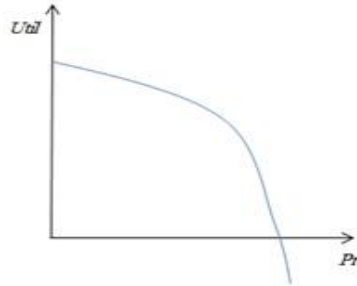
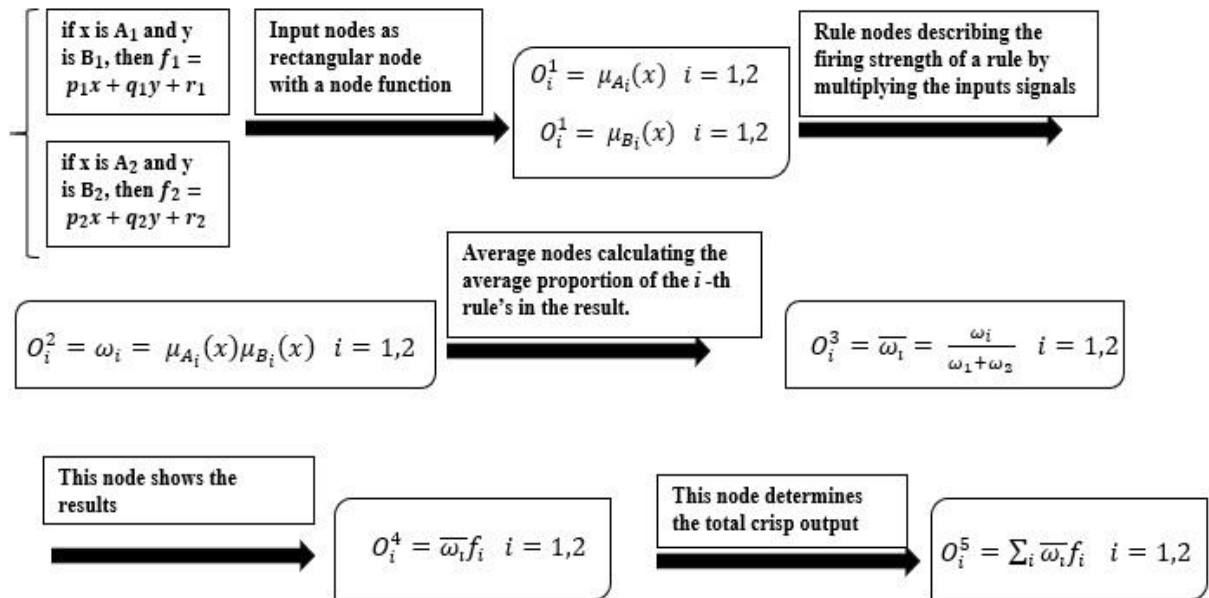


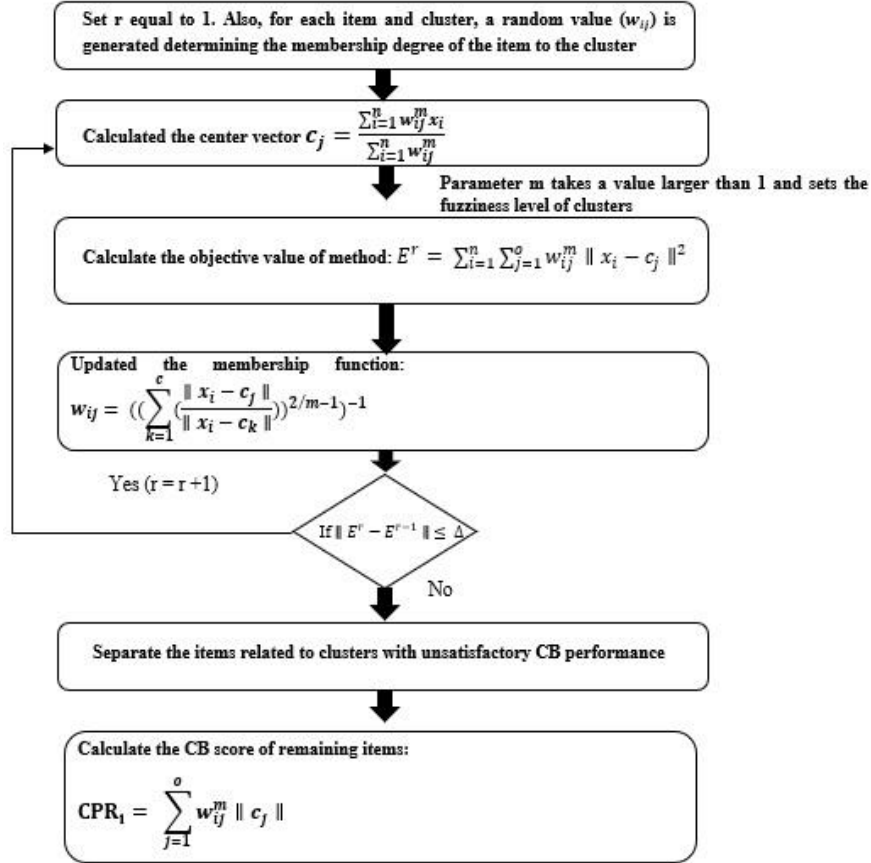
Supplementary material for Aghamohammadi-Bosjin, Rabbani and Tavakkoli-Moghaddam, “Agile two-stage lot-sizing and scheduling problem with reliability, customer satisfaction and behaviour under uncertainty: a hybrid metaheuristic algorithm”, *Engineering Optimization*, 2019.



Section 1. Graphic representation of utility for a given price.



Section 2. Framework of the ANFIS with two rules.



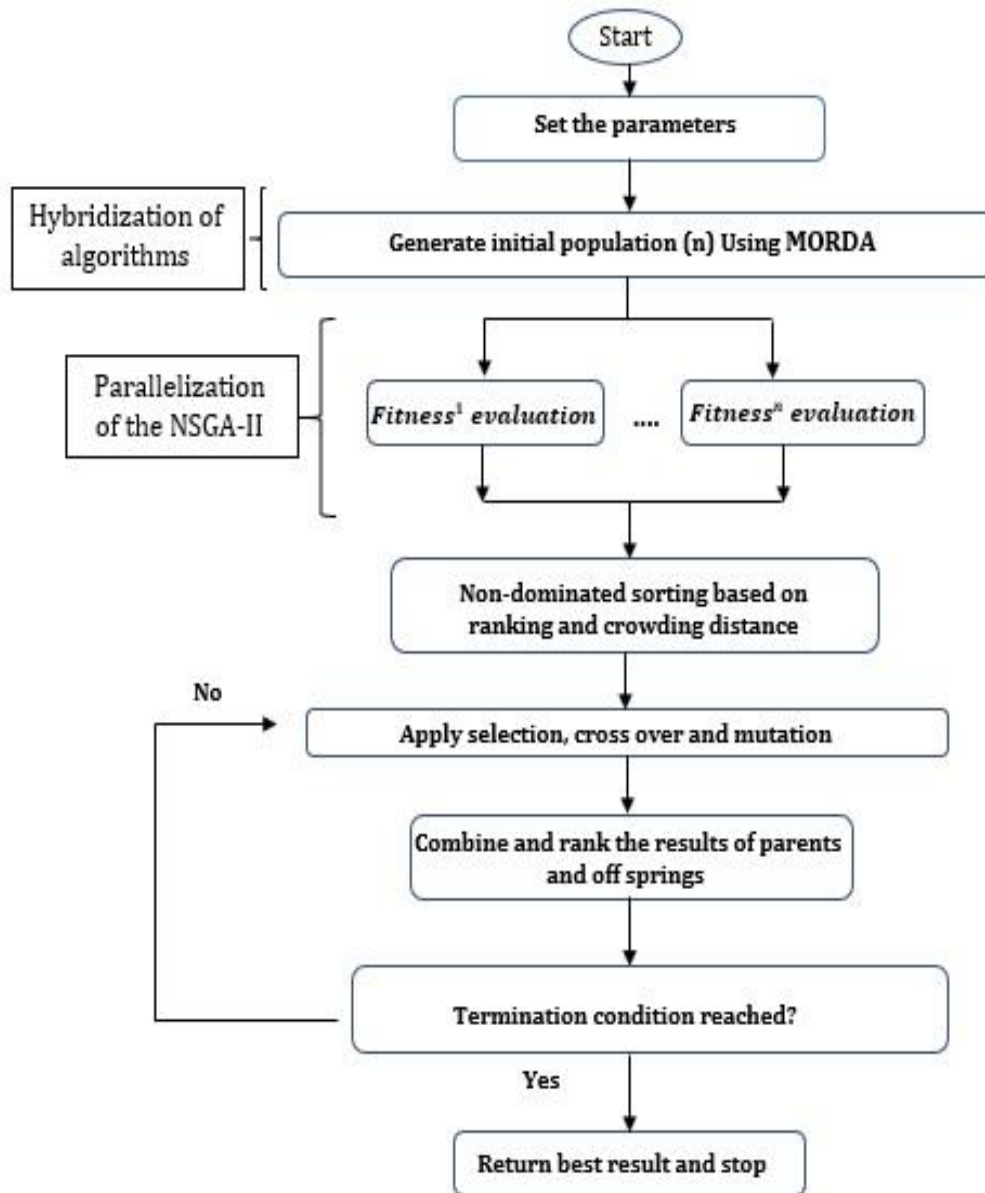
Section 3. Framework of the fuzzy c-means clustering method.

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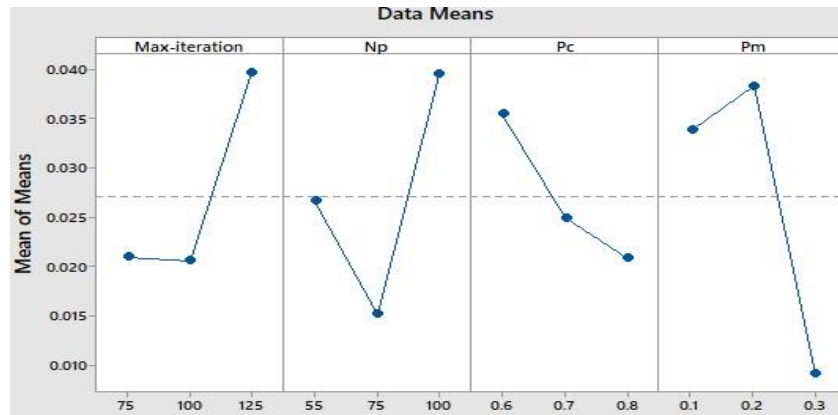
Generate the initial population (RD).
Compute the objective function (OFV) value and sort the results.
Divide the solutions into hinds and male RDs.
Create the pareto frontiers.
Choose the best pareto frontier based on the crowding distance metric.
X*= the best solution.
While (Run time < Maximum simulation time)
  For each male RD.
    Conduct local search and update the results.
  End for
  Sort the males
  For each male commander
    Conduct fighting operator between male commander and stag and update the
    position of male
  End for
  For each male commander
    Conduct mating operator between male commander and the selected hinds of his
    harem randomly.
  End for
  For each stag
    Select the nearest hind and mate the stag with the selected hind.
  End for
  Apply roulette wheel selection to generate new population.
  Update the results.
End while

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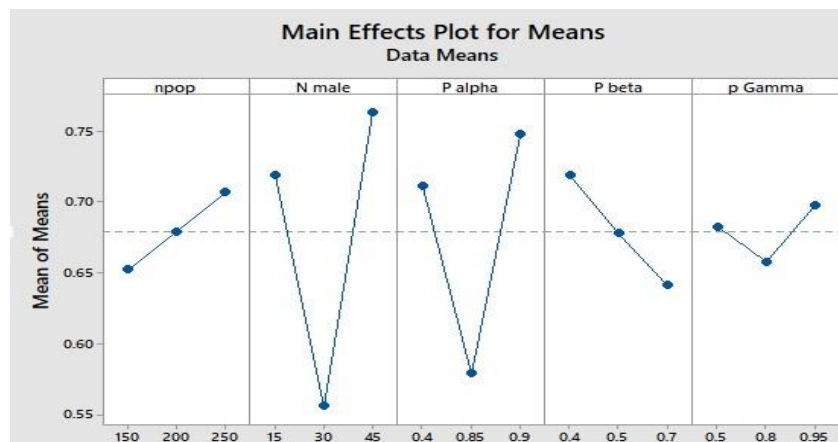
Section 4. Summary of MORDA.



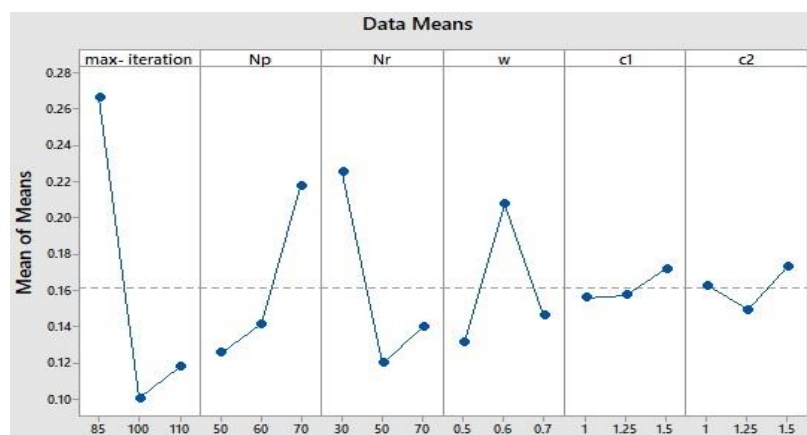
Section 5. The flowchart of the proposed HRDPGA.



Section 6.a Diagrams of the PNSGA-II parameters tuning based on the Taguchi method.



Section 6.b Diagrams of the MORDA parameters tuning based on the Taguchi method.



Section 7. Diagrams of the MOPSO parameters tuning based on the Taguchi method.