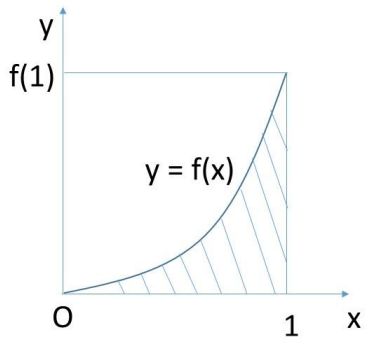
Vg101. Introduction to Computer and Programming (Fall 2018)

Homework #2

Assigned: 9/25/2018 Due: 10/9/2018

Notes for submission: Please submit ONE Matlab source file to Canvas for the problem. You need to name the file using the format "**sYourID_hw2.m**" in order to speed up our grading process. For example, the file submitted by the student with ID#518370900000 for this homework assignment should be "s518370900000_hw2.m". Also notice that you will be working with a Matlab function below, where the m-file name generally should be the same as the function name. You should stick to this rule during your testing of the codes. However, please remember to rename your file according to the above rule before submitting it to Canvas so that submissions from different people can be differentiated. And we will handle the inconsistency during the grading process.

Homework problem: Write a Matlab function to compute the area enclosed by a function y = f(x), the x-axis, and the line x = 1, which is shown as the shadowed region in the following figure. Here f(x) is a polynomial with f(0) = 0.



The function should have the following prototype:

function A = computeArea(fx)

where the output A is the computed area, and the input fx is a character string describing the polynomial. To make your life easier, you can assume that the degree of fx is not larger than 3 and fx will be described as '*ax3 + bx2 + cx*', which represents the polynomial $ax^3 + bx^2 + cx$. Let's further assume that a, b, c >= 0. Notice that it's possible that a, b, or c might be 0 or 1, and in this case, the corresponding terms or coefficients will not appear in the fx string. The followings are some example cases for fx: '*x3 + x2 + x*', '*1.2x3 + 2.3x2 +3.4x*', '*2x2 + x*', '*2.5x3 + x2*', '*x3 + x*', '*3.5x*', '*2x2*'. You can use the Monte Carlo method or any other method to solve this problem. However, your result shouldn't be deviated too much (>10%) from the exact area. For example, a function call of computeArea('*x2*') will return a number around 1/3 according to our lecture slide.