**Knapsack Problem**

**Definition:**

The Knapsack Problem belongs to Combinatorial Optimization Problems. In such problems, we try to “maximize” (or “minimize”) some “quantity”, while satisfying some constraints. For example, the Knapsack problem is to maximize the obtained profit without exceeding the knapsack capacity.

**Types:**

There are two versions of the problem.

1) 0-1 knapsack problem.

2) Fractional knapsack problem.

**Solution of Knapsack Problem:**

**Greedy Algorithm:**

Greedy algorithms build a solution part by part. This approach is mainly used to solve optimization problems.

Greedy method is easy to implement and quite efficient in most of the cases. There are three criteria to solve the 0/1 knapsack problem:

• Select object with maximum Profit.

• Select object with minimum Weight.

• Select object with maximum Density (Profile/Weight)

**3**

**Dynamic Algorithm:**

Is a method for solving optimization problems.

**The idea:** Compute the solutions to the sub-problems **once** and store the solutions in a table, so that they can be **reused** (repeatedly) later.

**Project:**

A transportation company has to transport items. If item has some weight and each truck can carry items with total some limited weight, this project will give the ideal amount for the trucks to carry as much weight as possible.