Assignment Problem

The Hungarian Method

i)   Get at least one zero in each row and each column of effectiveness matrix by subtracting the smallest element from each element of every row (column).

ii)   Try to complete assignment using zero elements only:

Examine rows successively beginning with row 1, until a row with exactly one unmarked zero is found—mark it with Δ. Cross out (×) other zeros in the same column. Repeat until each row has no marked zeros or at least two zeros.

Now examine columns successively for single unmarked zeros and mark them Δ. Cross (×) other zeros in the same row.   Repeat until each column has no marked zeros or at least two zeros.

Draw the minimum number of vertical and horizontal lines that are needed to cover each zero element at lease once:

a) Check (✓) all rows for which assignments have not been made

b) Check (✓) columns not already checked which have zeros in checked rows

c) Check (✓) rows not already checked which have assignments in checked columns

d) Repeat b) and c) until no further checks can be made

e) Draw lines through all unchecked rows and checked columns. There should be n such lines.

f) Examine elements that do not have at least one line through them. Let k be the smallest element. Subtract k from every element in each row containing uncovered elements

g) Some elements would have negative signs. Eliminate negative signs by adding k to those columns

iii)   Go to step (ii)