

Solution:

Imagine you're on a soccer field, and you want to score a goal.

If you do this by finding the optimal position to kick the ball into the net by considering many factors, including slope of the field, past performance of the goalkeepers and defenders, then it is Gradient-based optimization.

Instead, if the player explores various paths on the field randomly, sometimes moving toward the goal and sometimes away from it, until they discover the best route to score, it is called gradient-free optimization.

Both approaches aim to help you score the goal, but one relies on strategic guidance, while the other relies on a trial-and-error exploration of possibilities on the field. There is no one correct optimization that will work perfectly for every situation, hence it is important to evaluate every method with diligence.