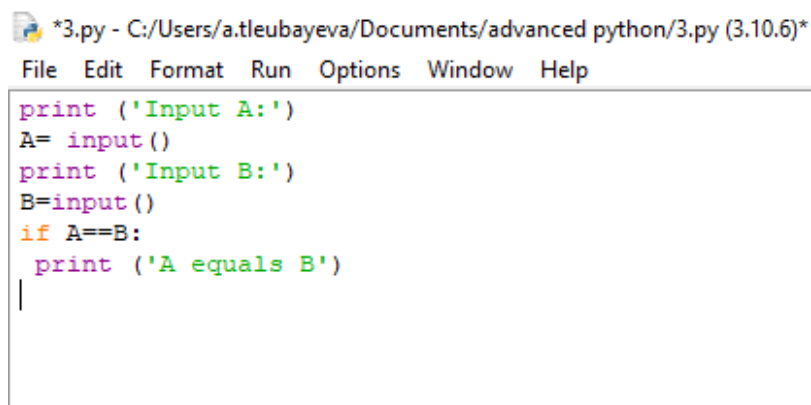
After the if statement, a logical expression is written.

**boolean expression-** design [language programming](#), which evaluates to true or false.

If this expression is true, then the instructions specified by the given operator are executed. An expression is true if its result is a non-zero number, a non-empty object, or the boolean True. The expression must be followed by a colon “:”.

**IMPORTANT:** the block of code to be executed, if the expression is true, is separated by four spaces from the left!

The program asks the user for two numbers, then compares them, and if the numbers are equal, that is, the logical expression `A==B` is true, then it displays corresponding message.



```
*3.py - C:/Users/a.tleubayeva/Documents/advanced python/3.py (3.10.6)*  
File Edit Format Run Options Window Help  
print ('Input A:')  
A= input()  
print ('Input B:')  
B=input()  
if A==B:  
    print ('A equals B')  
|
```

Python Program Example

## The result of executing a program using a conditional if statement

```
IDLE Shell 3.10.6
File Edit Shell Debug Options Window Help
Python 3.10.6 (tags/v3.10.6:9c7b4bd, Aug 1 2022, 21:53:49) [MSC v.1932 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Users/a.tleubayeva/Documents/advanced python/3.py =====
Input A:
10
Input B:
10
A equals B
>>> |
```

## 2. if-else construct

There are times when it is necessary to provide alternative program execution. Those, under true condition one set needs to be executed instructions, with false - another. For this, the if-else construct is used.

The syntax of the if-else statement looks like this:

if boolean expression:

team\_1

team\_2

...

team\_n

else:

team\_on

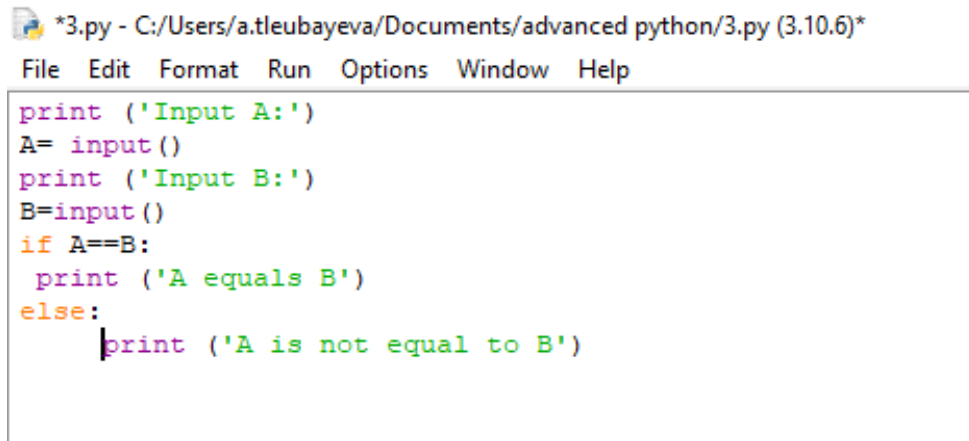
eteam\_2

...

team\_n

The program asks the user for two numbers, then compares them and if the numbers are equal, then there is a logical

expression `A==B` is true, then the appropriate message is displayed. Otherwise, a message is displayed that the numbers are not equal.

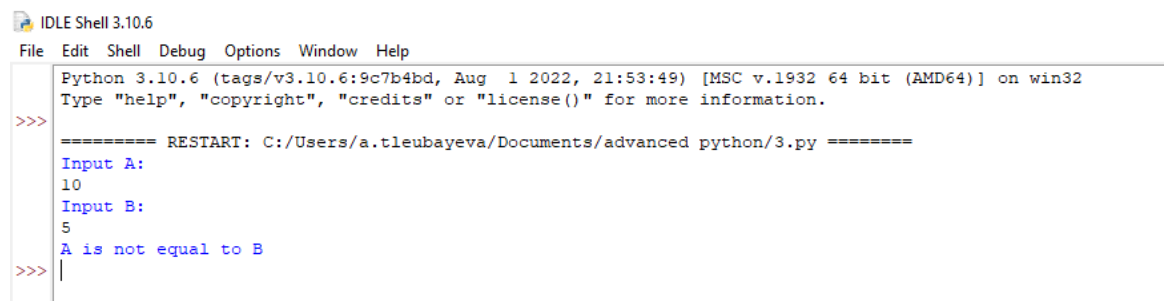


```
*3.py - C:/Users/a.tleubayeva/Documents/advanced python/3.py (3.10.6)*
File Edit Format Run Options Window Help

print ('Input A:')
A= input()
print ('Input B:')
B=input()
if A==B:
    print ('A equals B')
else:
    print ('A is not equal to B')
```

### Python Program Example

The result of executing a program using an if-else conditional statement



```
IDLE Shell 3.10.6
File Edit Shell Debug Options Window Help

Python 3.10.6 (tags/v3.10.6:9c7b4bd, Aug 1 2022, 21:53:49) [MSC v.1932 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

>>>
===== RESTART: C:/Users/a.tleubayeva/Documents/advanced python/3.py =====
Input A:
10
Input B:
5
A is not equal to B
>>> |
```

### 3. if-elif-else construct

To implement a choice from several alternatives, you can use the if - elif - else construct.

The syntax of the if statement is elif– else looks like that:

```
if boolean expression_1:
    team_o
neteam_2
...
```

```

team_n

elif boolean expression_2:
    team_o
neteam_2

...

team_n

elif boolean expression_3:
    team_o
neteam_2

...

team_n

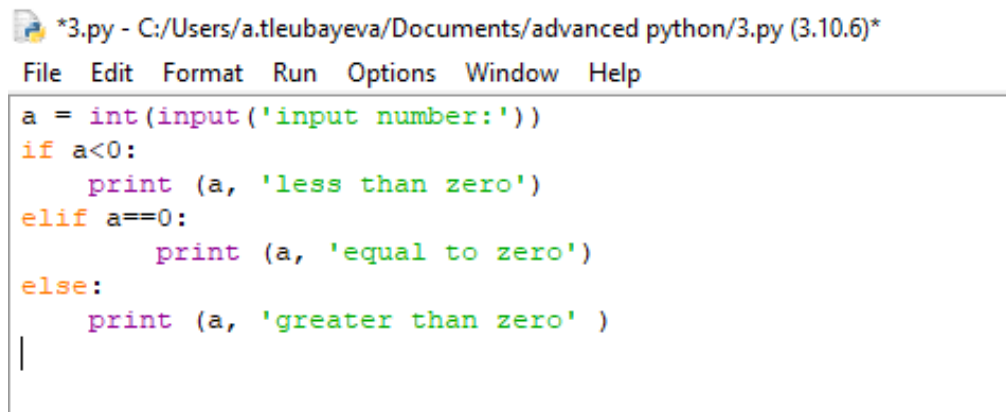
else:
    team_o
neteam_2

...

team_n

```

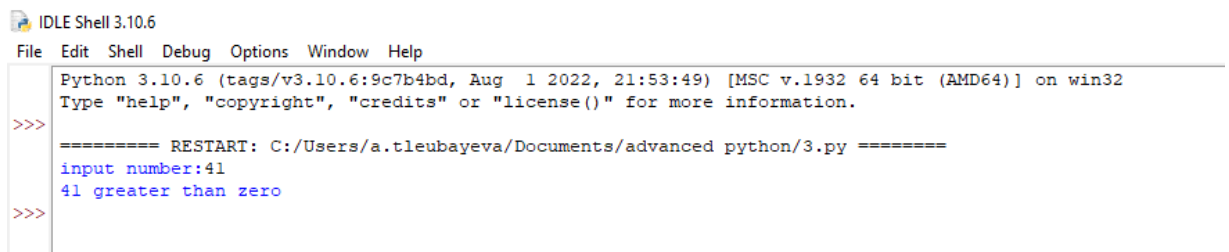
The program asks the user for a number and compares it with zero  $a < 0$ . If it is less than zero, then a message about it is displayed. If the first logical expression is not true, then the program goes to the second -  $a == 0$ . If it is true, then the program will display a message that the number is zero, otherwise, if both of the above logical expressions turned out to be false, then the program will display a message that the entered number is greater than zero.



```
*3.py - C:/Users/a.tleubayeva/Documents/advanced python/3.py (3.10.6)*
File Edit Format Run Options Window Help
a = int(input('input number:'))
if a < 0:
    print(a, 'less than zero')
elif a == 0:
    print(a, 'equal to zero')
else:
    print(a, 'greater than zero' )
|
```

## Python Program Example

The result of executing a program using the if-elif-else conditional statement



```
IDLE Shell 3.10.6
File Edit Shell Debug Options Window Help
Python 3.10.6 (tags/v3.10.6:9c7b4bd, Aug 1 2022, 21:53:49) [MSC v.1932 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Users/a.tleubayeva/Documents/advanced python/3.py =====
input number:41
41 greater than zero
>>>
```

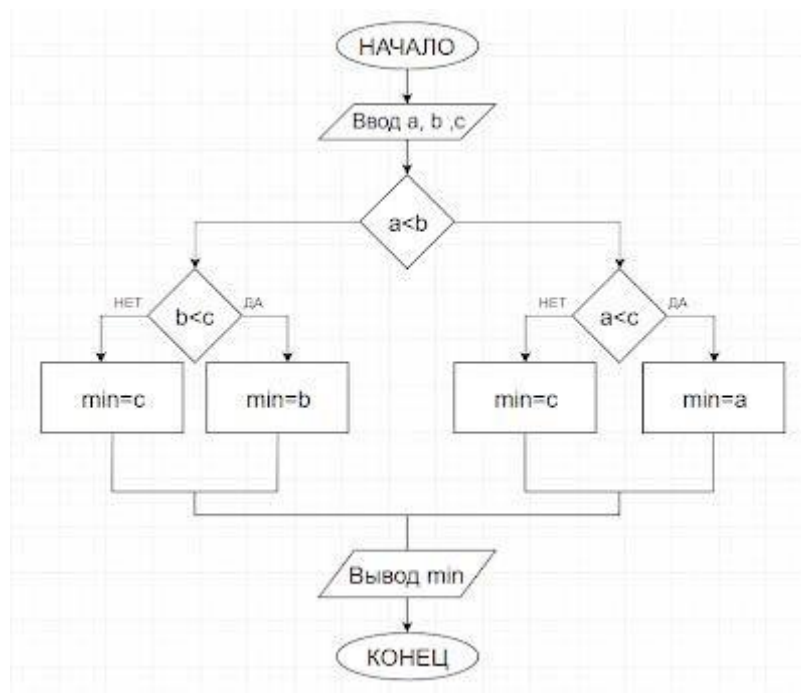
## Example

### Exercise

Given 3 numbers. Find the minimum among them and display it on the screen.

### Solution

For simplicity, we will construct a block diagram of the problem.



teams

```
a=input("")
```

```
b=input("")
```

```
c=input("")
```

let's enter three numbers by assigning values to the variables a, b, c.

Using the conditional if-else construct, we check the logical expression  $a < b$  for truth. If it is true, then go to the test of the logical expression  $a < c$ . If it is true, then the variable "y" will be assigned the value of the variable "a", i.e. "a" will be minimal, otherwise "y" will be assigned the value of the variable "c".

If at the beginning the logical expression  $a < b$  turned out to be false, then we proceed to check another logical expression  $b < c$ .

If it is true, then "y" will be assigned the value of the variable "b", otherwise "c". The `print()` command displays the minimum value.

```

#нахождение минимального из 3-х чисел
a=input('Введите целое число \n')
b=input('Введите целое число \n')
c=input('Введите целое число \n')
if a<b:
    if a<c:
        y=a
    else:
        y=c
else:
    if b<c:
        y=b
    else:
        y=c
print('Минимальное:', y)

```

Program example

```

Введите целое число
2
Введите целое число
5
Введите целое число
1
Минимальное: 1

```

The result of the program execution

### Tasks for independent work

#### Exercise

Three integers are given. Choose from them