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To obtain a soln of rectangular game, it is feasible to find out:

1) The best stratergy for player A
2) player B
3) The value of the game

Ex: Player A can choose his stratergy from (A_1, A_2, A_3) only while B can choose from the set (B_1, B_2). The rules of the game state that, the payments should be made in accordance with the soln of the stratergies.

Stratergy Pair selected	Payment to be made
(A_1, B_1)	Player A pays ₹1 to player B.
(A_1, B_2)	Player B pays ₹6 to player A.
(A_2, B_1)	Player B pays ₹2 to player A.
(A_2, B_2)	Player B pays ₹4 to player A.
(A_3, B_1)	Player A pays ₹2 to player B.
(A_3, B_2)	Player A pays ₹6 to player B.

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Q1. What strategies A and B play inorder to get the optimum benefit of the play?

		B_1	B_2	Player B.
Player A	A_1	-1	6	-1 (circle min)
	A_2	2	4	2 $\bar{v}$ → Max of min. (Maxmin)
	A_3	-2	-6	-6
		↓	↓	
		2	6	

minmax

Payoff matrix for player A

Value of the game is ₹2. for A & -₹2 for Player B

Optimum soln is:

1.) Optimum strategy for player A - 2.
2.) player B - B_1

The value of the game is ₹2.

As $v \neq 0$ the game is not a fair game.
As $\bar{v} = \underline{v} = 2$, it is a strictly determinable game.

Q2. The payoff matrix of the game is given. Find the soln.

A \ B	I	II	III	IV	V	
I	-2	0	0	5	3	-2
II	3	2	1	2	2	1 → max
III	-4	-3	0	-2	6	-4 max min - 1
IV	5	3	-1	2	-6	-6
	5	3	1	5	6	

minmax - 1.

Op: soln
A - II
B - III

Value of the game is ₹1 for A & -₹1 for player B.

B.

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Q3.

	I	II	III	
I	-2	15	-2	-2
II	-5	-6	-4	-6
III	-5	20	-8	-8
	-2	20	-2	

There are several methods for determining for optemal strategies & the value of the game. Like arithmetic or analytical method, graphi -cal method or simplex method.

1.) ARITHEMETIC METHOD.

A 2x2 matrix where there is no saddle pt can be solved by AM as follows:

Consider the foll.

$$\begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}$$

Value of the game is

$$V = \frac{a_{11}a_{22} - a_{21}a_{12}}{(a_{11}+a_{22}) - (a_{12}+a_{21})}$$

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With the coordenates,

$$x_1 = \frac{a_{22} - a_{21}}{(a_{11} + a_{22}) - (a_{12} + a_{21})}$$

$$x_2 = \frac{a_{11} - a_{12}}{(a_{11} + a_{22}) - (a_{12} + a_{21})}$$

$$y_1 = \frac{a_{22} - a_{12}}{(a_{11} + a_{22}) - (a_{12} + a_{21})}$$

$$y_2 = \frac{a_{11} - a_{21}}{(a_{11} + a_{22}) - (a_{12} + a_{21})}$$

Optemal stratergy for player A is S_A
$= (x_1, x_2)$

" for player B is S_B
$= (y_1, y_2)$.

The vector $(x_1, x_2), \ldots x_m$ of non-negative no's satisfying $x_1 + x_2 = 1$ is called mixed stratergy of player A.

The vector $y = (y_1, y_2)$ of non-negative no's satisfying $y_1 + y_2 = 1$ is called mix-ed stratergy of player B.

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Q. Solve the foll. payoff matrix for player A.

$$\begin{bmatrix} 5 & 1 \\ 3 & 4 \end{bmatrix} \quad \begin{matrix} 1 \\ 3. \end{matrix}$$

$$5 \quad 4$$

This problem does not have SP, ∴ AM is used to solve the problem.

Value of the game is,

$$V = \frac{(5 \times 4) - (3 \times 1)}{(5+4) - (3+1)}$$

$$\Rightarrow \frac{20-3}{9-4} \Rightarrow \frac{17}{5}.$$

$$x_1 = \frac{1}{5} \quad x_2 = \frac{4}{5} \quad y_1 = \frac{3}{5} \quad y_2 = \frac{2}{5}.$$

$$S_A = \left(\frac{1}{5}, \frac{4}{5}\right) \quad S_B = \left(\frac{3}{5}, \frac{2}{5}\right).$$

The Arithmetic method consists of the foll. steps:

1.) Find the difference of 2 nos in col 1 & enter the resultant in col 2. Neglect the -ve sign if it occurs.

2.) Find the difference b/w 2 no's in col 2 & enter the resultant in col 1. Neglect the -ve sign if it occurs.

3.) Repeat the same procedure for 2 rows.

~~Solve the~~.

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Q. ~~solve the foll:-~~

Growing complexities of modern projects required to optimise the efficiency of executing the project.

This Project management has ~~evovl~~ evolved as a new field as a development tcoo-techniques for planning, scheduling & controlling for proj.

1.) CPM - Critical path management.
2.) Project evaluation & review technique (PERT)

* APPLICATIONS OF PERT-CPM.

1.) They are applied to a variety of problems that include :
(i.) construction of dam or kenal system.
(ii.) construction of a building or a highway.
(iii.) Maintainenance of flights or oil refineries.
(iv.) space flights
(v.) cost control of a project.
(vi.) Designing a prototype of m/c.
(vii.) Development of supersonic ~~m/c~~ plane.
(viii.) Designing & developing s/w projects.

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* BASIC STEPS IN PERT-CPM TECHNIQUES.

1) Project Scheduling by PERT-CPM consists of 4 main steps :

(a.) PLANNING

(i.) It starts ~~with~~ by splitting total project into smaller sub-projects.

(ii.) These sub-projects are furtha divided into activities.

(iii.) The relationship b/w activities is establi-shed &

(iv.) Responsibilities & authorities are also taken.

Planning reduces the possibility of overlooking any important task.

(b.) SCHEDULING

(i.) It involves preparing a timing chart showing the start & finish time for each activity as well as its relationship to other activ-ties of the project.

(ii.) It finds the critical path activity which requires a special attention if the project has to be completed on time.

(iii.) For non-critical activity, the schedule must show the amount of slack or float type

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which can be used when such activities are delay -ed or when limited resources are available.

(c) ALLOCATION OF RESOURCES.

(i) A resource is a variable such as labour, finance, equipment & space which will impose a limitation on completion time of the project.

(ii) When resources are limited & conflicting a systematic method allocation for resources become very essential.

(d) CONTROLLING.

(i) By while having progress report from time to time & updating the n/w continously, a better control over the project is excersied.

(ii) Arrow diag & time charts are used for making periodic progress reports.