**CS2302 Data Structures**

**Fall 2020**

**Recursion**

1. Write a **recursive** function that receives a string s and returns a string which only contains the vowel words in s.   
   *Challenge: make it return a string with only consonants*

* Dr. Fuentes à Dr. Fnts
* Recursion à Rcrsn
* Python à Pythn

1. Write a **recursive** function that receives an integer n and returns the sum of the first n integers.

* 1 à 1
* 3 à 6
* 4 à 10

1. Write a **recursive** function that receives an integer n and returns the sum of its even digits.
   * 121 à 2
   * 7496 à 10
   * 639472 à 12
2. Write a **recursive** function that receives a string s and checks if s is a palindrome or not.
   * ‘Ana’ à True
   * ‘Java’ à False
   * ‘Red rum, sir, is murder’ à True
   * ‘I did, did I?’ à True
   * ‘Palindrome’ à False
3. Write a **recursive** function that receives an integer a and an integer b and returns the product of a and b, in other words, a\*b. *However, you are not allowed to use the \* operator.*
   * Input: a = 2, b=3. Output: 8
4. A child is running up a staircase with n steps and can hop either 1 step, 2 steps, or 3 steps at a time. Write a **recursive** function that receives an integer n and counts how many possible ways the child can run up the stairs. ***(extra-credit, Dr. Fuentes & Dr. Aguirre)***
   * Input: n = 3. Output: 4
   * Input: n = 6. Output: 24
   * Input: n = 20. Output: 121415
5. Trace the following code using activation records
6. def f2(n):
7. n = n\*10
8. print(‘f2: n =’,n)
10. def f1(n):
11. k = n+1
12. f2(k)
13. print(‘f1: n = {}, k = {}’.format(n,k))
15. f1(3)
16. print('bye')