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Question 1 (Data Types)

What is the expected output of the following code if the user enters 11 and 4 ?

```
x = int(input())
y = int(input())
x = x % y
x = x % y
y = y % x
print(y)
```

A. `1`

B. `2`

C. `3`

D. `4`

Solution 1

In [2]:
```
# 11 and 4
x = int(input())  # x = 11
y = int(input())  # y = 4
x = x % y         # x = 11 % 4 => x = 3
x = x % y         # x =  3 % 4 => x = 3
y = y % x         # y =  4 % 3 => y = 1
print(y)          # 1
```

```
11
4
1
```

In [3]:
```
# Solución
# A
```

Question 2 (Control Flow)

How many stars will the following code print to the monitor?

```
x = 1
while x < 10:
    print('*')
    x = x << 1 # a * 2^n
```

A. four

B. two

C. eight

D. one

Solution 2

In [5]:
```
x = 1
while x < 10:
    print('*')
    x = x << 1 # a * 2^n
    # x = 1 * 2¹ = 2 --> *
    # x = 2 * 2¹ = 4 --> *
    # x = 4 * 2¹ = 8 --> *
    # x = 8 * 2¹ = 16 --> *

# 0000 0001    (1 decimal)
# 0000 0010    (2 decimal)
# 0000 0100    (4 decimal)
# 0000 1000    (8 decimal)

# 0001 0000    (16 decimal) fuera de rango
```

```
*
*
*
*
```

In [6]:
```
# Solución
# A
```

Question 3 (Operators)

Consider the following code.

```
x = 1
x = x == x
```

The value eventually assigned to x is equal to:

A. `1`

B. `False`

C. `True`

D. `0`

Solution 3

In [8]:
```
x = 1
x = x == x
# x = 1==1
# x = True
print(x)
```

```
True
```

In [9]:
```
# Solución
# C
```

Question 4 (Data Aggregates)

What is the expected output of the following code?

```
data = {'1': '0', '0': '1'}

for d in data.vals():
    print(d, end=' ')
```

A. `0 0`

B. `1 0`

C. `0 1`

D. The code is erroneous

Solution 4

In [1]:
```
data = {'1': '0', '0': '1'}

for d in data.vals():
    print(d, end=' ')
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
/home/isabelmaniega/Documentos/PCEP/PCEP/soluciones/PCEP_TEST_3_RESUELTO.ipynb Cell 24 line 3
      <a href='vscode-notebook-cell:/home/isabelmaniega/Documentos/PCEP/PCEP/soluciones/PCEP_TEST_3_RESUELTO.ipynb#X32sZmlsZQ%3D%3D?line=0'>1</a> data = {'1': '0', '0': '1'}
----> <a href='vscode-notebook-cell:/home/isabelmaniega/Documentos/PCEP/PCEP/soluciones/PCEP_TEST_3_RESUELTO.ipynb#X32sZmlsZQ%3D%3D?line=2'>3</a> for d in data.vals():
      <a href='vscode-notebook-cell:/home/isabelmaniega/Documentos/PCEP/PCEP/soluciones/PCEP_TEST_3_RESUELTO.ipynb#X32sZmlsZQ%3D%3D?line=3'>4</a> print(d, end=' ')

AttributeError: 'dict' object has no attribute 'vals'
```

In [12]:
```
# Solución
# D
```

la solución que sería correcta

In [13]:
```
# esto sería correcto

data = {'1': '0',
        '0': '1'}

for d in data.values():
    print(d, end=' ')   # 0 1
```

```
0 1
```

Question 5 (Functions)

What is the output of the following snippet?

```
def fun(in=2, out=3):
    return in * out

print(fun(3))
```

A. The snippet is erroneous (invalid syntax)

B. `6`

C. `9`

Solution 5

In [4]:
```
"""def fun(in=2, out=3):
    return in * out
```

```
print(fun(3))"""

# SyntaxError: invalid syntax
```

```
  Cell In[4], line 1
    def fun(in=2, out=3):
            ^
SyntaxError: invalid syntax
```

In [16]:
```
# Solución
# A
```

Question 6 (Data types)

What is the decimal value of the following binary number?

```
1010
```

A. `12`

B. `8`

C. `4`

D. `10`

Solution 6

In [18]:
```
# 1010 --> 10 EN DECIMAL
```

In [19]:
```
# Solución
# D
```

Question 7 (Data types)

What is the expected output of the following code?

```
data = 'abbabadaadbbaccabc'
print(data.count('ab', 1))
```

A. `3`

B. `5`

C. `4`

D. `2`

Solution 7

In [21]:
```
data = 'abbabadaadbbaccabc'
print(data.count('ab', 1))

# 1 es start, con lo cual, no entra la primera 'a'
```

```
2
```

In [22]:
```
# Solución
# D
```

motivo del resultado

In [23]:
```
# data.count?
```

In [24]:
```
data = 'abbabadaadbbaccabc'
print(data.count('ab'))
```

```
3
```

In [25]:
```
data = 'abbabadaadbbaccabc'
print(data.count('ab', 1, 2))    # string, start, end
```

```
0
```

In [26]:
```
data = 'abbabadaadbbaccabc'
print(data.count('ab', 1, 4))
```

```
0
```

In [27]:
```
data = 'abbabadaadbbaccabc'
print(data.count('ab', 1, 5))
```

```
1
```

Question 8 (Basics)

Which of the following variable names is illegal?

A. TRUE

B. tRUE

C. true

D. True

Solution 8

In [29]:
```
# True es palabra reservada
```

In [30]:
```
a = True
a
```

Out[30]:
```
True
```

In [31]:
```
# Solución
# D
```

Question 9 (Error Handling)

What is the output of the following code?

```
try:
    value = input("Enter a value: ")
    print(value/value)
except ValueError:
    print("Bad input...")
except ZeroDivisionError:
    print("Very bad input...")
except TypeError:
    print("Very very bad input...")
except:
    print("Booo!")
```

A. `Very bad input...`

B. `Booo!`

C. `Very very bad input...`

D. `Bad input...`

Solution 9

In [33]:
```
s1 = 'casa'
s2 = 'casa'
# s1/s2
# TypeError:
# unsupported operand type(s) for /: 'str' and 'str'
```

In [34]:
```
try:
    value = input("Enter a value: ")
    print(value/value)
except ValueError:
    print("Bad input...")
except ZeroDivisionError:
    print("Very bad input...")
except TypeError:
```

```
    print("Very very bad input...")
except:
    print("Booo!")

# TypeError..
```

```
Enter a value: casa
Very very bad input...
```

In [35]:
```
# Solución
# C
```

Question 10 (Control flow)

How many stars will the following code print to the monitor?

```
i = 0
while i < i + 2:
    i += 1
    print('*')
else:
    print('*')
```

A. two

B. The snippet will enter an infinite loop

C. zero

D. one

Solution 10

In [37]:
```
"""i = 0
while i < i + 2:
    i += 1
    print('*')
else:
    print('*')"""
```

Out[37]:
```
"i = 0\nwhile i < i + 2:\n    i += 1\n    print('*')\nelse:\n    print
('*')"
```

In [38]:
```
# Solución
# B
```

Question 11 (Functions)

What is the expected output of the following code?

```
data = {}

def func(d, key, value):
    d[key] = value

print(func(data, '1', 'Peter'))
```

A. `Peter`

B. `1`

C. The code is erroneous

D. `None`

E. `value`

Solution 11

In [40]:
```
data = {}

def func(d, key, value):
    d[key] = value

print(func(data, '1', 'Peter'))
```

```
None
```

In [41]:
```
# Solución
# D
```

solución al problema: retorno el diccionario

In [42]:
```
data = {}

def func(d, key, value):
    d[key] = value
    return d
    # retorno el diccionario, d
    # que contiene:
    # {'1': 'Peter'}

print(func(data, '1', 'Peter'))
```

```
{'1': 'Peter'}
```

Question 12 (Functions)

What is the expected output of the following code?

```
num = 1

def func():
    num = 3
    print(num, end=' ')

func()

print(num)
```

A. `1 1`

B. The code is erroneous

C. `1 3`

D. `3 3`

E. `3 1`

Solution 12

In [44]:
```
num = 1

def func():
    num = 3
    print(num, end=' ') # 3

func()

print(num) # 1

# porque num en la función no es global

# 3 1
```

```
3 1
```

In [45]:
```
# Solución
# E
```

Question 13

The `+=` operator, when applied to strings, performs:

A. Subtraction

B. Concatenation

C. Multiplication

Solution 13

In [47]:
```
s1 = 'Jose'
s2 = 'Manuel'

s1 += s2
print(s1)
```

```
JoseManuel
```

In [48]:
```
# Solución
# B
```

Question 14 (Control Flow)

How many stars (`*`) will the following code output to the screen?

```
n = 1
if n == 1:
    print("*")
if n == True:
    print("**")
if n == False:
    print("***")
```

A. three

B. six

C. one

D. two

Solution 14

In [50]:
```
n=1
if n==True:
    print('true')
```

```
true
```

In [51]:
```
n=0
if n==False:
    print('false')
```

```
false
```

In [52]:
```
n=2
if n==True:
    print('n es 2')
```

```
else:
    print('no ejecuta nada')
```

```
no ejecuta nada
```

In [53]:
```
# el propio ejercicio
```

In [54]:
```
n = 1
if n == 1:
    print("*")
if n == True:
    print("**")
if n == False:
    print("***")
```

```
*
**
```

In [55]:
```
# Solución
# A
```

Question 15 (Data Aggregates)

Take a look at the snippet and choose one of the following statements which is true:

```
nums = []
vals = nums[:]
vals.append(1)
```

A. nums is longer than vals

B. vals is longer than nums

C. nums and vals are of the same length

Solution 15

In [3]:
```
nums = []
vals = nums[:]
vals.append(1)

print('nums: ', nums, 'vals: ', vals)
```

```
nums:  [] vals:  [1]
```

In [58]:
```
# Solución
# B
```

ejemplos similares

In [59]:
```
# ejemplo 1: quitamos los ":"
```

In [60]:
```
nums = []
vals = nums
vals.append(1)

print('nums: ', nums, 'vals: ', vals)
```

```
nums:  [1] vals:  [1]
```

In [61]:
```
# ejemplo 2: algo similar con mas elementos
```

In [62]:
```
numeros = [10,20,30]
valores = numeros[:]
print('numeros inicial: ', numeros)
print('valores inicial: ', valores)
print("\n")
valores.append(40)
print('numeros final: ', numeros)
print('valores final: ', valores)
```

```
numeros inicial:  [10, 20, 30]
valores inicial:  [10, 20, 30]


numeros final:  [10, 20, 30]
valores final:  [10, 20, 30, 40]
```

Question 16 (Functions)

Which of the following function headers is correct?

A. `def func(a=1, b):`

B. `def func(a=1, b, c=2):`

C. `def func(a=1, b=1, c=2):`

D. `def func(a=1, b=1, c=2, d):`

Solution 16

In [4]:
```
def func(a=1, b):
    return a + b
func(2, 6)
```

```
  Cell In[4], line 1
    def func(a=1, b):
                ^
SyntaxError: non-default argument follows default argument
```

In [6]:
```
def func(a, b=1):
    return a + b
func(2, 5)
```

Out[6]: 7

In [7]:
```
def func(a, b, c, d=1):
    return a + b+ c+d
func(2, 5, 3)
```

Out[7]: 11

In [64]:
```
def func(a=1, b=1, c=2):
    return a+b+c
func()


# se ha hecho el ejemplo
```

Out[64]: 4

In [65]:
```
# Solución
# C
```

Question 17 (Basics)

Which of the following variable names are illegal and will cause the SyntaxError exception?

(Select two answers)

A. in

B. print

C. In

D. for

Solution 17

In [67]:
```
# v1 = in
# v1

# SyntaxError: invalid syntax
```

In [68]:
```
v2 = print
v2
```

Out[68]: <function print>

In [69]:
```
# v3 = for
# v3
```

```
# SyntaxError: invalid syntax
```

In [70]:
```
# Solución
# A y D
```

nota

la opción b debería ser también no posible.

pero reconoce que print es, en su uso, print()

con los paréntesis incluído.

Question 18 (Control Flow)

Consider the following code.

```
for n in range(1, 6, 1):
    print(??? * 5)
```

What would you insert instead of ??? so that the program prints the following pattern to the monitor?

```
11111
22222
33333
44444
55555
```

A. `str(n)`

B. `-1`

C. `1`

D. `-2`

E. `n`

Solution 18

In [72]:
```
for n in range(1, 6, 1):
    print(str(n) * 5)
```

```
11111
22222
33333
44444
55555
```

In [73]:
```
# Solución
# A
```

NOTA: EJEMPLO SIMILAR, PERO NO EL MISMO

In [74]:
```
for n in range(1, 6, 1):
    print(n * 5)
```

```
5
10
15
20
25
```

Question 19 (Basics)

What is the expected output of the following code?

```
x = '\\\\'
print(len(x))
```

A. `2`

B. `1`

C. `4`

D. The code is erroneous

Solution 19

In [76]:
```
x = '\\\\'
print(len(x))
```

```
2
```

In [77]:
```
# Solución
# A
```

Question 20 (Basics)

UTF-8 is...

A. an encoding form of the Unicode Standard

B. a Python version name

C. the 9th version of the UTF-Standard

D. a synonym for "byte"

Solution 20

In [79]:
```
# Solución
# A
```

Question 21 (Data Types)

What is the expected output of the following code?

```
print('Peter' 'Wellert')
```

A. `Wellert`

B. The code is erroneous

C. `Peter`

D. `PeterWellert`

Solution 21

In [81]:
```
print('Peter' 'Wellert')
```

```
PeterWellert
```

In [82]:
```
# Solución
# D
```

ejercicios parecidos

In [83]:
```
print('Peter','Wellert')
```

```
Peter Wellert
```

In [84]:
```
print('Peter', 'Wellert')
```

```
Peter Wellert
```

Question 22 (Operators)

Which of the following statements is false?

A. Multiplication precedes addition

B. The ** operator has right-to-left associativity

C. The right argument of the % operator can not be zero

D. The result of the / operator is always an integer value

Solution 22

In [86]:
```
5/2
```

Out[86]: 2.5

In [87]:
```
# Solución
# D
```

Question 23 (Data Types)

What is the expected output of the following code?

```
print(chr(ord('z') - 2))
```

A. `z`

B. `x`

C. `y`

D. `a`

Solution 23

In [89]:
```
print(chr(ord('z') - 2))  # x <== y <== z
```

x

In [2]:
```
ord('z')
```

Out[2]: 122

In [3]:
```
chr(120)
```

Out[3]: 'x'

In [90]:
```
# Solución
# B
```

Question 24 (Basics)

What is the expected output of the following code?

```
x = """
"""
print(len(x))
```

A. `0`

B. `1`

C. `2`

D. The code is erroneous

Solution 24

In [92]:
```
x = """
"""
print(len(x))   # 1 (salto de línea)
```

1

In [93]:
```
# Solución
# B
```

Question 25 (Operators)

What is the output of the following code?

```
a = 10
b = 20
c = a > b
print(not(c))
```

A. The program will cause an error

B. `True`

C. `False`

D. `None`

Solution 25

In [95]:
```
a = 10
b = 20
c = a > b       # c = 10 > 20 => c = False
print(not(c))   # not(False) => True
```

```
True
```

In [96]:
```
# Solución
# B
```

Question 26 (Operators)

What is the expected output of the following code?

```
x = 1 + 1 // 2 + 1 / 2 + 2
print(x)
```

A. `4`

B. `3.5`

C. `3`

D. `4.0`

Solution 26

In [98]:
```
x = 1 + 1 // 2 + 1 / 2 + 2

# x = 1 + (1 // 2) + (1 / 2) + 2
# x = 1 +    0     +   0.5   + 2
# x =
print(x)   # 3.5
```

```
3.5
```

In [99]:
```
# Solución
# B
```

Question 27 (Control Flow)

How many stars will the following code send to the monitor?

```
x = 0
while x < 6:
    x += 1
    if x % 2 == 0:
        continue
    print('*')
```

A. three

B. two

C. zero

D. one

Solution 27

In [101…
```
x = 0
while x < 6:        # 0, 1, 2, 3, 4, 5
    x += 1          # x = x + 1
    if x % 2 == 0:  # 0, 2, 4
        continue    # no hace nada
    print('*')      # 1,3,5  --> 3 *
```

*
*
*

In [102…
```
# Solución
# A
```

Question 28 (Operators)

What is the expected output of the following code?

```
print(1 / 1)
```

A. `1.0`

B. `1`

C. This can not be predicted

D. This can not be evaluated

Solution 28

In [104…
```
print(1 / 1)
```

```
1.0
```

In [105…
```
# Solución
# A
```

Question 29 (Functions)

Which of the following function calls can be used to invoke

the below function definition? choose three

```
def test(a, b, c, d):
```

A. `test(a=1, 2, c=3, 4)`

B. `test(1,2,3,4)`

C. `test(a=1, 2,3,4)`

D. `test(a=1, b=2, c=3, 4)`

E. `test(a=1, b=2, c=3, d=4)`

F. `test(1, 2, 3, d=4)`

Solution 29

In [107…
```
def test(a, b, c, d):
    return a+b+c+d
```

In [108…
```
# A
# test(a=1, 2, c=3, 4)

# SyntaxError: positional argument follows keyword argument
```

In [109…
```
# B
test(1,2,3,4)
```

Out[109… 10

In [8]:
```
# C
# test(a=1,2,3,4)

# SyntaxError: positional argument follows keyword argument
```

In [111…
```
# D
# test(a=1, b=2, c=3, 4)
```

```
# SyntaxError: positional argument follows keyword argument
```

In [112…
```
# E
test(a=1, b=2, c=3, d=4)
```

Out[112… 10

In [113…
```
# F
test(1, 2, 3, d=4)
```

Out[113… 10

In [114…
```
# Solución
# B, E y F
```

otros ejemplos más

vemos que cuando uno indica la variable, de ahi a la derecha, no reconoce si no lo indicas

In [115…
```
# SyntaxError: positional argument follows keyword argument

# test(1, 2, c=3, d)
```

In [116…
```
# este si que funciona

test(1, 2, c=3, d=4)
```

Out[116… 10

Question 30 (Control Flow)

How many stars will the following snippet print to the monitor?

```
i = 0
while i <= 5:
    i += 1
    if i % 2 == 0:
        break
    print('*')
```

A. three

B. two

C. one

D. zero

Solution 30

In [118…
```
i = 0
while i <= 5:           # 0, 1, 2, 3, 4, 5
    i += 1              # i = i + 1 => empieza con 1
    if i % 2 == 0:      # en el 2 ya salta
        break
    print('*')          # imprime 1 *
```

```
*
```

In [119…
```
# Solución
# C
```

Gracias por la atención

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