# Homework #9

This is an individual assignment. All work that you submit for credit must be your own.

1. Twenty-eight graduate students in a case study consulting course must be assigned to work together in a team of four students on one of seven projects. Each student is assigned to a single project, and each project must be assigned four students. The students in the course have been surveyed to indicate their level of preference/interest for each of the projects with 5 indicating a strong preference for a project and 1 indicating a low preference. The student-project preference data is provided in the file `project_data.ipynb`. Construct an optimization model for this problem in a Jupyter Notebook, and use it to find an optimal solution.

2. Tri-County Utilities supplies natural gas to customers in a three county area. The company purchases natural gas from two suppliers: Southern Gas and Northwest Gas. Demand forecasts for the coming winter season are as follows: Hamilton County 400 units, Butler County 200 units, and Clermont County 300 units. Tri-County Utilities has contracted with Southern Gas to provide 500 units and with Northwest Gas to provide 400 units. The distribution cost per unit from each supplier to each county are given in the table below.

| | County | | |
|---|---|---|---|
| Supplier | Hamilton | Butler | Clermont |
| Southern Gas | 10 | 20 | 15 |
| Northwest Gas | 12 | 15 | 18 |

   a. Construct an optimization model for this problem in a Jupyter Notebook, and use it to find an optimal solution.

   b. Recent growth in Butler County has the potential to increase demand in that county by 100 units. With which supplier should Tri-County contract to provide the additional gas to meet this increased demand?