AEM 685: Homework # 2

Due on 09/09/2015

Important: Please work independently.

Problem 1: Solve the following linear programming problem:

$$Maximize\ f = 13x_1 + 10x_2 + 8x_3 + 15x_4$$

$$\text{Sub to: } 2x_1 + 3x_2 + x_3 + 4x_4 \leq 100$$

$$75x_1 + 85x_2 + 65x_3 + 100x_4 \leq 5000$$

$$x_2 + x_4 \geq 10$$

$$x_1, x_2, x_3, x_4 \geq 0$$

(30 points)

Problem 2: For the optimization problem,

$$Minmize \quad f(x) = \sin(0.1 + 2\alpha)/(0.1 + \alpha)$$

$$Sub\ to\ \ 0 \leq \alpha \leq 10$$

Write Matlab program to bracket the minima and obtain lower and upper bounds. Optimize the objective function with quadratic and cubic polynomial approximation using three and four points. (30 points)

Problem 3: For the optimization problem defined in Problem 2, write Matlab program to utilize 'Golden Section method' to obtain the minima of the objective function. Use the lower and upper bounds obtained in Problem 2 which brackets the minima. (40 points)