WALD Pessimistic Criteria:- According to the pessimism criterion, the decision Maker, in the case of the revenue decision Matrix, tends to choose the best, lowest "Maximize the minimum". This is done by choosing the lowest value of revenues and profits in each alternative and then choosing the highest of those values "MaxiMin"

According to the pessimism criteion, in the case of a decision matrix of costs, the decision maker tends to choose the lowest of the best "Minimize the maximum". This is done by choosing the highest values of revenues and profits in each alternative and then choosing the lowest values "Mini Max

Laplace Bayes Criteria: According to Laplace criterion, the decision Maker depends on the method of calculating the average returns or costs present in the cell of the decision Matrix for each alternative separately according to the following equation:-

(9)

$$V(a_j) = \text{mean}(a_j) = \frac{1}{n} \sum R_{a_i, b_j}$$

where
$V(a_j)$: Arthimatic mean for all values of alternative in the decision matrix
a_i : alternative
b_j : state of natural
$R(a_i, b_j)$: Return all alternative a_i and for all state of natural in the decision Matrix

In the case of the revenue matrix, the decision maker takes the Max (mean).
In the case of the Cost matrix, the decision maker takes the Min (Mean)

Advantages and disadvantages of Laplace criterion

1-What distinguishes Laplace criterion in evaluating decisions is that it is easy to apply and calculate, and it suits the personality and behavior of the decision maker, which tends to be completely neutral towards risks

2- What is flawed with Laplace's criterion is that it is far from reality in most cases, considering its reliance on the principle of equal probabilities for each state of nature to be achieved as it is difficult or difficulty estimating the probability of a particular state of nature, and thus the decision maker will tend to equate its unknown probability with the probabilities of the rest of the states of nature.

3- Laplace's criterion is considered one of the criteria that legitimize linear aggregation, as it is unreasonable, for example to equate the probability of achieving economic prosperity with economic depression.

4- Hurwitz Coefficient Criteria: The realism criterion is considered intemediate between the optimism and pessimism criteria by choosing the highest realistic values formed from the sum of multiplying the matrix values by each of the pessimism factor (α) and the pessimism factor ($1-\alpha$)

The best alternative is chosen according to the quality of the decision matrix (Returning / cost) below is the detail

In case of Returning matrix (Revenues)

$$Max[\alpha(Max R_{i,j}) + (1-\alpha)(Min R_{i,j})]$$

In case of Cost Matrix

$$Min[\alpha(Min R_{i,j}) + (1-\alpha)(Max R_{i,j})]$$

Note $0 < \alpha < 1$

Advantages and disadvantages of the realism criterion in decision making

1- The method of realism is characterized by balance and fairness in judging a decision as it combines the conditions of optimism and pessimism

2- The decision maker's criterion of realism is of great importance to the decision maker who is optimistic at a certain level and pessimistic at the rest of the level Neither is very optimistic ($\alpha = 1$) Nor is he too pessimistic ($\alpha = 0$)

5_ Regret Criteria: The regret criterion is applied in decision making depending on the nature of the decision matrix (Returning / cost) approved in extracting the regret matrix

1_ In the case of a decision matrix for returns "Regret Matrix"
Under the regret criterion, a regret matrix is prepared, which is extracted by choosing the largest value in each column that represents the state of nature bj
Then we subtract the same maximum value as an absolute value from the rest of the values of the same column, and then we choose the lowest highest value in each line representing the alternative from the regret matrix (Min Max)

2_ Under the remorse criterion, a remorse matrix is prepared. "Regret Matriv
It is extracted by choosing the smallest value in each column that represents the state of nature (Min bj)
Then we subtract the same minimum values as an absolute value from the rest of the values of the same column, and

then we choose the largest value in each line representing the alternative. Then we choose the lowest of the highest value of the regret matrix.

Example: A decision-making problem was presented to the decision maker which is essentially the decline in the organization's production capacity
The company's management has written the following strategies:-
Acquiring modern machines, creating a new production line, Establishing a new factory, Increasing daily working hours
Information is available about the following states of nature
Economic boom, Natural economy
Economic depression
Required: what is the best alternative using the criteria

1- Optmist criteria
2- pessimist (Wald)
3- Laplace (equal likelihood)
4- Hurwicz criteria $\alpha = 0.7$
5- Regret matrix (savag