Hands On

This handson will be graded and used to determine your final grade for the AGEC 641- Lab session. Please turn it in by April 21. Individual work is expected. If you have questions or face problems with this handson, please do not hesitate to send me an email or come by my office any time.

The Objectives are to achieve an understanding of the following:

1. Applied GAMS formulation and Its Power

2. Good modeling practices

3. GAMSCHK usage

4. Comparative analysis

5. Report writing

Things to Do:

(1). Run the handson.gms and observe your results. What do you find?

(2). Use Pre/Post -solution GAMSCHK procedures such as PICTURE, BLOCKPIC, POSTOPT, NONOPT, etc. to check for any flaws in the model structure. If there are flaws, please correct them and give explanations on how you found and corrected them.

(3). Do a comparative analysis on the corrected model using the LOOP procedure. Your model should be able to solve over a number of alternative price scenarios as given below.

```
TABLE  NewPrice(Product, Grade, Scenario)    New price used in scenarios
                                     BASE       PriceUp
          CHAIRS  .FUNCTIONAL         82          82
          TABLES  .FUNCTIONAL        450         450
          DINSETS.FUNCTIONAL        1200        2000
          CHAIRS  .FANCY             105         105
          TABLES  .FANCY             600         600
          DINSETS.FANCY            1600        1600
     ;
```

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(4).   Construct a comparative report similar to the following

```
----      152 PARAMETER Report  Report summary on shipping cost
                                               BASE        PriceUp


  TABLES       .FUNCTIONAL.PLANT1      .PLANT2.Volume
  TABLES       .FUNCTIONAL.PLANT1      .PLANT2.CostPerUnit
  TABLES       .FUNCTIONAL.PLANT1      .PLANT2.TotalCost

   .....
```

Hint: **1.   Create a 6 dimensional table**

2.   The first dimension will contain the product name.

3.   The second will contain the grade.

4.   The third and fourth will contain the product supply and demand locations

5.   The fifth is a miscellaneous group of items with the first column having the optimal amount shipped between all points, the second the cost of shipping from the objective function and the third the cost times volume

6.   The sixth represents scenarios.

(5).   Make sure that you apply good modeling practices to your model.

Model description:

This model has three basic types of variables.

MAKE(PLANT,Process,grade) Number of units of a particular manufacturing process that are employed to make items of a particular grade

TRNSPORT(PLANT,PLANTs,PRODUCT,grade) Number of units of a product of a particular grade transported from a plant to another plant (plants)

SELL(plant,product,grade) Number of items sold at a plant of a particular product and grade

Products (chairs, tables and dining sets) of two different grades are made at two plants then transported and sold. The furniture can be of a fine or fancy grade. Dining sets are assembled from chairs and tables. All production is accounted for in 1000 units.

Three processes are used (makechair, maketable, and makedinset). The process yield data reflects the use of tables and chairs as intermediate inputs as in the table given in the program.

Note dining set manufacture produces negative amounts of chairs and tables and positive sets indicating use of the chairs and tables to make a set.