Date	16 November 2022
Team ID	PNT2022TMID17341
Project	Estimate the crop yield using data analytics

Utilization of algorithm ,dynamic programming,optimization

dynamic programming is an optimization approach that transforms a complex problem into a sequence of simpler problems; its essential characteristic is the multistage nature of the optimization procedure. More so than the optimization techniques described previously, dynamic programming provides a general frameworkfor analyzing many problem types. Within this framework a variety of optimization techniques can be employed to solve particular aspects of a more general formulation. Usually creativity is required before we can recognize that a particular problem can be cast effectively as a dynamic program; and often subtle insights are necessary to res**igure 11.1** Street map with intersection delays.
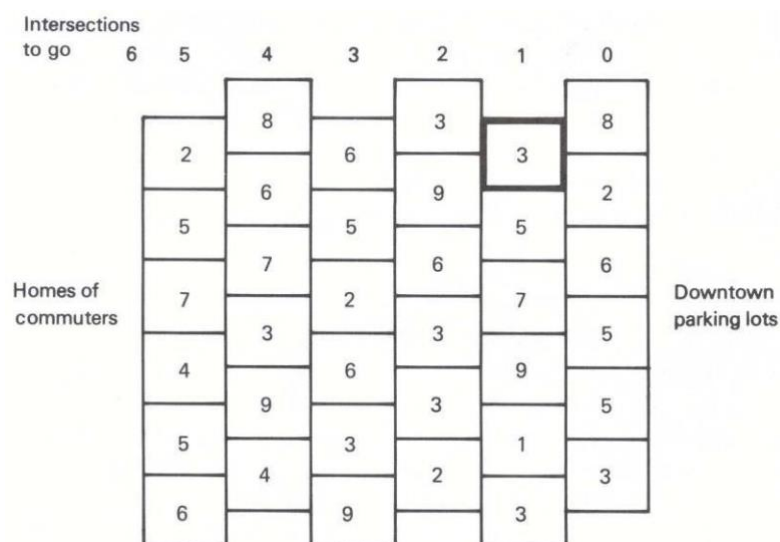

Figure 11.2 Compact representation of the network.

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Algorithm 2: AR-TO-BE CONVERSION ALGORITHM

if scheduling lease type== Immediate lease then:
      if resources required are available at the time then:
            allocate resources to Immediate lease
      else
            reject Immediate lease and print message
else
      if scheduling lease type== BE then:
            Queue BE lease and set state of lease to queue.
      else
       if scheduling lease type==AR then:
                  if no AR lease is running on required time slot & resources are
                  free then:
                        allocate resources to AR
                  else
                              if AR not getting resources & going to be rejected by the
                              scheduler then:
                                    Provide dynamic choice for AR lease convertible to
                                    BE lease
                                    if accepted then:
                                          convert this AR to BE, queue BE lease and set
                                          state of lease to queue
                                    else
                                          reject AR.
            else
                        if scheduling lease type== DLS then:
                              slack=(deadline-start time) / duration
                              if slack < 1.1 then
                               reject lease and print message to extend dead line or
                               submit lease as AR lease
                              else
                               find a single time slot which can satisfy complete lease
                               within deadline
                               if new lease is not schedulable as above then:
                                    find multiple slots which together can satisfy this
                                    conditions
                               if new lease is not schedulable by any of the above
                               methods then:
                                 find leases to be rescheduled & reschedule deadline
                                 leases
                               else
                                 reject new lease & print message
                        else
                              print message invalid lease type
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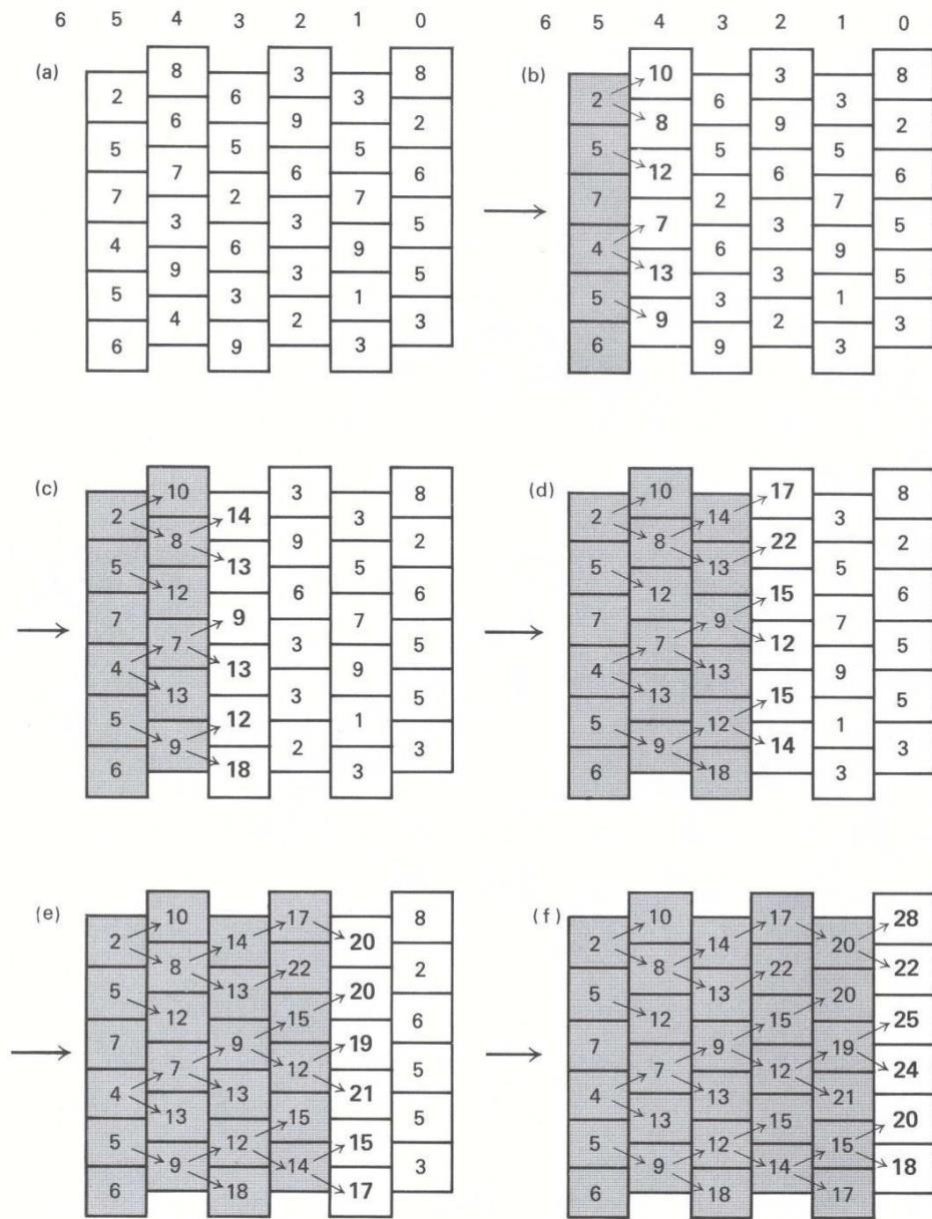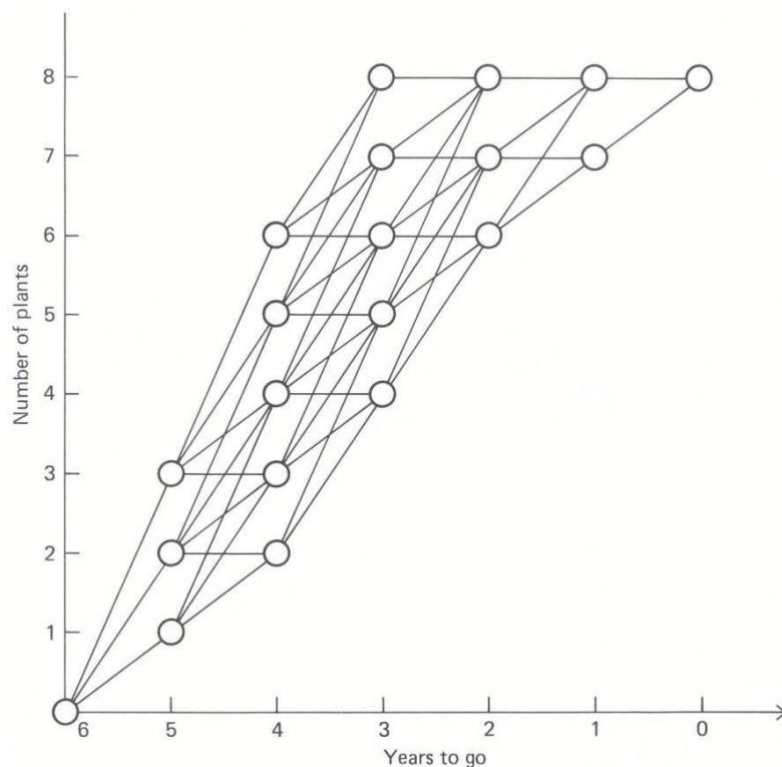
Figure 11.6 Solution by forward induction.

Figure 11.8 Allowable capacity (states) for each tage

plus the plant costs, which depend upon the year of construction and whether 1, 2, or 3 plants are completed. Measured in thousands of dollars, these costs are

$$1500 + c_n x_{n,}$$

the one additional plant is the $1500 common cost plus the $5200 cost per plant, for a total of $6700. (All costs are measured in thousands of

dollars.) The column headed $d_1 * (s_1)$ gives the optimal decision function, which specifies the optimal number of plants to construct, given the current state of the system.

Now let us consider what action we should take with two years (stages) to go. Tableau 2 indicates the possible costs of each state:

Tableau 1Tablea

s_2 \ d_2	0	1	2	$v_2(s_2)$	$d_2^*(s_2)$
8	0	—	—	0	0
7	6,700	7,000	—	6,700	0
6	—	13,700	12,500	12,500	2

$$\underbrace{c_2(s_2, d_2) + v_1(s_1)}$$

$$\underbrace{c_1(s_1, d_1)}$$