# Transportation Problem Using QM

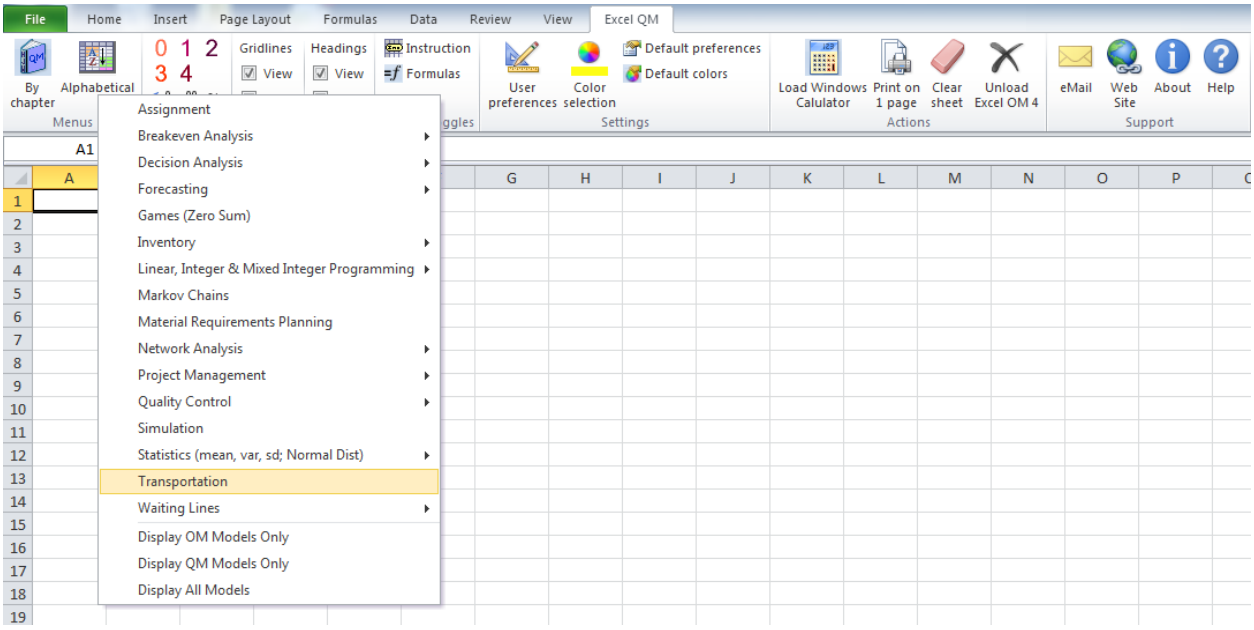
In this tutorial, we will solve a transportation problem using linear programming problem with Excel QM. Finnish Furniture manufactures tables in facilities located in three cities: Reno, Denver, and Pittsburgh. The tables are then shipped to three retail stores in Phoenix, Cleveland, and Chicago. Management wishes to develop a distribution schedule that will meet the demands at the lowest possible cost. The shipping cost per unit from each source to each destination is shown in the following table:

| From \ To | Phoenix | Cleveland | Chicago |
|---|---|---|---|
| Reno | 10 | 16 | 19 |
| Denver | 12 | 14 | 13 |
| Pittsburgh | 18 | 12 | 12 |

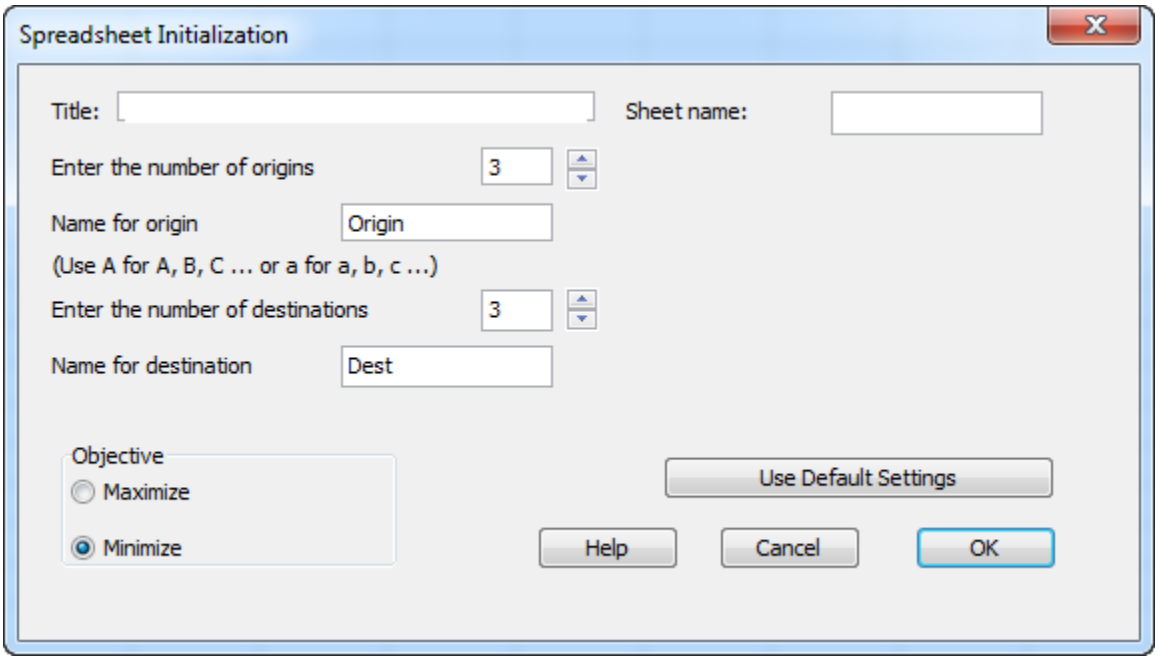
The available supplies are 120 units from Reno, 200 from Denver, and 160 from Pittsburgh.

The demands of each retail store are: Phoenix has 140; Cleveland has 160; Chicago has 180.

Now, let's open Excel QM and solve our problem. Click on the **Excel QM** tab → **Alphabetical** → **Transportation**.



In the Spreadsheet Initialization window, be sure to identify that we have three origins and three destinations and we want to minimize our costs.




Click **OK**. A spreadsheet will display.

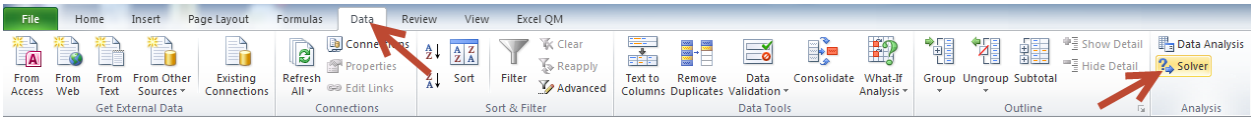
| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | **Transportation** | | | | |
| 2 | | Enter the transportation data in the shaded area. Then go to the DATA Tab on the ribbon, click on Solver in the Data Analysis Group and then click SOLVE. | | | |
| 3 | | If SOLVER is not on the Data Tab then please see the Help file (Solver) for instructions. | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | Data | | | | |
| 7 | COSTS | Dest 1 | Dest 2 | Dest 3 | Supply |
| 8 | Origin 1 | | | | |
| 9 | Origin 2 | | | | |
| 10 | Origin 3 | | | | |
| 11 | Demand | | | | 0 \ 0 |
| 12 | | | | | |
| 13 | **Shipments** | | | | |
| 14 | **Shipments** | **Dest 1** | **Dest 2** | **Dest 3** | **Row Total** |
| 15 | **Origin 1** | | | | **0** |
| 16 | **Origin 2** | | | | **0** |
| 17 | **Origin 3** | | | | **0** |
| 18 | **Column Total** | **0** | **0** | **0** | **0 \ 0** |
| 19 | | | | | |
| 20 | **Total Cost** | **0** | | | |
| 21 | | | | | |

Enter the data shown above into the spreadsheet table.

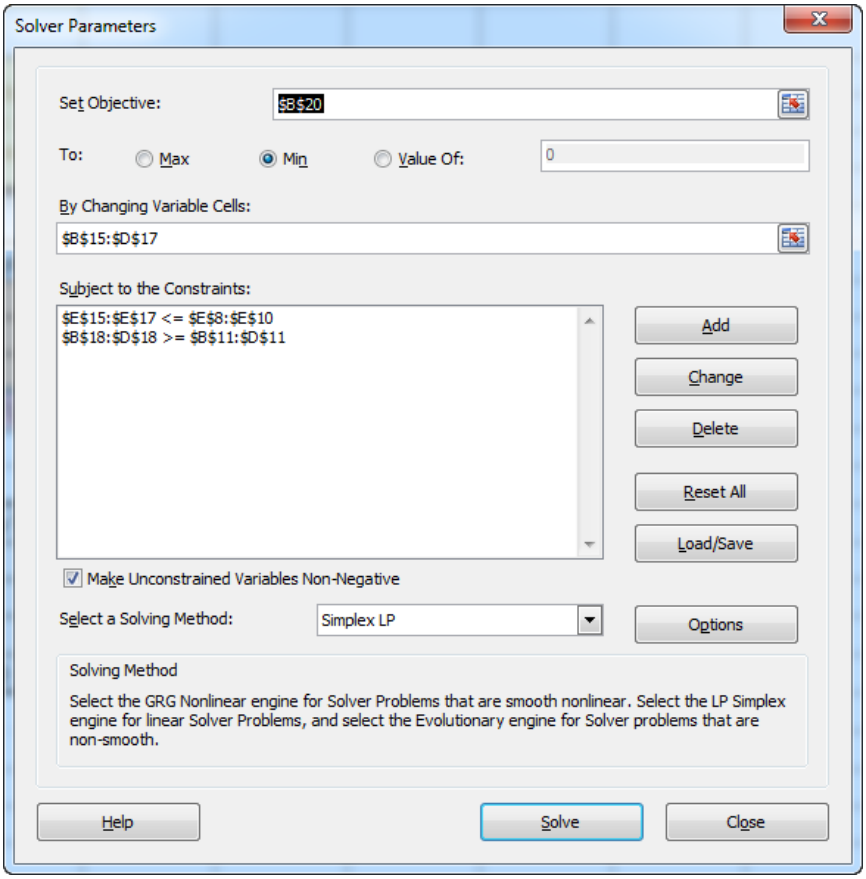
| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | **Transportation** | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | **Data** | | | | |
| 7 | COSTS | Phoenix | Cleveland | Chicago | Supply |
| 8 | Reno | 10 | 16 | 19 | 120 |
| 9 | Denver | 12 | 14 | 13 | 200 |
| 10 | Pittsburgh | 18 | 12 | 12 | 160 |
| 11 | Demand | 140 | 160 | 180 | 480 \ 480 |
| 12 | | | | | |
| 13 | **Shipments** | | | | |
| 14 | **Shipments** | **Phoenix** | **Cleveland** | **Chicago** | **Row Total** |
| 15 | **Reno** | | | | 0 |
| 16 | **Denver** | | | | 0 |
| 17 | **Pittsburgh** | | | | 0 |
| 18 | **Column Total** | 0 | 0 | 0 | 0 \ 0 |
| 19 | | | | | |
| 20 | **Total Cost** | 0 | | | |
| 21 | | | | | |

Enter the transportation data in the shaded area. Then go to the DATA Tab on the ribbon, click on Solver in the Data Analysis Group and then click SOLVE.
If SOLVER is not on the Data Tab then please see the Help file (Solver) for instructions.

Once you have the data entered correctly, click the **Data** tab and then **Solver**.



A Solver Parameters window will appear.




Click **Solve** and then **OK** in the **Solver Results** window. Our results are shown on the next page.

| Data | | | | |
|---|---|---|---|---|
| COSTS | Phoenix | Cleveland | Chicago | Supply |
| Reno | 10 | 16 | 19 | 120 |
| Denver | 12 | 14 | 13 | 200 |
| Pittsburgh | 18 | 12 | 12 | 160 |
| Demand | 140 | 160 | 180 | 480 \ 480 |

| Shipments | | | | |
|---|---|---|---|---|
| Shipments | Phoenix | Cleveland | Chicago | Row Total |
| Reno | 120 | | | 120 |
| Denver | 20 | | 180 | 200 |
| Pittsburgh | | 160 | | 160 |
| Column Total | 140 | 160 | 180 | 480 \ 480 |

| Total Cost | 5700 |
|---|---|

The optimal solution found using computer software for the transportation algorithm is to ship 120 from Reno to Phoenix, 20 from Denver to Phoenix, 160 from Pittsburgh to Cleveland, and 180 from Denver to Chicago. The total cost is $5,700. Click here to download the completed spreadsheet table so you can compare it to yours.

This concludes our tutorial on solving a transportation problem using linear programming problem with Excel QM.