Week2_hw2_mohammad reza velayati

Chapter 4 exercises

1. What possible values can a Boolean expression have?

True and false

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2. Where does the term Boolean originate?

The term Boolean comes from the name of the British mathematician George Boole.

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3. What is an integer equivalent to True in Python?

All of the negative and positive integers are True. Except 0, the 0 is False.

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4. What is the integer equivalent to False in Python?

0 is False in Python

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5. Is the value -16 interpreted as True or False?

True

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6. Given the following definitions:

x, y, z = 3, 5, 7

Evaluate the following Boolean expressions:

(a) x == 3	True
(b) x < y	True
(c) x >= y	False
(d) x <= y	True
(e) x != y - 2	False
(f) x < 10	True
(g) x >= 0 and x < 10	True
(h) x < 0 and x < 10	False
(i) x >= 0 and x < 2	False

(j) x < 0 or x < 10 True

(k) x > 0 or x < 10 True

(l) x < 0 or x > 10 False

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7. Given the following definitions:

x, y = 3, 5

b1, b2, b3, b4 = True, False, x == 3, y < 3 → # b1=T, b2=F, b3=T, b4=F

Evaluate the following Boolean expressions:

(a) b3 True

(b) b4 False

(c) not b1 False

(d) not b2 True

(e) not b3 False

(f) not b4 True

(g) b1 and b2 False

(h) b1 or b2 True

(i) b1 and b3 True

(j) b1 or b3 True

(k) b1 and b4 False

(l) b1 or b4 True

(m) b2 and b3 False

(n) b2 or b3 True

(o) b1 and b2 or b3 True

(p) b1 or b2 and b3 True

(q) b1 and b2 and b3 False

(r) b1 or b2 or b3 True

(s) not b1 and b2 and b3 False

(t) not b1 or b2 or b3 True

(u) not (b1 and b2 and b3) True

(v) not (b1 or b2 or b3) False

(w) not b1 and not b2 and not b3	False
(x) not b1 or not b2 or not b3	True
(y) not (not b1 and not b2 and not b3)	True
(z) not (not b1 or not b2 or not b3)	True

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8. Express the following Boolean expressions in simpler form; that is, use fewer operators or fewer symbols. x is an integer.

(a) not (x == 2)	x != 2
(b) x < 2 or x == 2	x <= 2
(c) not (x < y)	x >= y
(d) not (x <= y)	x > y
(e) x < 10 and x > 20	------
(f) x > 10 or x < 20	10 < x < 20
(g) x != 0	not (x == 0)
(h) x == 0	not (x != 0)

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9. Express the following Boolean expressions in an equivalent form without the not operator. x and y are integers.

(a) not (x == y)	x != y
(b) not (x > y)	x >= y
(c) not (x < y)	x >= y
(d) not (x >= y)	x < y
(e) not (x <= y)	x > y
(f) not (x != y)	x == y
(g) not (x != y)	x == y
(h) not (x == y and x < 2)	x != y or x >= 2
(i) not (x == y or x < 2)	x != y and x >= 2
(j) not (not (x == y))	x == y

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10. What is the simplest tautology?

A tautology simply means, it's always true. So "True" would be the simplest tautology.

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11. What is the simplest contradiction?

"False" would be the simplest contradiction.

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12. Write a Python program that requests an integer value from the user. If the value is between 1 and 100 inclusive, print ”OK;” otherwise, do not print anything.

```
num = int(input("input a number between 1 to 100"));
    if 1 < num < 100:
        print ("OK");
```

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13. Write a Python program that requests an integer value from the user. If the value is between 1 and 100 inclusive, print ”OK;” otherwise, print ”Out of range.”

```
num = int(input("input a number between 1 to 100"));
    if 1 < num < 100:
        print ("OK");
    else:
        print ("Out of range")
```

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14. Write a Python program that allows a user to type in an English day of the week (Sunday, Monday, etc.). The program should print the Spanish equivalent, if possible.

```
print("\t\t\t<< Do you want to learn days in Spanish? >> ")

                while (True):

                    day = input("\nEnter a day  ")

                    if day  == "saturday" or 'sat' or 'satur' :
                        print("\n\t\t\t<< In Spanish it is ' Sábado ' >>\n")


                    elif day == 'sunday' or 'sun' or 'sund' :
                        print("\n\t\t\t<< In Spanish it is ' Domingo ' \n")


                    elif day == 'monday' or 'mon' or 'mond':
                        print("\n\t\t\t<< In Spanish it is ' Lunes ' \n")


                    elif day == "tuesday" or 'tues' or 'tu':
                        print("\n\t\t\t<< In Spanish it is ' Martes ' \n")


                    elif day == 'wednesday' or 'wedn' or 'wednes' :
```

```
            print("\n\t\t\t<< In Spanish it is ' Miércoles ' \n")


        elif day == "thursday" or 'thurs' or 'thur' :
            print("\n\t\t\t<< In Spanish it is ' Jueves ' \n")


        elif day == 'friday' or 'fri' or 'f' :
            print("\n\t\t\t<< In Spanish it is ' Viernes ' \n")


        else :
            print("\n\t\t\t Incorrect !!! Try again... \n")
        # Thursday
        elif day == "thursday" or 'thurs' or 'thur' :
            print("\n\t\t\t<< In Spanish it is ' Jueves ' \n")

        # Friday
        elif day == 'friday' or 'fri' or 'f' :
            print("\n\t\t\t<< In Spanish it is ' Viernes ' \n")

        # End cheking
        elif day == 'end' or 'e' or 'en' :
            print("Have a nice time :) ")
            break

        else :
            print("\n\t\t\t Incorrect input i don't underestand :) \n")
```

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15. Consider the following Python code fragment:

```
# i, j, and k are numbers
if i < j:
if j < k:
i = j
else:
j = k
else:
if j > k:
j = i
else:
i = k
print("i =", i, " j =", j, " k =", k)
```

What will the code print if the variables i, j, and k have the following values?

(a) i is 3, j is 5, and k is 7	i = 5 , j = 5 , k = 7
(b) i is 3, j is 7, and k is 5	i = 3 , j = 5 , k = 5
(c) i is 5, j is 3, and k is 7	i = 7 , j = 3 , k = 7
(d) i is 5, j is 7, and k is 3	i = 5 , j = 3 , k = 3
(e) i is 7, j is 3, and k is 5	i = 5 , j = 3 , k = 5
(f) i is 7, j is 5, and k is 3	i = 7 , j = 7 , k = 3

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16. Consider the following Python program that prints one line of text:

```
val = int(input())
if val < 10:
if val != 5:
print("wow ", end='')
else:
val += 1
else:
if val == 17:
val += 10
else:
print("whoa ", end='')
print(val)
```

What will the program print if the user provides the following input?

(a) 3	wow
(b) 21	whoa
(c) 5	6
(d) 17	27
(e) -5	wow

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17. Consider the following two Python programs that appear very similar:

n = int(input())
if n < 1000:
print('*', end='')
if n < 100:
print('*', end='')
if n < 10:
print('*', end='')
if n < 1:
print('*', end='')
print()
	n = int(input())
	if n < 1000:
	print('*', end='')
	elif n < 100:
	print('*', end='')
	elif n < 10:
	print('*', end='')
	elif n < 1:
	print('*', end='')
	print()

How do the two programs react when the user provides the following inputs?

(a) 0	(1) ---> ****	&&	(2) ---> *
(b) 1	(1) ---> ***	&&	(2) ---> *
(c) 5	(1) ---> ***	&&	(2) ---> *
(d) 50	(1) ---> **	&&	(2) ---> *
(e) 500	(1) ---> *	&&	(2) ---> *
(f) 5000	(1) --->	&&	(2) --->

Why do the two programs behave as they do?

because A checks for each if statement, and if more than one of them is true it will print astrix more than one time. but B has a n<1000 as the first if and the other statements as elif so even tho numbers are small, but as long as they are smaller that 1000 the first if activates and other elifs wont act.

18. Write a Python program that requests five integer values from the user. It then prints the maximum and minimum values entered. If the user enters the values 3, 2, 5, 0, and 1, the program would indicate that 5 is the maximum and 0 is the minimum. Your program should handle ties properly; for example, if the user enters 2, 4, 2, 3, and 3, the program should report 2 as the minimum and 4 as maximum.

```
n1 = int(input("num 1 --> "))
        max = n1
        min = n1
        n2 = int(input("num 2 --> "))
        n3 = int(input("num 3 --> "))
        n4 = int(input("num 4 --> "))
        n5 = int(input("num 5 --> "))

        # Check minimum num
        if n2 < min :
          min = n2
        if n3 < min :
          min = n3
        if n4 < min :
          min = n4
        if n5 < min :
          min = n5
        print("Min = ",min)
        # Maximum check
        if n2 > max :
          max = n2
        if n3 > max :
          max = n3
        if n4 > max :
          max = n4
        if n5 > max :
          max = n5
        print("Max = ",max)
```

19. Write a Python program that requests five integer values from the user. It then prints one of two things:
if any of the values entered are duplicates, it prints "DUPLICATES"; otherwise, it prints "ALL UNIQUE".

```
repeat = 0;
temp = None;
for i in range(5):
    number = int(input("Please Enter a integer: "));
    if number == temp:
        repeat = 1;
    else:
        temp = number;
    if repeat:
        print("DUPLICATES");
    else:
        print("ALL UNIQUE");
```