

BA3320 Fundamentals of Production

EXAM 1 Winter 2006 Dr. Banis

NAME:

Show calculations or you may not get credit

total 300 points

I Nineteenth Century Wolf Productions, Inc. has a pilot for a new TV show which could be a flop, a moderate success, or a great hit. There are three marketing alternatives for the show: Sell it outright to the late-night TV market, sell it to a network with limited royalties, or develop the show themselves. The payoffs for these three alternatives under the three possible outcomes are shown on the table.

	<u>Payoff</u> (\$K, NPV)			EMV
	Popularity			
	Flop	Success	Big hit	
Probability	0.4	0.5	0.1	
Sell Outright	300	300	300	
Keep Royalties	200	500	800	
Develop in-house	(300)	400	3,000	
calc EMVc				

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Calculate EMV for each alternative and show which alternative would be selected if following an EMV strategy.

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What is the most you would pay for perfect advance information on popularity of the show?

Show regrets for each case, and what the choice would be for a minimax regret strategy. What is the popular name used in class for the Minimax Regret strategy?

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	<u>regrets</u> (\$M, NPV)			common name for minimax regret
	Popularity			
	Flop	Success	Big hit	
Sell Outright				<div style="border: 1px solid black; padding: 5px; display: inline-block;">5 free points</div>
Keep Royalties				
Develop in-house				

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Suppose You could guarantee the show would be a hit by hiring a big name star (P(hit)=1.0, and you are certain). Which course would you follow on development and how much would this be worth to you compared to the situation with risk but no advance perfect information (i.e. what is the most you should pay the star) ?

Total = 60

- II 1) You are selling Printers that have normally distributed lifetimes (before needing major service) with a mean of 6 years and standard deviation of 3 years. How long should you make the warranty so that there will be less than 20% chance of breakdown within the warranty period? (show work and put answer in the box)

warranty length

2) For those printers, instead of a warranty, you are selling a six-year service contract. If the average cost of a repair that would be covered by this contract is \$100, how much should you charge for the whole six-year service contract to break even? Assume there is no other coverage for service, such as a warranty.

1. \$100
2. \$50
3. \$14.95
4. \$69
5. The printers won't break down until they are more than 9 years old

3) Sales of umbrellas and mascara are weather dependent. Umbrella profit is only \$10K in dry weather, but \$45K in rain. Mascara sells better in dry weather. Profit is \$20K in dry weather, \$5K in rain. At what probability of rain would you be indifferent between these two businesses?

1. $P_{rain} = 50\%$
2. $P_{rain} = 150\%$
3. $P_{rain} = 20\%$
4. $P_{rain} = 30\%$
5. 100% of each
6. $P_{rain} = 25/35$
7. $P_{rain} = 35/25$
8. $P_{rain} = 10/45$
9. $P_{rain} = 30/60$

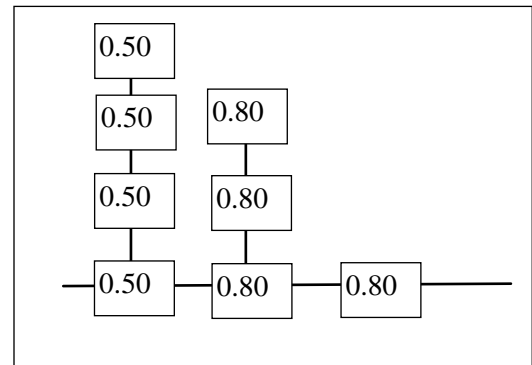
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each

4) You are filling 12 oz. beer bottles using a process with a standard deviation of 2 ounces. If you want your X-bar chart to have 3 sigma limits on either side of the mean and to have UCL, LCL at 10.5 and 13.5 oz. respectively, how large a sample should you use for each data point?

1. one
2. two
3. four
4. twelve
5. sixteen
6. one hundred

5) What is the reliability of this system?

1. 2.478
2. 3.84
3. virtually 1.0
4. 5.32
5. 1.12
6. 0.32
7. 0.0256
8. 0.744



Total = 75

A decision tree on whether to buy equipment that you might not need:

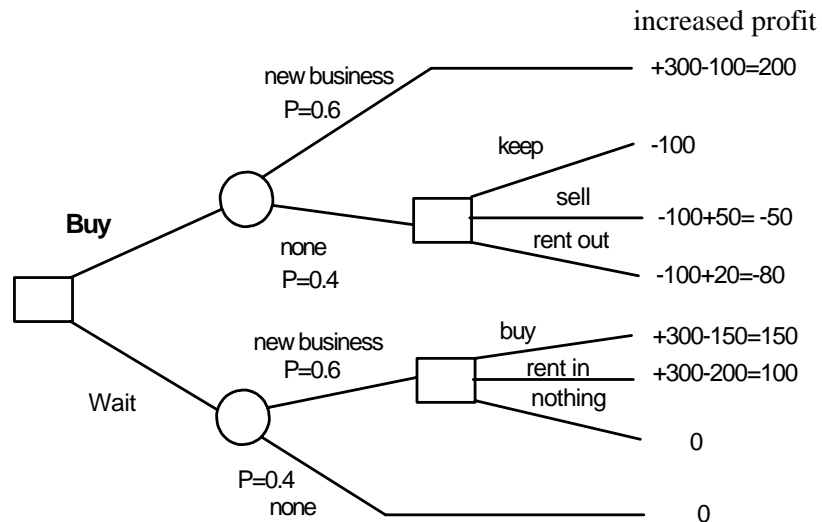
III

There is a 60% probability that there will be new business and would raise your revenue by \$300K but would require additional manufacturing equipment. There is a limited time offer to buy some manufacturing equipment that usually costs \$150K for \$100K. You won't know whether you need it until after the offer is over. If you waited until later to buy the equipment, you could either buy it at the regular price of \$150K, or rent it in for \$200K. If you didn't do anything, you wouldn't get the \$300K in potential revenue from the new business.

On the other hand, if you bought the equipment and didn't need it (the new business didn't materialize), you could rent it out for \$20K (so that your final expense is \$100K-20K= \$80K), or you could sell it for \$50K (only losing \$50K), or you could do nothing and suffer the whole loss of \$100K that you spent for this useless equipment.

A) Here is the decision tree on the decision to buy the equipment early at the bargain price or not. Calculate and indicate all profits at the nodes. To maximize EMV, which alternative would you choose?

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B) How much would it be worth to you (EVPI) to have prior knowledge of whether or not you will need the equipment?

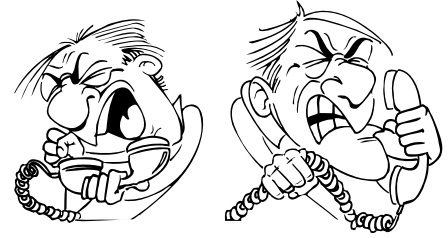
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C) The option of selling the equipment if you don't need it is an important factor in determining which alternative to pursue. If you couldn't rent it out, what is the break-even price for which you could sell the equipment to make you indifferent between the alternatives of buying it ahead of time or waiting?

Total = 60

IV

Bill Buyer is buying a business from Sally Seller. There are some problems (about \$10M worth) with the business, particularly with plant and equipment, which Sally Seller can either hide and lie about, cosmetically repair, or fix completely, working with Bill Buyer to fix it in a way that best meets Bill's needs. Bill Buyer doesn't know whether he should trust Sally to be completely open about things, and so may insist on an inspection that would cost each of them \$1M and catch some of the defects, forcing Sally to fix them. Bill might also insist on some really expensive third party guarantees (\$10M split between them, with Sally's part going up if there are undisclosed problems). All this results in the following COST table for the different combinations of strategies. Bill controls which row within each column. His costs are shown in the upper left. Sally controls which column in each row. Her costs are in the lower right PLEASE NOTE THESE ARE COSTS, and so each party wants to MINIMIZE the cost.



<i>Costs in \$M as a function of repair and guaranty strategies</i>				
Bill / Sally	Hide & Lie	cosmetic repair	Full disclosure	Sally's Minimum Cost
be open & trusting	10 / 1	15 / 5	0 / 10	
Insist on inspection	6 / 7	8.5 / 13.5	1 / 11	
Insist on third party guarantees	5 / 11	5 / 12	5 / 15	
Bill's Minimum cost				

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Use squares for Bill and circles for Sally to show which strategies would prevail if each party only chose to minimize short term cost without considering a cooperative approach. How much would each pay in the stable solution?

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Show, by drawing lines through those rows and columns, which strategies are dominated and wouldn't be pursued in any case.

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What would be the best (min total cost) solution for them both? What mechanism could be used to come to a stable agreement on that better solution?

Total = 60

V

- 1) There are two ways to produce exams and other course materials: **ignore the time value of money**
 1. Take them to Kinky's Copy shop and pay 7 cents per page plus a fixed cost of \$200 per year for gas driving around to use Kinky's copiers.
 2. Buy a copier and run them off in my basement, at a cost of 2 cents per page (including paper, toner, electricity, etc.). Assuming the copier would last about eight years and that the fixed cost of having the copier would be about \$1,000 per year.
- A) How many copies would I have to make per year to break-even on buying the copier?

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Breakeven copies/year

- B) Assuming I copy about 15,000 pages per year, how much could I spend per year on a copier and still break even?

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Breakeven copier price

- 1) The practice of working overtime while slacking off during regular working hours:
 1. the minimax regret strategy.
 2. the bologna sandwich technique.
 3. the salami technique.
 4. decision trees.
 5. factor rating.
 6. Ben Franklin's balance sheet approach.

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- 2) The "Trunk Monkey" was shown as a possible example of
 1. Customer-focused quality
 2. Product failure half-life
 3. Prisoner's Dilemma Model
 4. Calculated Breakeven
 5. Sensitivity Analysis
 6. The Salami Technique in negotiation
 7. Tit-for-tat strategy
 8. Situational Optimism
 9. The Golden Rule in TQM

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- 2) When should you get more information?
 1. When the information is relevant and could change the outcome.
 2. When you don't have anything better to do on nights and weekends.
 3. Whenever your boss hasn't told you what else to do before quitting time.
 4. When there's any more information to get.
 5. When the information is worth more than it costs.
 6. It depends on the Radar O'Reilly phenomenon.

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Total =45