Metadata

```
Course:   DS 5100
Term:     Spring 2024
Module:   M03 Homework
Author:   R.C. Alvarado
Date:     08 February 2024 (revised)
```

Student Info

- Name: Alanna Hazlett
- Net ID: uwa6xv
- URL of this file in GitHub: https://github.com/AlannaHazlett/DS5100--uwa6xv-/tree/main/lessons/M03

Instructions

In your **private course repo on Rivanna**, write a Jupyter notebook running Python that performs the numbered tasks below.

For each task, create a code cell to perform the task.

Save your notebook in the `M03` directory as `hw03.ipynb`.

Add and commit these files to your repo.

Then push your commits to your repo on GitHib.

Be sure to fill out the **Student Info** block above.

To submit your homework, save the notebook as a PDF and upload it to GradeScope, following the instructions.

12 points

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 but 5 is not, print `Wahoo`.
- If 5 is a factor of the number but 3 is not, print `wah!`.
- If both 3 and 5 are factors of the number, print `Wahoowah!`.
- If the number meets none of the above conditions, print nothing, not even a line break.
- 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 conidtion was met, i.e. the number of lines that were printed.

Hint: You may not need to use **elif** and **else** to accomplish these tasks.

In [80]:
```
counter = 0
count3 = 0
count5 = 0
count3_5 = 0
for num in range(1,101):
    if num % 3 == 0 and num % 5 != 0:
        print("Wahoo")
        count3 += 1
        counter += 1
    if num % 5 == 0 and num % 3 != 0:
        print("wah!")
        count5 += 1
        counter += 1
    if num % 3 == 0 and num % 5 ==0:
        print("Wahoowah!")
        count3_5 += 1
        counter += 1
print("There are " + str(count3) + " numbers that are multiples of only 3.")
print("There are " + str(count5) + " numbers that are multiples of only 5.")
print("There are " + str(count3_5) + " numbers that are multiples of 3 and 5
print("Total true values is " + str(counter))
```

```
Wahoo
wah!
Wahoo
Wahoo
wah!
Wahoo
Wahoowah!
Wahoo
wah!
Wahoo
Wahoo
wah!
Wahoo
Wahoowah!
Wahoo
wah!
Wahoo
Wahoo
wah!
Wahoo
Wahoowah!
Wahoo
wah!
Wahoo
Wahoo
wah!
Wahoo
Wahoowah!
Wahoo
wah!
Wahoo
Wahoo
wah!
Wahoo
Wahoowah!
Wahoo
wah!
Wahoo
Wahoo
wah!
Wahoo
Wahoowah!
Wahoo
wah!
Wahoo
Wahoo
wah!
There are 27 numbers that are multiples of only 3.
There are 14 numbers that are multiples of only 5.
There are 6 numbers that are multiples of 3 and 5.
Total true values is 47
```

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.

In [33]:
```
x = 1
list3_5=[]
while x in range(1,101):
    if x % 3 == 0 and x % 5 == 0:
        list3_5.append("Multiple of 3 and 5")
        print("Wahoowah!")
    x += 1
print(list3_5.count("Multiple of 3 and 5"))
```

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

Task 3

(3 points)

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 three conditions described in Task 1.

In [107…
```
# Uses all three boolean values and returns list of 3 values
total = [sum(num % 3 == 0 and num % 5 != 0 for num in range(1,101)),
        sum(num % 5 == 0 and num % 3 != 0 for num in range(1,101)),
        sum(num % 3 == 0 and num % 5 == 0 for num in range(1,101))]
print(total)
print(sum(total))

# Returns single value only using 2 booleans
x = [sum(i % 3 == 0 or i % 5 == 0 for i in range(1,101))]
print(x)
```

```
[27, 14, 6]
47
[47]
```

In [ ]:
```
```