Unit 3: Conditions, If and While — Application: FizzBuzz

In this Application, you will write a program to illustrate the amazing **"FizzBuzz"** phenomenon!

Objectives:

- Make a **while** loop that terminates in two ways
- Define a function that examines numbers for "divisibility"

FizzBuzz

Write a program to print some of the natural numbers (1,2,3, …), but …

- If the number is divisible by 3, print "Fizz" instead
- If the number is divisible by 5, print "Buzz" instead
- If the number is divisible by both 3 and 5, print "FizzBuzz" instead

Other requirements: The program should end when the escape key is pressed.

"Divisibility" is tested using the % operator (**mod** or remainder).
When **a % b == 0** the *remainder* when **a** is divided by **b** is zero. Thus, **a** is divisible by **b**. Try some examples in the Shell:

```
>>>13%5
3
>>>8%2
0
```

There is one other form of the **if** statement you will find useful:

if *<condition1>*:
    <true block1>

elif *<condition2>*: *there can be many* **elif** *blocks*
    <true block2> **elif** *is short for "else if"*
<more elifs?>

else:
    <false block> this block is processed when none of the others are true.

1. Begin a new Python blank program file. We named it FIZZBUZZ.
   #: It always helps to write a comment at the top of the code explaining the program. You may want to add your name and date here, too.

   You will use the **escape()** function to end the program so add

   from ti_system import *
   while not escape():

   which are both found on **<Fns…> Modul> ti_system**.

2. Before the **while** loop, set up a variable that represents the counting numbers starting with 1.

3. Use the **if..elif..else** structure found on **<Fns…> Ctl**.

   Remember that it works like this:

   if *<this is true>*:

   <do this>

   elif *<this is true>*: *(stands for "**else if**…")*

   <do this>

   *(there may be more **elif**s in here)*

   else:

   <do this> *(when none of the others are true)*

   *Caution: Remember to use **==** when writing a condition, not **=**. Using the wrong symbol will result in a syntax error: if **x==5:** not if **x=5:***

   Using the **[test]** *or* **<Fns…> Ops** *menu can help.*

4. Here is a peek at the **if .. elif .. else** structure, but some information has been omitted, so that you can try to write the code on your own.

   The **if** and each **elif** has a *condition* to be met and a code block to be processed when the condition is true. **else**: has no condition and its block will be processed when *none* of the others are true.

   counter+=1 is shorthand for **counter = counter + 1**.

   Hint: Recall that **A % B** gives the *remainder* when A is divided by B.so, for example, if **counter % 5 == 0** then the counter is divisible by 5 and "Buzz" will be printed.

   *The conditions and the **print(** statements in the image are incomplete.*

5. A run of the program should look something like the image to the right. If your numbers go by too fast, use a **sleep()** function in the loop to slow things down a bit.

   sleep() is in the **time** module so be sure to include:

   from time import *

   at the top of your code.

   What is the first number replaced by “fizzbuzz”?

Teacher Tip: sleep() is also included in the ti_system module but this is not standard Python.

Sample solution (note the *order* of the three conditions):