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Student name:
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Due April 10, 2022
Assignment 2

Comp 206

Question 1

Prof Midas asks his students to write some software by using two computer languages, A and B. However, debugging the codes written by students can be burden. Thus, Prof Midas says if you write the code in A, your code cannot exceed 5000 lines and if you write the codes in B, you code cannot exceed 2000 lines. However, if you want to exchange some codes between these two language, you can write 5500 lines at most. If you are using language A, writing 1000 lines of code can take 5 hours. On the other hand, if you are using B, which is a scripted language, writing 1000 lines of code takes 2 hours. Eventually, Prof Midas produces two software and sell them with revenue of 200 $ for A and 175 $ for B. Then, formulate this problem as an optimization problem so that Prof Midas maximizes his profit.

Question 2

Now, imagine this "greedy" Prof Midas has two TAs, Pınar and Ali to debug the software written by students. Prof Minas asks TAs to debug 10000 lines of code from 8 AM till 5 PM. Pınar can debug 500 lines of code in an hour with %4 error rate, while Ali can debug 300 lines of code in an hour with %7 error rate. Prof Midas pays 50 Turkish lira per hours for Pınar and 30 Turkish lira per hour for Ali. Also, a mistake in the software cost 10 Turkish lira to Prof Midas, whom also has 4 female and 3 male TA position available. Now, formulate this problem an optimization problem so that Prof Minas minimizes his spending cost in this software development process.

Question 3

Write two Matlab code to solve Question 2 and 3. Plot the graphs and find all corner points. In the legend display the equations, i.e, lines should have different color. Shade the feasible area with green and blue in the plots for Q1 and Q2, respectively.

Question 4

A bakery shop produces two types of Ramadan Pide, plain and sesame breads. Bakery can buy at most a ton of wheat flour with price 5 Turkish Lira per kg. Fermentation machine costs 2 Turkish Lira electricity per kg for plain pide. And, the same fermentation machine consumes 3.5 electricity per kg of sesame pide. The bakery shop sells the plain pide with price of 15 Turkish Lira and gives 2 percent to Ramadan Charity. Also, the bakery shop sells the sesame pide with 25 Turkish Lira and gives 1 perfect of this sell to Ramadan Charity. Now, write an optimization problem to maximize this Bakery shop's profit. Discuss if it the optimization problem is linear or not linear.

percent

Question 5

Extra 10 points, you do not have to solve this quesiton
Write a Matlab code to plot Q4