Modern times have increased criteria and developments, and many corporate firms are finding it difficult to make judgments with the best outcomes. With the help of prescriptive analytics, we are able to employ cutting-edge techniques like mathematical programming to assess the impact of various choices on the outcome or even to identify the choices that might lead to the best possible outcome for a given situation, one such mathematical programming technique which is used and found to be helpful is linear programming.[[1]](https://kent.instructure.com/courses/53629/assignments/700079/submissions/111560?preview=1&rand=795639" \l "_ftn1)

In other words, linear programming is a way to get the best result (like the maximum profit or the lowest cost) in a mathematical model whose requirements are represented by linear relationships. It is a straightforward technique where we represent complex relationships through linear functions and then find the optimum points. It is applicable to many academic disciplines. It is extensively utilized in mathematics and, to a lesser extent, in problems involving commerce, economics, and various types of engineering. Manufacturing, transportation, energy, and telecommunications are among the sectors that use linear programming models. It has demonstrated modeling success for a variety of planning, routing, scheduling, assignment, and design issues.[[2]](https://kent.instructure.com/courses/53629/assignments/700079/submissions/111560?preview=1&rand=795639" \l "_ftn2)

**Reasons for Using Linear Programming in Real world Problems:**

* LP makes logical thinking and provides better insight into business problems.
* Manager can select the best solution with the help of LP by evaluating the cost and profit of various alternatives.
* LP provides an information base for optimum allocation of scarce resources.
* LP assists in making adjustments according to changing conditions.
* LP helps in solving multi-dimensional problems.

**Disadvantages with the use of linear programming:**

* Linear programming assumes linear relationships among decision variables. However, in real-life problems, decision variables, neither in the objective function nor in the constraints is linearly related.
* While solving an LP model there is no guarantee that decision variables will get an integer value. For example, how many men/machines would be required to perform a particular job, a non-integer valued solution will be meaningless. Rounding off the solution to the nearest integer will not yield an optimal solution.
* The linear programming model does not take into consideration the effect of time and uncertainty.
* Parameters in the model are assumed to be constant but in real-life situations, they are frequently neither known nor constant.[[3]](https://kent.instructure.com/courses/53629/assignments/700079/submissions/111560?preview=1&rand=795639" \l "_ftn3)
* Linear programming deals with only a single objective, whereas in real-life situations a decision problem may have conflicting and multiple objectives.

**Why LP model is still used even though results are not same as real world:**

The solutions and outcomes from those mathematical equations will always be an optimal solution bounded to our assumptions, as the linear programming model is built on assumptions with respect to real-world situations. Despite this, it has applications and the ability to provide multi-dimensional parameter solutions. Although it does not take effect of time into consideration, corporate companies now a days aiming for optimal solution with maximum profit with minimum expenditure which this model aims to achieve.

In my opinion, this model provides a solution to a business problem without considering the real life natural factors as mentioned above, I believe that companies tend use this solution as a base reference and evolve from there on. This ultimately helps the companies to reduce the time taken to provide a solution to the problem. Despite its limitations like time and multi conflict constraints, it provides some helpful solution which can help to reduce costs and expenditure. Hence LP model is still used to solve in real problems though the results are not same.

[[1]](https://kent.instructure.com/courses/53629/assignments/700079/submissions/111560?preview=1&rand=795639" \l "_ftnref1) [https://www.investopedia.com/terms/p/prescriptive-analytics.aspLinks to an external site.](https://www.investopedia.com/terms/p/prescriptive-analytics.asp)

[[2]](https://kent.instructure.com/courses/53629/assignments/700079/submissions/111560?preview=1&rand=795639" \l "_ftnref2) [https://en.wikipedia.org/wiki/Linear\_programmingLinks to an external site.](https://en.wikipedia.org/wiki/Linear_programming)

[[3]](https://kent.instructure.com/courses/53629/assignments/700079/submissions/111560?preview=1&rand=795639" \l "_ftnref3) Operations Research Theory and Applications – JK Sharma ([https://www.amirajcollege.in/wp-content/uploads/2020/10/3151910-operations-research-theory-and-applications-by-j.-k.-sharma-z-lib.org\_.pdf Links to an external site.](https://www.amirajcollege.in/wp-content/uploads/2020/10/3151910-operations-research-theory-and-applications-by-j.-k.-sharma-z-lib.org_.pdf))