An-Najah National University
Faculty of IT
MIS Department
Decision Analysis
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جامعة النجاح الوطنية
كلية تكنولوجيا المعلومات
تحليل القرارات
قسم أنظمة المعلومات الإدارية
الامتحان الاول - عملي

الاسم: **الرقم:**

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(Important!! ***Create a new folder on your PC desktop using your complete name as the folder name. Use separate Excel file for each question as Q1.exls, Q2.xls, and any other file names will not be graded. Install SensIt , ensure to format mony value as appropriate – red if negative, with $ and 2 decimal places unless otherwise specified.***

Q1 [30 Points] :

An Investor wants to decide whether to invest an amount of $10000 for 3 years- in a bank or to buy shares in a stock Market. If he invested his money in a bank, he will guarantee a net profit of $4,049.28.

However if he invested in stock, the current price for each share is $1.60 (number of shares = principal/price). After 3 years, the expected price is $1.90. He needs to pay $200 as fixed processing fees/costs during the investment.

The net Profit formula is = (Number of shares * 1.9) – Principal – fixed costs

Principal	**$10,000.00**
Share price(Now)	**$1.60**
Number of shares	*6250*
Share price(in 3 years)	**$2.10**
Fixed costs	**$200.00**
Net Profit	$2,925.00

Answer the following Questions:

Use Ms-Excel spreadsheet model for what-if-analysis. Define the names of the variable to setup the formulas by these variable names.

1- What should the share price be in order to do better than investing in a bank? (write your answer in cell K9)
2- Use Excel Data Table command to perform sensitivity analysis for Share price ranging from $1.5 to $2.10 step $0.05 and Net Profit as an output.
3- Draw a 2-D Column Chart for share price vs profit.

Q2 [25 Points]:

Eagle Airlines is deciding whether to purchase a five-passenger aircraft where some proportion of the hours flown would be charter flights and some hours would be regularly scheduled ticketed flights with an uncertain number of seats sold (capacity). The model is built on MS Excel sheet as follows:

Spreadsheet Model For Eagle Airlines

Input Variables	**Input Cells**
Charter Price/Hour	$325
Ticket Price/Hour	$100
Hours Flown	800

Capacity of Scheduled Flights	50%	
Proportion of Chartered Flights	0.5	
Operating Cost/Hour	$245	
Insurance	$20,000	
Intermediate Calculations		
Total Revenue	**$230,000**	**=(B8*B6*B4)+((1-B8)*B6*B5*B7*5)**
Total Cost	**$216,000**	**=(B6*B9)+B10**
Performance Measure		
Annual Profit	**$14,000**	**=B13-B14**

1-Use SensIt's one Inputs, One Output ,to solve for hours flown-start 400, stop 1000 and step 50?

2- Use SensIt's Many Inputs, One Output to see how your model's output depends on ranges you specify for each of the model's input variables. Use the following low, base, high values to do your analysis, Find the Tornado and Spider sensitivity output values and graphs, sort them by hours flown?

Input Variables	**Lower Bound**	**Base Value**	**Upper Bound**
Charter Price/Hour	$300	$325	$350
Hours Flown	500	800	1000
Insurance	$18,000	$20,000	$25,000

Q3 [25 Points]:

You are managing a factory that is **building three products**: TV sets, stereos and speakers. Each product is assembled from parts in inventory, and there are 3 types of parts: Chassis, SP cones, power supplies. Your goal is to produce the ***mix of products which will maximize profits***, given the inventory of products on hand.

Assume that you can sell TV sets for a gross profit of $75 each, stereos for a profit of $50 each, and speaker cones for $35 each.

To assemble a TV set, you need 1 chassis, 2 SP cones, 1 power supply. To make a stereo, you need 1 chassis, 2 SP cones, 1 power supply. And to build a speaker, all you need is 1 SP cone. The parts you have on hand are 450 chassis, 800 speaker cones, 450 powers. Your job is to build a model to solve for the problem.

Ensure to make cell format as integer number for all inputs/outputs.

Use the excel worksheet to define the variables and formulas. Use the Solver to define the target cell, changing cells, constraints to solve for required.

Good Luck

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