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Lesson 5a: Comparison Operators

These are the comparison operators:

- == decides if 2 things are equal (5 == 5) is True
- != decides if 2 things are not equal (5 != 6) is True
- > decides if first is greater than the second (5 > 4) is True
- >= decides if first is greater than or equal to the second (5 >= 5) is True
- < decides if first is smaller than the second (4 < 5) is True
- <= decides if first is smaller than or equal to the second (4 <= 4) is True
- is decides if the first is the same as second (7-2 is 5) is True
- is not decides if the first is not the same as the second (5.0 is not 5) is True

Lesson 5b: If/elif/else

There are 1 or more parts to a the **if** statement.

if (a < b): # this part is required

 print(a,"is smaller than",b) #something needs to be done – also notice the indentation.

elif (a<c): # this part is optional

 print(a,"is smaller than c but not smaller than",b)

elif (a<d): # this can be repeated as many times as necessary

 print(a,"is smaller than d but smaller than",b,"or",c)

else: # this part is optional

 print(a,"is not smaller than any of them")

Lesson 5c: Indentation

Python 3 uses indentation to determine blocks of code.

4 spaces (or tab set to 4 spaces) – this lets computer know what is part of if statement.

Example:

```
if (a<b):
```

```
    print("Yes")
```

```
    print("No")
```

Will print both Yes and No if a < b

```
if (a<b):
```

```
    print("Yes")
```

```
print("No")
```

Will print Yes if a<b but will print No everytime.

Homework for Lesson 5

Do the following using Python 3

- 1) Using if/elif/else – find out the order of a, b and c (make no assumptions about the numbers). If any are the same – make sure you tell them. Example: a is first, b and c is second. Feel free to use any method you want to show order. Example: you could also say a is number 1 and b and c are tied for number 2. You have “creative freedom”. This is important to learn. Feel free to show your output to the Youtube comments but don’t show your code.
- 2) Take in 2 numbers and use all the comparison operators on them and print out the comparison example:

```
if (a<=b):
```

```
    print(a,"is less than or equal to",b) or you can do
```

```
    print(a,"is less than or equal to",b,"as shown in",a,"<=",b)
```

- 3) Ask for a float and determine mathematically if they really entered a number equivalent to an integer. Example: if they entered 26.0 – that is equivalent to 26 and that is an integer. So, say “Yes, they entered an integer.” Hint: Go back and look at the ways to do division and how do you know if it is an integer?
- 4) Ask for an integer and determine if they entered an odd or even.
- 5) Ask for 2 integers and determine if one is a multiple of the other.
- 6) Same as #5 but do it with floats.
- 7) ask for 3 sides of a triangle – see if they are scalene, isosceles, equilateral or doesn’t exist.
- 8) ask for length and width of a rectangle. Give the perimeter and the area of the rectangle.
- 9) ask for a number – tell if it is positive, negative or zero
- 10) ask for a year and determine if it is a leap year (look up rules if you need to)
- 11) Using your own rules for age of baby, toddler, child, teenager, adult or senior citizen – determine which of the following they are when they enter their age.
- 12) ask for 2 numbers and do all the simple calculator methods on it (say division by 0 error if b = 0).
- 13) Before coding I want you to determine the fewest numbers (1-10) that you need to determine if a number is divisible by all the numbers 1-10. Now for the coding part – use ONLY those numbers to tell if a number they enter is a multiple of all the numbers from 1-10.

BONUS!!! Using if/elif/else – find out the order of a, b, c and d (assume all different numbers) # remember you would NEVER do this in a real program – you will learn better ways later.