The hand-in assignments

Science, Computer Science

HAND-IN ASSIGNMENT

Hand-in Assignments are one way for you to demonstrate your learning. The Hand-in Assignments provide an opportunity to apply concepts and strategies to an authentic context. Typically, Hand-in Assignments are written papers or computer programs that are submitted to the Instructor. They require you to pull together information from the weekly Learning Resources, the Discussion, and your own experiences to address an issue from the perspective of a real-world situation. Unless otherwise noted, the papers you write in Hand-in Assignments must followHarvardReferencing Style reference and citation guidelines. You must submit your answers to the following Hand-in Assignment (HA) questions by the end of Day 7 (Wednesday). Answers will be submitted to the weekly Assignments area, but are not to be posted in the module Discussion Board. Question 1 Activity Mean duration

Complete the following:

1. Calculate the project completion time.
2. Indicate the critical path activities.
3. What is the probability of completing this project between 38 and 40 days?
4. What are the slack values for activities C and F? Interpret the meaning of their slack values?

Question 2A registered nurse is trying to develop a diet plan for patients.

The required nutritional elements are the total daily requirements of each nutritional element as indicated in Table 2: Required nutritional element total

and daily requirements Calories Not more than 2, 700 calories Carbohydrates Not more than 300 grams Protein Not less than 250 grams Vitamins Not less than 60 units Table 2 The nurse has four basic types to use when planning the menus. The units of nutritional element per unit offoodtype are shown in Table 3 below. Note that the cost associated with a unit of the ingredient also appears at the bottom of Table 3.

Required nutritional element and units of nutritional elements per unit of food type

Element	Milk	Chicken	Bread	Vegetables
Calories	160	210	120	150
Carbohydrates	110	130	110	120
Protein	90	190	90	130
Vitamins	50	50	75	70
Cost per unit	0. 42	0. 68	0. 32	0. 17

Table 3. Moreover, due to dietary restrictions, the following aspects should also be considered when developing the diet plan:

1. The chicken food type should contribute at most 25% of the total caloric intake that will result from the diet plan.

2. The vegetable food type should provide at least 30% of the minimum daily requirements for vitamins.

Complete the following: Provide a linear programming formulation for the above case. (You do not need to solve the problem

INDIVIDUAL PROJECT

He purpose of this simulation project is to provide you with an opportunity to use the POM-QM for Windows software to solve a linear programming problem and perform sensitivity analysis.

POM-QM for Windows software for this part of this project, you will need to use the POM software:

1. Read Appendix IV of the Operations Management (Heizer & Render, 2011) textbook.
2. Install and launch the POM-QM for Windows software and from the main menu select Module.
3. Program the linear programming formulation for the problem below and solve it with the use of POM. Refer to Appendix IV from the Heizer and Render.

Note: Do not program the non-negativity constraint, as this is already assumed by the software. For additional support, please reference the POM-QM for Windows manual provided in this week’s Learning Resources. Individual Project problem A firm uses three machines in the manufacturing of three products: Each unit of product 1 requires three hours on machine 1, two hours on machine 2, and one hour on machine 3.

Each unit of product 2 requires four hours on machine 1, one hour on machine 2, and three hours on machine 3. Each unit of product 3 requires two hours on machine 1, two hours on machine 2, and two hours on machine 3. The contribution margin of the three products is 30, 40, and 35 per unit, respectively. Available for scheduling are: 90 hours of machine 1 time; 54 hours of machine 2 times; and 93 hours of machine 3 times.

The linear programming formulation of this problem is as follows: Maximise Z = 30X1 + 40X2 + 35X3 3X1 + 4X2 + 2X3