

Paradox Software Consulting Inc.



SUPPLY ASSIGNER 1.0

PRODUCT DESCRIPTION

AUGUST, 2003

GENERAL PRODUCT DESCRIPTION

Supply Assigner is a supply assignment and demand fulfillment tool. It can be used as a stand-alone Windows application for planning or as a Windows DLL that can be integrated into any Windows or web-based Supply Chain Planning application for execution. It can take a set of supply values, a set of demand values, and a matrix of costs of assigning a unit supply of a supply location to a demand location. It then optimizes/minimizes the total cost of assigning the optimal supply quantities to all demand locations to meet the demand requirements not violating the supply constraint.

Supply Assigner needs the Supply and Demand information for the different sourcing and fulfillment locations. Additionally, a cost matrix needs to be setup to define the per unit cost of fulfilling demand at each fulfillment location from each sourcing or supply location. If a cost matrix cannot be defined by the user, Supply Assigner can setup one by calculating the distances between each sourcing and fulfillment location pair and use them as the costs. Supply Assigner consists of data management and assignment engine modules. Solutions can be exported as text files into MS Word or MS Excel. Data input is in the form of flat files. Supply Assigner uses powerful linear programming algorithms to generate optimal sourcing of demand at each fulfillment location.

Each sourcing and fulfillment location is defined in Supply Assigner as a Node. Each Node maintains the information of its type and the quantity it is supplying or receiving. In addition, each Node also maintains information on its sourcing/fulfillment nodes and quantities it received/supplied from/to those nodes. When trying to match the supply to demand, Supply Assigner runs several solver iterations until there is no further reduction in the total assignment cost.

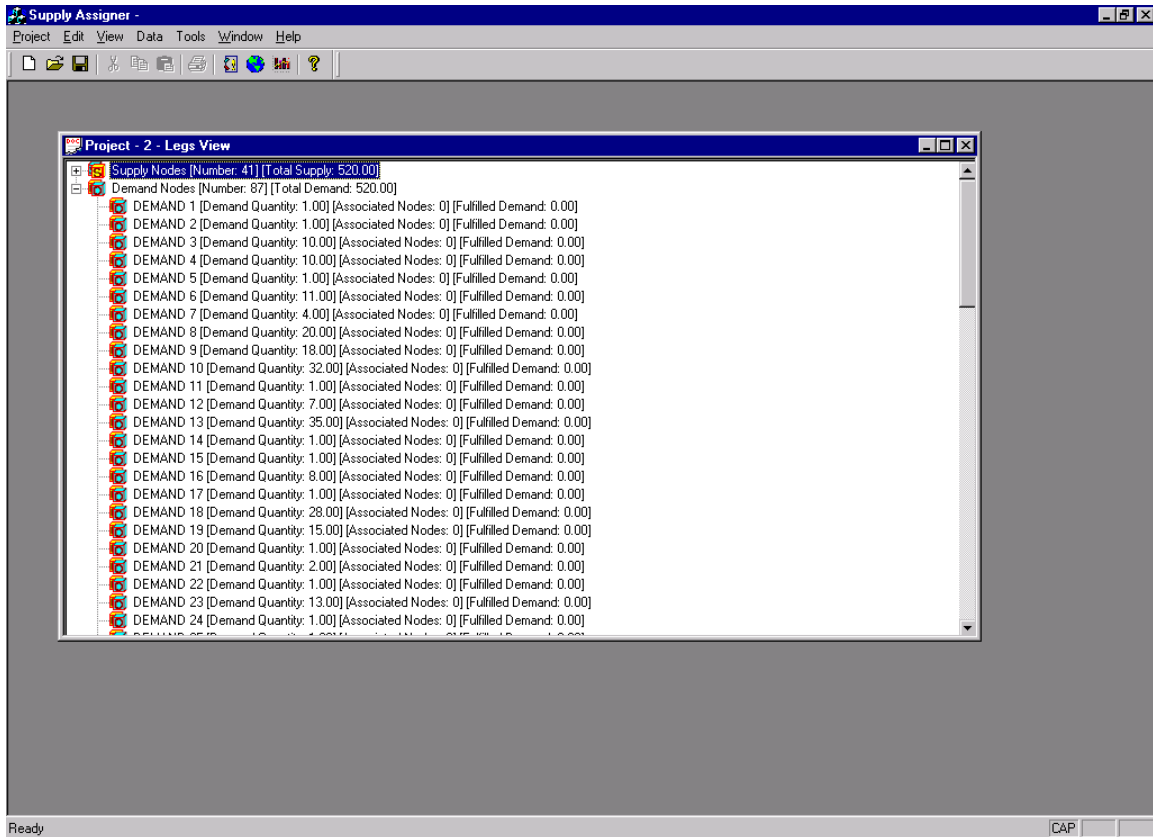
DATA MANAGEMENT

Supply and demand location data can be imported into Supply Assigner in the form of ASCII files (tab or comma delimited). The data import wizard guides users through the setup process for importing this data into the system. Very minimal data entry is required during the setup. All the user settings are stored in the system so that repeated imports of data of same format will require absolutely no data entry, minimizing user errors.

Supply Assigner's data views present Supply and Demand Nodes, Cost Matrix data, and Assignment Matrix data. These views enable users to quickly lookup data, make changes, and recalculate the solution or run the assignment engine with a different set of parameters.

As the solution is developed, the data views update automatically to reflect the changes.

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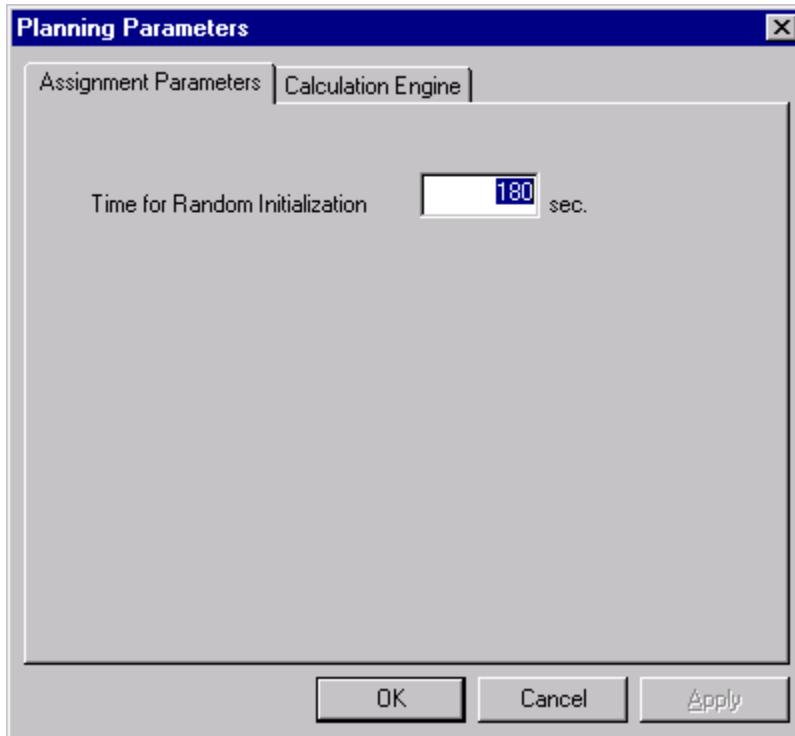
ASSIGNING SUPPLY

Supply Assigner uses robust assignment algorithms to optimally assign supply to demand to reduce the total assignment cost. The algorithms are controlled by the user-defined parameters.

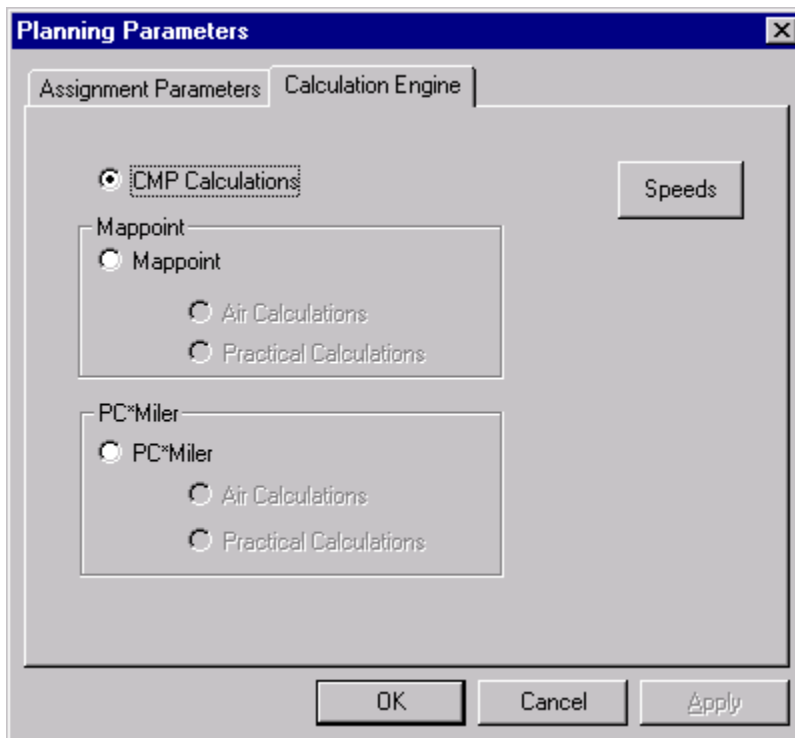
Parameters

The assignment algorithm is currently controlled by a few parameters: 1) Time For Random Initialization, 2) Type of Calculation Engine. The time parameter controls the time spent by the engine in using trial and error procedure while iterating to improve the initial solution. Not all problems need this procedure but on occasions this procedure needs to be used to help improve an initial solution. Any number of user-defined parameters can be added to constrain the solution procedure with minimal development effort.

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Calculation Engine



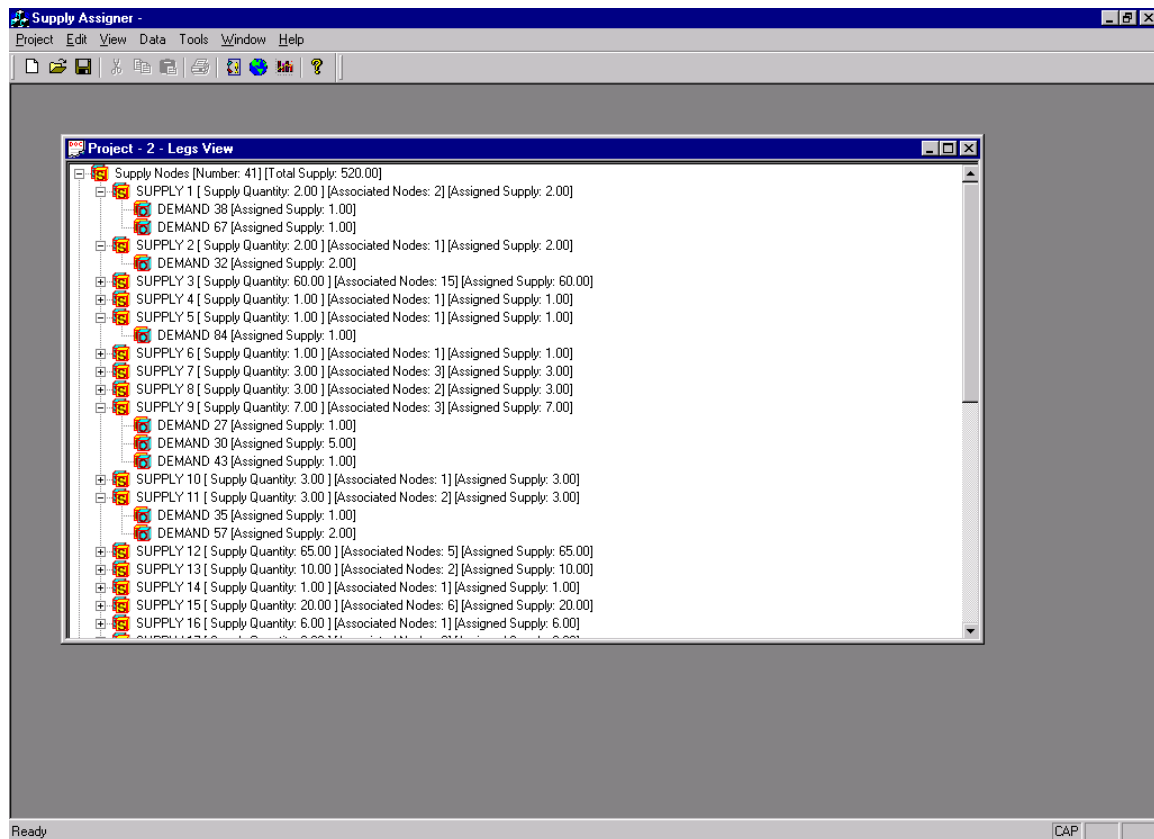
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The distance and time calculations, if required, by the assignment and/or cost calculation algorithms are obtained from different sources. Supply Assigner's proprietary engine is the quickest in terms of rate of running the calculations. Microsoft's Mappoint and ALK's PC*Miler are the other alternatives supported at this time. Included in both these options is the ability to use air distances and actual road distances. Air distances are calculated at a faster rate than the road distances. Using Mappoint or PC*Miler and its add-ons will also provide mapping and geocoding capabilities. Nodes and assignments can be displayed in a map window when using these tools.

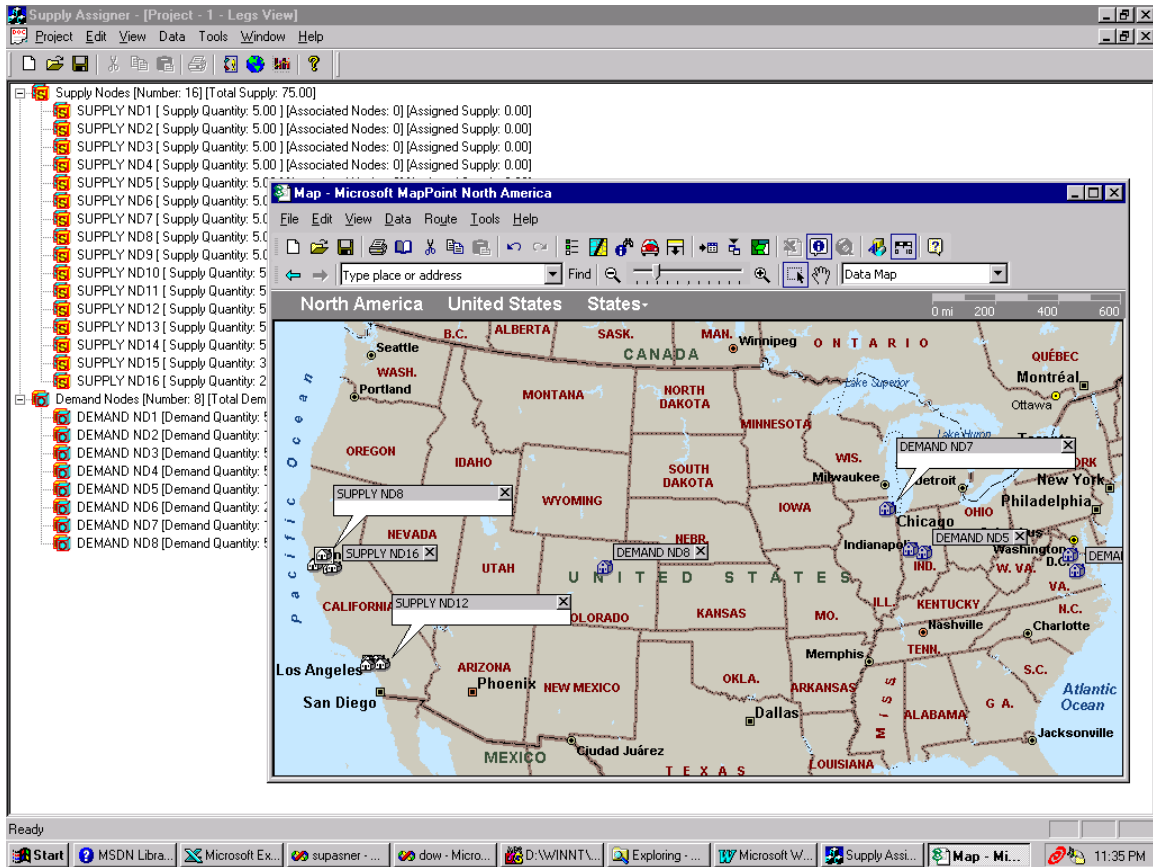
Solution and Presentation

Parameters and Calculation engine settings control the solution. The resulting assignments are presented in the form of spreadsheets and reports. The reports can be exported as text files and customized in MS Word or MS Excel.

The main window of the application provides the drill down capability to locate the required Supply or Demand Node and understand how it is using its supply/demand quantity and its assignments to other Nodes.



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REPORTS & EXPORTS

Assignments can be exported in the form of text files. These reports consist of detailed information on all the assignments generated by the algorithm and can be imported into MS Word or MS Excel for further configuration.

Sample Export

The Matrix view of assignments provides a quick snapshot of the utilization of the supply quantity at each sourcing location and fulfillment details of each demand location. In this view each Supply location is displayed as a row and each Demand location is displayed as a column. Each cell in the matrix is either 0 or a positive number. If the value of a cell is 0 it implies that the Demand location corresponding to the column of the cell is not being sourced from the Supply location that corresponds to the row of the cell. A positive number in a cell indicates the quantity of demand fulfilled by the Supply location that corresponds to the row of the cell for the Demand location corresponding to the column of the cell.

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The screenshot shows the 'Supply Assigner - [Project - 2 - Assignments View (2)]' window. The main area is a grid with columns labeled 'Supply Node' and 'DEMAND 1' through 'DEMAND 16'. The rows are numbered 1 through 36, representing different supply nodes. The data in the grid shows various values for each supply node across the demand nodes. For example, Supply Node 12 has a value of 9.00 for Demand 2 through Demand 9, and 7.00 for Demand 13, and 35.00 for Demand 14. Supply Node 18 has a value of 1.00 for Demand 1 through Demand 16. Supply Node 20 has a value of 10.00 for Demand 4 through Demand 10, 5.00 for Demand 11 and 12, and 1.00 for Demand 16. Supply Node 22 has a value of 1.00 for Demand 2, 1.00 for Demand 3, 1.00 for Demand 4, 1.00 for Demand 5, 1.00 for Demand 6, 4.00 for Demand 7, and 4.00 for Demand 8. Supply Node 24 has a value of 7.00 for Demand 11, 7.00 for Demand 12, 7.00 for Demand 13, 7.00 for Demand 14, and 7.00 for Demand 15. Supply Node 25 has a value of 7.00 for Demand 11, 7.00 for Demand 12, 7.00 for Demand 13, 7.00 for Demand 14, and 7.00 for Demand 15. Supply Node 28 has a value of 17.00 for Demand 11, 17.00 for Demand 12, 17.00 for Demand 13, 17.00 for Demand 14, and 17.00 for Demand 15. Supply Node 29 has a value of 1.00 for Demand 11, 1.00 for Demand 12, 1.00 for Demand 13, 1.00 for Demand 14, and 1.00 for Demand 15. Supply Node 30 has a value of 6.00 for Demand 11, 6.00 for Demand 12, 6.00 for Demand 13, 6.00 for Demand 14, and 6.00 for Demand 15. Supply Node 31 has a value of 3.00 for Demand 11, 3.00 for Demand 12, 3.00 for Demand 13, 3.00 for Demand 14, and 3.00 for Demand 15. Supply Node 32 has a value of 4.00 for Demand 11, 4.00 for Demand 12, 4.00 for Demand 13, 4.00 for Demand 14, and 4.00 for Demand 15. The status bar at the bottom shows 'Ready' and 'CAP'.

Supply Node	DEMAND 1	DEMAND 2	DEMAND 3	DEMAND 4	DEMAND 5	DEMAND 6	DEMAND 7	DEMAND 8	DEMAND 9	DEMAND 10	DEMAND 11	DEMAND 12	DEMAND 13	DEMAND 14	DEMAND 15	DEMAND 16
1 SUPPLY 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 SUPPLY 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 SUPPLY 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 SUPPLY 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 SUPPLY 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 SUPPLY 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 SUPPLY 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 SUPPLY 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 SUPPLY 9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 SUPPLY 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 SUPPLY 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 SUPPLY 12	0	0	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	7.00	35.00	35.00	0
13 SUPPLY 13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 SUPPLY 14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 SUPPLY 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 SUPPLY 16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 SUPPLY 17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 SUPPLY 18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
19 SUPPLY 19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 SUPPLY 20	0	0	0	10.00	10.00	10.00	10.00	10.00	10.00	10.00	5.00	5.00	5.00	5.00	1.00	0
21 SUPPLY 21	0	0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	20.00	20.00	20.00	20.00	20.00	20.00
22 SUPPLY 22	0	1.00	1.00	1.00	1.00	1.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
23 SUPPLY 23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24 SUPPLY 24	0	0	0	0	0	0	0	0	0	0	7.00	7.00	7.00	7.00	7.00	7.00
25 SUPPLY 25	0	0	0	0	0	0	0	0	0	0	7.00	7.00	7.00	7.00	7.00	7.00
26 SUPPLY 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27 SUPPLY 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28 SUPPLY 28	0	0	0	0	0	0	0	0	0	17.00	17.00	17.00	17.00	17.00	17.00	17.00
29 SUPPLY 29	0	0	0	0	0	0	0	0	0	0	1.00	1.00	1.00	1.00	1.00	1.00
30 SUPPLY 30	0	0	0	0	0	0	0	0	0	0	6.00	6.00	6.00	6.00	6.00	6.00
31 SUPPLY 31	0	0	0	0	0	0	0	0	0	3.00	3.00	3.00	3.00	3.00	3.00	3.00
32 SUPPLY 32	0	0	0	0	0	0	0	0	0	0	4.00	4.00	4.00	4.00	4.00	4.00
33 SUPPLY 33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34 SUPPLY 34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35 SUPPLY 35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36 SUPPLY 36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SUMMARY STATISTICS

Supply Assigner provides a statistical summary of the solution each time the assignment engine is executed.

The screenshot shows a dialog box titled 'Summary Statistics' with a close button (X) in the top right corner. The dialog contains the following information:

Number of Supply Nodes	41
Number of Demand Nodes	87
Total Demand	520.00
Total Supply	520.00
Total Assignment Cost	145463.00

At the bottom of the dialog is an 'OK' button.

Supply Assigner Product Description

TECHNOLOGY

Developed in Visual C++ using Object Oriented Design (OOD) methodology and Component Object Model (COM) concepts. Uses industry standard STL (Standard Template Libraries) and streaming techniques for efficient data storage, retrieval, and persistence. Supply Assigner does not require any database drivers or software.

KEY FEATURES & BENEFITS

- Supply Assigner can be packaged as a Windows application with required GUI or used as a Windows DLL with the required APIs.
- Supply Assigner can be used as an operational decision support tool for matching available supply to required demand in the most optimal manner. It can handle any number of supply and demand nodes.
- Familiar user friendly interfaces facilitating shorter learning curve. Problem set up is quick and easy, requiring minimal data entry.
- Industry standard distances and times used for cost estimation.
- Technical architecture is based on Object Oriented design principles, which enable plug and play of functionality.
- Comprehensive reports and exports of data and solution.
- Runs in Windows 95/98/ME/XP/NT/2000 environments

For Pricing Information Please Call Toll Free: 888-713-2245

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