**Comparison Operators** (also referred to as Relational Operators)

|  |  |  |
| --- | --- | --- |
| **Operation** | **What it means** | **Example** |
| == | Equality operator checks whether both values are the same. | >>> 7==6 False |
| !=  <> | Not equal to | >>> 8!=2 True |
| > | Greater than | >>> 65>12 True |
| < | Less than | >>> 21<12 False |
| >= | Greater than or equal to | >>> 15>=12 True |
| <= | Less than or equal to | >>> 34<=35 True |

**Logical Operators** (also referred to as Boolean Operators)

|  |  |  |
| --- | --- | --- |
| **AND** | Logical AND checks whether both conditions are true or false. | >>> x =6 >>> x > 0 and x < 7 True |
| **OR** | Logical OR checks whether EITHER of the conditions is true | >>> x =5 >>> y =8 >>> x /2==2 or y/4==2 True |
| **NOT** | Logical NOT reverses a Boolean value. In the example x > y evaluates to False; using the logical NOT reverses the evaluation to True. | >>> x =5 >>> y =8 >>> not (x>y) True |

### Challenge 1 – Comparison and Logical Operators.

Use print statements to find the answer to the following exercise. (Use IDLE interactive window).

1. Calculate the following (True or False):
   1. 23 != 15
   2. 5 + 3 < 10
   3. 6 > 10 == 10 < 2
2. If a = 3 and b = 8, what are the results of the following statements?
   1. a < b
   2. 6 >= a
   3. b > a == False
   4. True != (a == b)
3. If c = True and d = False, what are the results of the following statements?
4. c and d
5. not d or c
6. c == d and True

### Structure of the IF/ELIF/ELSE statement should follow these rules:

**If** Condition 1 = True**:**

Execute Code 1

**elif** Condition 2 = True**:**

Execute Code 2

**else:**

Execute Code 3

### Challenge 2 – Minimum

Write a Python code.

* Ask the user to input two number
* Assign the smaller of the two number the variable name **Minimum.**

### Example

X = 5

Y = 8

If x == y:

Print(“x and y are equal”)

Else:

If x < y:

print(“x is less than y”)

else:

print(“x is greater than y”)

This should print out;

>>>

x is less than y

>>>

i = 20;

if (i < 15):

    print ("i is smaller than 15")

    print ("I’m in if Block")

else:

    print ("i is greater than 15")

    print ("I’m in else Block")

print ("I’m not in if and not in else Block")

Note: Indentation is one of the main keys with Loops. Also make sure you use colon.

### Challenge 3 – The elif clause.

Write a statement to assign the grade to a variable called **grade** depending on the value of **mark.**

Students are assigned a grade of A, B, C or F depending on the average mark they have achieved over a number of assignments.

Mark of 75 or more: A

Mark of 60 – 74: B

Mark of 50 – 59: C

Mark less than 50: F

Note: You will need an input statement to ask the student their average mark. Also use

### You can test any number of conditions using these methods of If/elif/else. The code does not have to include an ELSE but, if it does, it must be the last statement.

### Nesting IF Statements

We can also use IF/ELIF to check sub-conditions in a program. If there is more than one condition to be tested, you can use a nested selection statement.

if (condition1):

# Executes when condition1 is true

if (condition2):

# Executes when condition2 is true

# if Block is end here

# if Block is end here

num = float(input("Enter a number: "))

if num >= 0:

if num == 0:

print("Zero")

else:

print("Positive number")

else:

print("Negative number")

Remember INDENTATION

# In this program, we input a number

# check if the number is positive or

# negative or zero and display

# an appropriate message

# This time we use nested if

num = int(input('Enter a number between -999 to 900: '))

if num > 0:

print("Positive Number")

else:

print("Negative Number")

if num <-9: Nested If

print("Two digit Negative Number")

Additional indentation

### Challenge 4 – Nesting

Create a code using if statements that use the nested IF feature.

Eg Hair dresser, charges £5 for dry cut, wash and cut £10, shave £7.

Nest—if the age of person is over 60 then get 10% discount.

### Challenge 5 – Nesting

Create a code using if statements that use the nested IF feature.

Create your own code using nested if.