```
#Lab 8 solutions
#Q1: a, b, e, f are valid

#Q2:
#(a)
#x=13.0 y=4
# x//y=13.0//4=3.0, x/y=3.25,x%y=1.0 watch for decimal point.

#(b)
#range(3)-> 0,1,2
#my_list=[0,2**0,2**1,2**2] = [0,1,2,4]

#(c)
x, y = -1, 19
def f(x):
    y, z = 1, 1
    while y < x:
        y, z = y * 2, y
    return z

print(f(x), f(y))

#x=-1, y=19
#f(x)=f(-1)
#x=-1, y=1, z=1
#is y(1) < x(-1): No, return z=1 so f(-1)=1
#f(y)=f(19)
#x=19, y=1, z=1
#is y(1) < x(19): yes
#iteration-1: y=y*2=2, z=1 -- takes the value of y before.
#is y(2) < x(19): yes
#iteration-2: y=y*2=4, z=2
#is y(4) < x(19): yes
#iteration-3: y=y*2=8, z=4
#is y(8) < x(19): yes
#iteration-4: y=y*2=16, z=8
#is y(16) < x(19): yes
#iteration-5: y=y*2=32, z=16
#is y(32) < x(19): no return z=16 so f(19)=16
#prints 1 16

#(d)
text = "To be or not to be"
print(text.split()[:: -2]) #reversing the list-skips every second word
#text.split()=['To','be','or','not','to','be']
#prints ['be','not','be'] # slice is also a list

#(e)
array = [5,4,3,2,1]
s = 0
for n in array [::2]:
    s += n
print(s)
# for loop iterating over [5,3,1] - skips every second item
#prints 9

#(g)
x, y, z = [0],"0",0 # y is the digit 0
print(bool(x and y[0]) or z, z and not y or bool(x))
#x=[0] True, y="0" True, z=0 False, y[0]="0" True
#bool(x and y[0]) or z = bool(T and T) or F = T or F = T
#z and not y or bool(x) = F and not T or T = F or T = T
#prints True True

#(h)
x, y, z = [], [0], True
print(x and y[0] or z, z and not y or bool(x))
#x=[] False, y=[0] True, z=True, y[0] = 0 False
#x and y[0] or z = F and F or T = F or T = T
#z and not y or bool(x) = T and not T or F = T and F or F = F or F = F
#prints True False

#(i)
x = [9, 1, 0]
y = x
y.clear()
print(x)

#y=[9, 1, 0]
#y.clear() ==> y= [] x is alias to y so x=[]
#prints []

#(j)
y = []
for v in range(0, 30, 5):
    y.append(v % 2 != 0)
print(all(y))
#6 iterations! range((0, 30, 5): 0,5,10,15,20,25
#Iteration-1:  y = [],                v=0, v%2=0,y.append(False), y=[False]
#Iteration-2:  y = [False],           v=5, v%2=1,y.append(True),  y=[False,True]
#Iteration-3:  y = [False,True],      v=10,v%2=0,y.append(False), y=[False,True,False]
#Iteration-4:  y = [False,True,False],v=15,v%2=1,y.append(True),  y=[False,True,False,True]
#Iteration-5:  y=[False,True,False,True,False]
#Iteration-6:  y=[False,True,False,True,False,True]
#All(y) = False
#prints False

#(k)
L = [3 ,6 ,8 ,10 ,11]
total = 1
while L:
    total = total * L[-1]
    L.pop()
print(total /5)
#5 iterations: total=1*11*10*8*6*3=15840 total/5=15840/5=3168.0
#prints 3168.0

#Q3
def check_card_number(x):
    if len(x) != 16:
        return False
    elif not x.isdigit():
        return False
    else:
        sum_digits=0
        for d in x:
            sum_digits += int(d)
        if sum_digits % 2 == 0:
            return True
        else:
            return False

cc1 = '5191241074527994' # sum is 70
cc2 = '5191241076621233' # sum is 53
cc3 = '51912410C6621233'
print(check_card_number(cc1)) #prints True
print(check_card_number(cc2)) #prints False
print(check_card_number(cc3)) #prints False

#Q4
def count_capitalized(text):
    word_list = text.split()
    count=0
    for word in word_list:
        if word[0].isupper():
            count+=1
    return count

str1 = "Our Home and Native Land"
print(count_capitalized(str1)) #prints 4
str2 = "On Oct 10, a wedding in British Colombia has led to 49 COVID 19 cases"
print(count_capitalized(str2)) #prints 5
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