**Mathematics of Industry and Government**

# Linear Programming Project UNIT 4

Objective:

* Your previous project had you develop a business that made some products that carried with them constraints. This time you will be given a sheet of maximization and minimization problems from which you will choose one of each.
* In the past I’ve given you word problems and had you translate them into Linear Programming problems to solve with Excel. Now, I’m going to give you the LP problems and have you develop the word problems.

* For the two problems that you choose you must do the following.
  + Create an excel file saved under the title: ***Unit4\_Project2\_YourLastName.xlsx***
  + Apply the Solver to determine the Optimal Solution and the Minimum/Maximum Value (depending on the problem) for the two that you have chosen.
  + Create an Answer Report for each problem.
  + Create TWO real world problems that could connect to your chosen two problems.
  + Create ONE Prezi that puts all of this information together.

Requirements:

At minimum, your Prezi must include:

1. Your group:
   * You may have only one partner per group. However, any group member that is absent more than 2 days will be removed from the group and given the alternative assessment.
   * Additionally, any group that is addressed for conduct three times will be split up and possibly given the alternative assignment.
   * Make sure you share your Prezi login with your partners in the event that one is absent. Additionally, save the Excel file to both of your student numbers at the end of each day.
2. Your real world connection
   * A real world example that corresponds with your two chosen problems (one maximization and one minimization). Must define what your decision variables are how your example connects to the constraints and the objective function.
3. Your Answer Report.
   * Using the answer report, you need to determine which constraints are binding and which are not. Additionally, you should determine the slack on the non-binding constraints and explain what this means in terms of your real world connection.

Grading:

This project will count as a test grade. And will be broken down by the following:

80% - By the teacher

20% - By your partners

Follow the guidelines on the rubrics on the next page for more specific grading information. Notice that appearance, creativity, and other extras affect your grade!

Alternative Assignment:

A test consisting of:

* Vocabulary section
* Writing LP problems as equations and inequalities
* Solving LP problems with the computer
* Solving word problems using the computer.
* Essay portion dealing with how to solve LP problems in the general case.

**Grading Rubric:**

**TEACHER – 80% of the total grade**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Answers to the Problems**  (20 points) | Max and Min answers are correct with no errors  (20) | Max and Min answers are correct with some errors  (15) | Either the Max or Min answers are wrong, but the other is correct  (10) | Both problems are wrong.  (0) |
| **Answer Report**  (15 points) | Screenshot of the Answer Report is included with ALL contexts included AND a FULL explanation of its connection  (15) | Screenshot of the Answer Report is included WITHOUT SOME contexts included OR a PARTIAL explanation of its connection  (8) | Screenshot of the Answer Report is included WITHOUT SOME contexts included OR a PARTIAL explanation of its connection  (5) | What’s an Answer Report?    (0) |
| **Screen Shot of Spreadsheet and Answer Report**  (10 points) | The excel file has ALL the correct contexts for the objective function, the decision variables and the constraints  (10) | The excel file has SOME of the correct contexts for the objective function, the decision variables and the constraints  (7) | The excel file has NONE of the correct contexts for the objective function, the decision variables and the constraints  (4) | What’s a screen shot?  (0) |
| **Realism**  (15 points) | Students went out of their way to connect their problems to the real world.  (15) | Students connection fits their problems but lacks a good explanation  (8) | Students connection does not fit their problems but there is an explanation  (5) | You should be ashamed    (0) |
| **Difficulty**  (15 points) | Students chose two problems with three or more constraints  (15) | Students chose one problem with three or more constraints and the other with two.  (10) | Students chose two problems with two constraints  (5) | Students chose only one problem  (0) |
| **Creativity**  (10 points) | Students took full advantage of Prezi’s animation AND did not use a template.  (10) | Students took full advantage of Prezi’s animation OR did not use a template.  (8) | Students used Prezi but showed they did the bare minimum  (6) | You should be ashamed  (0) |

**PARTNER’S EVALUATION – 20% of the total grade**

|  |  |  |  |
| --- | --- | --- | --- |
|  | He/She did this very well.  (4) | This was okay.  (2) | My partner let me down.  (0) |
| My partner made a lot of good suggestion. |  |  |  |
| My partner was on task for the majority of the time we worked together. |  |  |  |
| My partner was open to my suggestions. |  |  |  |
| My partner knew what was expected of him/her. |  |  |  |
| I was able to complete the project effectively as a result of working with my partner. |  |  |  |

**Choose ONE of the Maximization problems and ONE of the Minimization problems.**

**Max problems**



**Min Problems:**

