

evaluate the following Boolean expressions:

True.

(b)
$$x < y$$

True.

(c)
$$x \ge y$$

False.

True.

False.

(f)
$$x < 10$$

True.

(g)
$$x \ge 0$$
 and $x < 10$

True and True = True.

(h)
$$x < 0$$
 and $x < 10$

False and True = False.

(i)
$$x \ge 0$$
 and $x < 2$

True and False = False.

(j)
$$x < 0$$
 or $x < 10$

False or True = True.

(k)
$$x > 0$$
 or $x < 10$

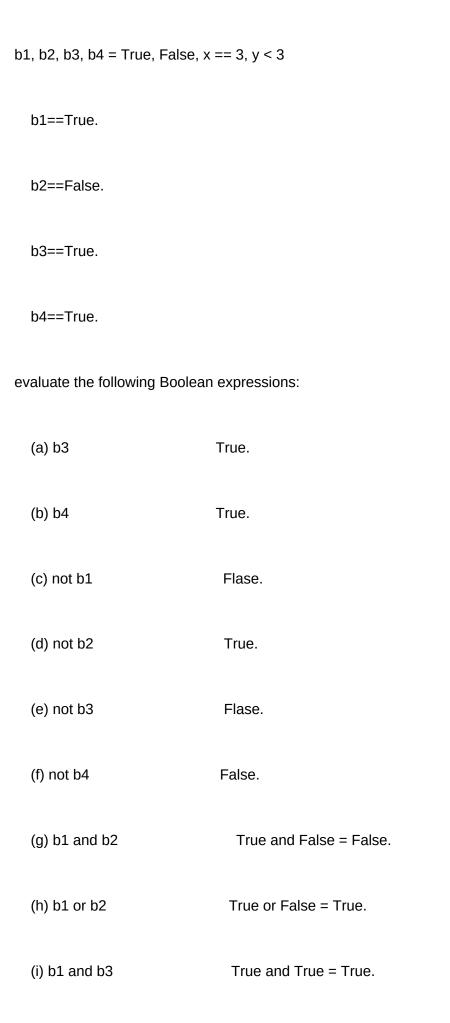
True or True = True.

(I)
$$x < 0$$
 or $x > 10$

False or False = False.

7. Given the following definitions:

$$x, y = 3, 5$$



(j) b1 or b3 True or T	rue = True.
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(o) b1 and b2 or b3
$$x$$
 True and False or True = True.

(r) b1 or b2 or b3 True or False or True = True.

(s) not b1 and b2 and b3 False and False and True = False.

(t) not b1 or b2 or b3 False or True or True = True.

(u) not (b1 and b2 and b3) not(True and False and True) = True.

(v) not (b1 or b2 or b3) not(True or False or True) = False.

(w) not b1 and not b2 and not b3 False and True and False = False.

(x) not b1 or not b2 or not b3 False or True or False = True.

- (y) not (not b1 and not b2 and not b3) not(False and True and False) = True.
- (z) not (not b1 or not b2 or not b3) not(False or True or False) = False.

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
$$(x \le y)$$
 $x > y$

(e)
$$x < 10$$
 and $x > 20$ $x > 20$.

(f)
$$x > 10$$
 or $x < 20$ $10 < x < 20$.

(g)
$$x != 0$$
 not $(x== 0)$.

(h)
$$x == 0$$
 not $(x!- 0)$.

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

(b) not
$$(x > y)$$
 $x \le y$

(c) not
$$(x < y)$$
 $x >= y$

(d) not
$$(x \ge y)$$
 $x < y$

(e) not
$$(x \le y)$$
 $x > y$

(f) not
$$(x != y)$$
 $x == y$

(g) not
$$(x != y)$$
 $x == y$

(h) not
$$(x == y \text{ and } x < 2)$$
 $x != y \text{ or } x >= 2$

(i) not
$$(x == y \text{ or } x < 2)$$
 $x != y \text{ and } x >= 2$

(j) not (not
$$(x == y))$$
 $x == y$

10. What is the simplest tautology?

True.

11. What is the simplest contradiction?

```
a = not a.
```

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.

```
number = None;

while not number:
--number = input("Please enter a number: ");

number = int(number);

if number <= 100 and number >= 1:
--print("Okay");
```

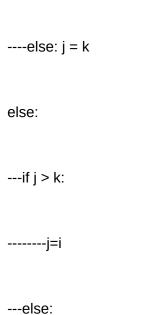
13. Write a Python program that requests an integer value from the user. If the value is between 1 and 100 inclusive, print "OK;" otherwise, print "Out of range."

```
number = None;
```

while not number:

```
--number = input("Please enter a number: ");
  number = int(number);
  if number <= 100 and number >= 1:
  --print("Okay");
  else:
  --print("Out of Range!");
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.
  Please note that im infering the question asks for elifs, because we
  can use match, case: as well.
  day = None;
  while not day:
  -- day = input("Please Enter a week day: ");
  if day == "monday":
  -- print("Monday is lunes in spanish!");
  elif day == "tuesday":
  -- print("Tuesday is martes in spanish!");
```

```
elif day == "wednesday":
  -- print("Wednesday is miércoles in spanish!");
  elif day == "thursday":
  -- print("Thursday is jueves in spanish!");
  elif day == "friday":
  -- print("Friday is viernes in spanish!");
  elif day == "saturday":
  -- print("Saturday is sábado in spanish!");
  elif day == "sunday":
  -- print("Sunday is domingo in spanish!");
  else:
  -- print("You did not enter a week day!");
15. Consider the following Python code fragment:
#i, j, and k are numbers
if i < j:
---if j < k:
----i=j
```



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

(a) i is 3, j is 5, and k is 7 prints:
$$i=5$$
 $j=5$ $k=7$

(b) i is 3, j is 7, and k is 5 prints:
$$i=3$$
 j=5 k=5

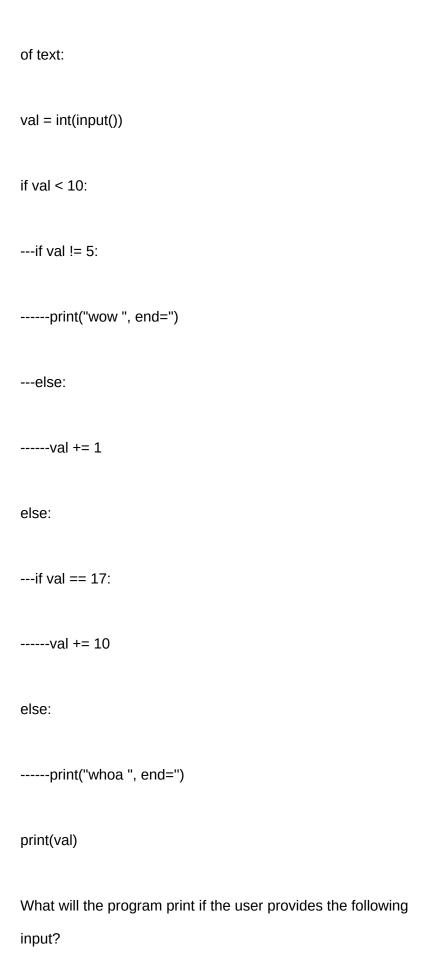
(c) i is 5, j is 3, and k is 7 prints:
$$i=7$$
 j=3 k=7

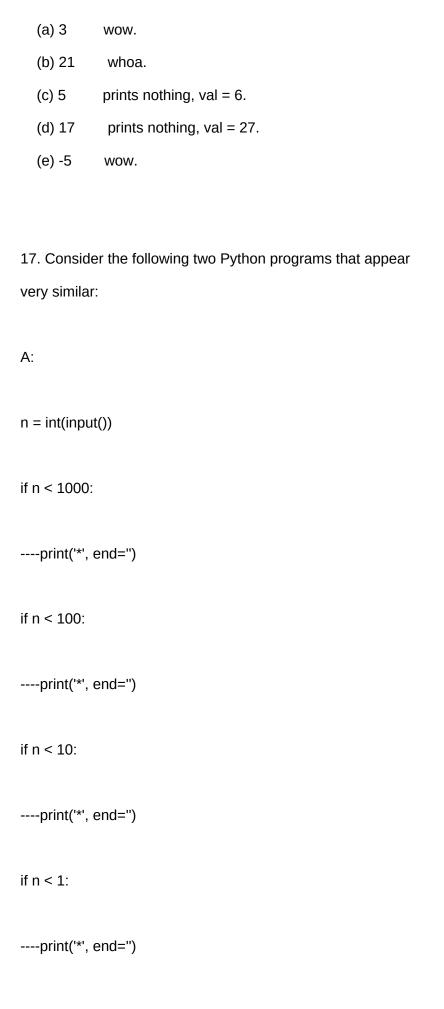
(d) i is 5, j is 7, and k is 3 prints:
$$i=5$$
 $j=3$ $k=3$

(e) i is 7, j is 3, and k is 5 prints:
$$i=5$$
 $j=3$ $k=5$

(f) i is 7, j is 5, and k is 3 prints:
$$i=7$$
 $j=7$ $k=3$

16. Consider the following Python program that prints one line





```
print()
B:
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 A:****, B:*
  (b) 1 A:***, B:*
  (c) 5 A:***, B:*
```

```
(d) 50
                   B:*
           A:**,
  (e) 500 A:*,
  (f) 5000 A:nothing, B:nothing.
  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
  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 that5 is the maximum and 0 is the
minimum. Your program should handle ties properly; forexample, if the user enters 2, 4, 2, 3,
and 3, the program should
report 2 as the minimum and 4 as maximum.
  Please note that im infering we have no knowledge of min() and
  max() existing...
  max = None;
  min = None;
  for i in range(5):
```

```
-- number = int(input('Please enter a number: '));
  -- if i == 0:
        max = number;
        min = number;
  elif(number < min):
        min = number;
  elif(number > max):
        max = number;
  print("Max is:", max, "\nMin is:", min);
19. Write a Python program that requests five integer values from theuser. 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");
"""
```