hw03

September 7, 2022

1 hw03

1.1 Metadata

```
Name:    hw02
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Course:  DS 5100
Term:    Fall 2022 Online
Module:  M03: Control Structures
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```

1.2 Tasks

1.2.1 Task 1

(6 points)

Using the `for` loop and `if` statement control structures, write a script that generates the integers from 1 to 100 and does the following things: * If 3 is a factor of the number, print `Wahoo`. * If 5 is a factor of the number, print `wah!`. * If the number meets none of the above conditions, print nothing, not even a line break. * If the number meets both of the conditions, print the strings on the same line with no space between them. * Make sure that the line printed for each iteration in which a condition is met ends with a line break. * When the loop is finished, print the number of times either condition was met (i.e., the number of lines that were printed).

[1]:
```
path = 'printed_output.txt'
import os
if os.path.isfile(path):
    os.remove(path)

wahoo = 'Wahoo'
wah = 'wah!'
with open('printed_output.txt', 'w') as printed_output:
    for i in range(1, 100 + 1):
        if i % 3 == 0: # 3 is a factor of i if the remainder of i when divided␣
 ↪by 3 is 0 / if i modulo 3 is 0.
```

```
            print(wahoo, file = printed_output)
        if i % 5 == 0:
            print(wah, file = printed_output)
        if (i % 3 != 0) and (i % 5 != 0):
            pass
        if (i % 3 == 0) and (i % 5 == 0):
            print(wahoo + wah, file = printed_output)

for i in range(1, 100 + 1):
    if i % 3 == 0:
        print(str(i) + ',3,-,' + wahoo)
    if i % 5 == 0:
        print(str(i) + ',-,5,' + wah)
    if (i % 3 != 0) and (i % 5 != 0):
        print(str(i) + ',-,-,-')
    if (i % 3 == 0) and (i % 5 == 0):
        print(str(i) + ',3,5,' + wahoo + wah)

with open('printed_output.txt', 'r') as printed_output:
    number_of_lines_printed = 0
    for line in printed_output:
        if '\n' not in line:
            assert(False);
        number_of_lines_printed += 1
    print(str(number_of_lines_printed) + ' lines were printed. Each line␣
 ↪printed ends with a line break.')

os.remove(path)
```

```
1,-,-,-
2,-,-,-
3,3,-,Wahoo
4,-,-,-
5,-,5,wah!
6,3,-,Wahoo
7,-,-,-
8,-,-,-
9,3,-,Wahoo
10,-,5,wah!
11,-,-,-
12,3,-,Wahoo
13,-,-,-
14,-,-,-
15,3,-,Wahoo
15,-,5,wah!
15,3,5,Wahoowah!
16,-,-,-
17,-,-,-
```

```
18,3,-,Wahoo
19,-,-,-
20,-,5,wah!
21,3,-,Wahoo
22,-,-,-
23,-,-,-
24,3,-,Wahoo
25,-,5,wah!
26,-,-,-
27,3,-,Wahoo
28,-,-,-
29,-,-,-
30,3,-,Wahoo
30,-,5,wah!
30,3,5,Wahoowah!
31,-,-,-
32,-,-,-
33,3,-,Wahoo
34,-,-,-
35,-,5,wah!
36,3,-,Wahoo
37,-,-,-
38,-,-,-
39,3,-,Wahoo
40,-,5,wah!
41,-,-,-
42,3,-,Wahoo
43,-,-,-
44,-,-,-
45,3,-,Wahoo
45,-,5,wah!
45,3,5,Wahoowah!
46,-,-,-
47,-,-,-
48,3,-,Wahoo
49,-,-,-
50,-,5,wah!
51,3,-,Wahoo
52,-,-,-
53,-,-,-
54,3,-,Wahoo
55,-,5,wah!
56,-,-,-
57,3,-,Wahoo
58,-,-,-
59,-,-,-
60,3,-,Wahoo
60,-,5,wah!
```

```
60,3,5,Wahoowah!
61,-,-,-
62,-,-,-
63,3,-,Wahoo
64,-,-,-
65,-,5,wah!
66,3,-,Wahoo
67,-,-,-
68,-,-,-
69,3,-,Wahoo
70,-,5,wah!
71,-,-,-
72,3,-,Wahoo
73,-,-,-
74,-,-,-
75,3,-,Wahoo
75,-,5,wah!
75,3,5,Wahoowah!
76,-,-,-
77,-,-,-
78,3,-,Wahoo
79,-,-,-
80,-,5,wah!
81,3,-,Wahoo
82,-,-,-
83,-,-,-
84,3,-,Wahoo
85,-,5,wah!
86,-,-,-
87,3,-,Wahoo
88,-,-,-
89,-,-,-
90,3,-,Wahoo
90,-,5,wah!
90,3,5,Wahoowah!
91,-,-,-
92,-,-,-
93,3,-,Wahoo
94,-,-,-
95,-,5,wah!
96,3,-,Wahoo
97,-,-,-
98,-,-,-
99,3,-,Wahoo
100,-,5,wah!
59 lines were printed. Each line printed ends with a line break.
```

1.3 Task 2

(3 points)

Rewrite the `for` loop as a `while` loop. This time, only print lines where both conditions are met. Include a final line which prints the number of times both conditions are met.

[2]:
```
i = 1
number_of_lines_printed = 0
while i <= 100:
    i += 1
    if (i % 3 == 0) and (i % 5 == 0):
        print(wahoo + wah)
        number_of_lines_printed += 1
print(number_of_lines_printed)
```

```
Wahoowah!
Wahoowah!
Wahoowah!
Wahoowah!
Wahoowah!
Wahoowah!
6
```

1.4 Task 3

Write a list comprehension that iterates through the integers from 1 to 100 and returns a list containing the sum of the boolean values of the two conditions described in Task 1.

[3]:
```
list_of_sums_of_boolean_values = [(i % 3 == 0) + (i % 5 == 0) for i in range(1,␣
↪100 + 1)]
_ = [print(str(i) + ',' + str(i % 3 == 0) + ',' + str(i % 5 == 0) + ',' +␣
↪str(list_of_sums_of_boolean_values[i - 1])) for i in range(1, 100 + 1)]
```

```
1,False,False,0
2,False,False,0
3,True,False,1
4,False,False,0
5,False,True,1
6,True,False,1
7,False,False,0
8,False,False,0
9,True,False,1
10,False,True,1
11,False,False,0
12,True,False,1
13,False,False,0
14,False,False,0
15,True,True,2
16,False,False,0
```

```
17,False,False,0
18,True,False,1
19,False,False,0
20,False,True,1
21,True,False,1
22,False,False,0
23,False,False,0
24,True,False,1
25,False,True,1
26,False,False,0
27,True,False,1
28,False,False,0
29,False,False,0
30,True,True,2
31,False,False,0
32,False,False,0
33,True,False,1
34,False,False,0
35,False,True,1
36,True,False,1
37,False,False,0
38,False,False,0
39,True,False,1
40,False,True,1
41,False,False,0
42,True,False,1
43,False,False,0
44,False,False,0
45,True,True,2
46,False,False,0
47,False,False,0
48,True,False,1
49,False,False,0
50,False,True,1
51,True,False,1
52,False,False,0
53,False,False,0
54,True,False,1
55,False,True,1
56,False,False,0
57,True,False,1
58,False,False,0
59,False,False,0
60,True,True,2
61,False,False,0
62,False,False,0
63,True,False,1
64,False,False,0
```

```
65,False,True,1
66,True,False,1
67,False,False,0
68,False,False,0
69,True,False,1
70,False,True,1
71,False,False,0
72,True,False,1
73,False,False,0
74,False,False,0
75,True,True,2
76,False,False,0
77,False,False,0
78,True,False,1
79,False,False,0
80,False,True,1
81,True,False,1
82,False,False,0
83,False,False,0
84,True,False,1
85,False,True,1
86,False,False,0
87,True,False,1
88,False,False,0
89,False,False,0
90,True,True,2
91,False,False,0
92,False,False,0
93,True,False,1
94,False,False,0
95,False,True,1
96,True,False,1
97,False,False,0
98,False,False,0
99,True,False,1
100,False,True,1
```

[ ]: