# CS0015 INTRODUCTION TO COMPUTER PROGRAMMING

while Loops

1.

```
count = 1
student_name = input('Enter student name ')
len_name = len(student_name)
print(student_name, 'has length', len_name)
student_name = input('Enter student name ')
len_name = len(student_name)
print(student_name, 'has length', len_name)
student_name = input('Enter student name ')
len_name = len(student_name)
print(student_name, 'has length', len_name)
student_name = input('Enter student name ')
len_name = len(student_name)
print(student_name, 'has length', len_name)
```

a. Rewrite the above program using a while loop (use the **count** variable to control the loop).

b. Rewrite the program in **part a** but start the **count** variable at 0.

2. Write a program using a loop to display the following table: (there are 2.54 cm in an inch)

| inches | cm |
|---|---|
| 1 | 2.54 |
| 2 | 5.08 |
| 3 | 7.62 |
| … | … |
| 10 | 25.40 |

3. Cobalt 60, a radioactive element, decays over a period of time. Every year, 12% of the amount present at the beginning of the year will have decayed.

Write programs (containing while loops) to solve the following problems:

a. If a container of cobalt 60 initially contains 10 grams, determine the amount remaining after 5 years.

b. If a container of cobalt 60 initially contains 100 grams, determine the number of years until the container contains 20 grams

**Example**

Summing a series of values and displaying the average:

```
count = 0
sum = 0
num = float(input('Enter a nonnegative number. Enter -1 to terminate. '))

while num != -1:
    count = count + 1
    sum = sum + num
    num = float(input('Enter a nonnegative number. Enter -1 to terminate. '))

if count > 0:
    average = sum/count
    print('Average =', format(average, '.2f'))
else:
    print('No numbers were entered')
```

**Notes:**

**count** is an example of a counter variable – it is used to count the number of times something occurs.

**sum** is an example of an accumulator variable – it is used to add a series of values

Both counters and accumulators are commonly used with loops.

The value of -1 is used to end the loop. If the first number entered is -1 then the loop will not execute. That is why the first prompt for input is BEFORE the loop.