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Section: ENGR 102 - 401,451,501
Assignment: Lab 12 A Act 1 PDF
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A.   Bottom up design

#Start with user input the parameters that functions will need to work.

Take as input a list of strings (the coefficients). A new list of integer coefficients are returned.

Create a variable of x_Values to generate an interval from -5 to 5

Pass in a the y-values from creating original equation and return the local maxima and minima

#Next create functions

#Functions

Create a function that will convert a list of strings to integers. This function will be called converttoint. The function will return a list of integers instead of strings.

Create a function called derivative that will take in the list of strings to determine the derivative. Must account for constants.

Create a function to find the maxima and minima of the function. Name this function findmaxima_minima and take in the parameter of the y value. It will return the maxima and the minima.

Create a function to plot the maxima and minima of the function. The function will require the parameters of maxima, minima, the x and y values and color. The function should be able to determine if the maxima or the minima is equal to 0.

B.   Top Down Design

#The program will generate a plot of a curve, its derivative, and its second derivative from a user input of a polynomial.

#Take as input the polynomial from the user.

#Create functions that will determine the derivative of the polynomial.

-A function that will convert the list of strings to integers.

-A function that will calculate the derivative accounting for constants.

-A function that will find the maxima and the minima.

-A function to plot the maxima and minima.

#Plot the curve

- Plot the original, first derivative and second derivative function lines

- Plot characteristics of the function lines of the local maxima and minima

- A leaf for the for the function lines are the legend, creating the titles for the graph