

DECISION ANALYSIS

8. A local real estate investor in Orlando is considering three alternative investments: a motel, a restaurant, or a theater. Profits from the motel or restaurant will be affected by the availability of gasoline and the number of tourists; profits from the theater will be relatively stable under any conditions. The following payoff table shows the profit or loss that could result from each investment:

Investment	Gasoline Availability		
	Shortage	Stable Supply	Surplus
Motel	\$-8,000	\$15,000	\$20,000
Restaurant	2,000	8,000	6,000
Theater	6,000	6,000	5,000

Determine the best investment, using the following decision criteria.

- Maximax
 - Maximin
 - Minimax regret
 - Hurwicz ($\alpha = .4$)
 - Equal likelihood
9. A television network is attempting to decide during the summer which of the following three football games to televise on the Saturday following Thanksgiving Day: Alabama versus Auburn, Georgia versus Georgia Tech, or Army versus Navy. The estimated viewer ratings (millions of homes) for the games depend on the win-loss records of the six teams, as shown in the following payoff table:

Game	Number of Viewers (1,000,000s)		
	Both Teams Have Winning Records	One Team Has Winning Record; One Team Has Losing Record	Both Teams Have Losing Records
Alabama vs. Auburn	10.2	7.3	5.4
Georgia vs. Georgia Tech	9.6	8.1	4.8
Army vs. Navy	12.5	6.5	3.2

Determine the best game to televise, using the following decision criteria.

- Maximax
 - Maximin
 - Equal likelihood
10. Ann Tyler has come into an inheritance from her grandparents. She is attempting to decide among several investment alternatives. The return after 1 year is primarily dependent on the interest rate during the next year. The rate is currently 7%, and Ann anticipates that it will stay the same or go up or down by at most two points. The various investment alternatives plus their returns (\$10,000s), given the interest rate changes, are shown in the following table:

Investment	Interest Rate				
	5%	6%	7%	8%	9%
Money market fund	2	3.1	4	4.3	5
Stock growth fund	-3	-2	2.5	4	6
Bond fund	6	5	3	3	2
Government fund	4	3.6	3.2	3	2.8
Risk fund	-9	-4.5	1.2	8.3	14.7
Savings bonds	3	3	3.2	3.4	3.5

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Determine the best investment, using the following decision criteria.

- a. Maximax
- b. Maximin
- c. Equal likelihood

11. The Tech football coaching staff has six basic offensive plays it runs every game. Tech has an upcoming game against State on Saturday, and the Tech coaches know that State employs five different defenses. The coaches have estimated the number of yards Tech will gain with each play against each defense, as shown in the following payoff table:

Play	Defense				
	54	63	Wide Tackle	Nickel	Blitz
Off tackle	3	-2	9	7	-1
Option	-1	8	-2	9	12
Toss sweep	6	16	-5	3	14
Draw	-2	4	3	10	-3
Pass	8	20	12	-7	-8
Screen	-5	-2	8	3	16

- a. If the coaches employ an offensive game plan, they will use the maximax criterion. What will be their best play?
- b. If the coaches employ a defensive plan, they will use the maximin criterion. What will be their best play?
- c. What will be their best offensive play if State is equally likely to use any of its five defenses?

12. Microcomp is a U.S.-based manufacturer of personal computers. It is planning to build a new manufacturing and distribution facility in either South Korea, China, Taiwan, the Philippines, or Mexico. It will take approximately 5 years to build the necessary infrastructure (roads, etc.), construct the new facility, and put it into operation. The eventual cost of the facility will differ between countries and will even vary within countries depending on the financial, labor, and political climate, including monetary exchange rates. The company has estimated the facility cost (in \$1,000,000s) in each country under three different future economic and political climates, as follows:

Country	Economic/Political Climate		
	Decline	Same	Improve
South Korea	21.7	19.1	15.2
China	19.0	18.5	17.6
Taiwan	19.2	17.1	14.9
Philippines	22.5	16.8	13.8
Mexico	25.0	21.2	12.5

Determine the best decision, using the following decision criteria.

- a. Minimin
- b. Minimax