Data Optimization

Optimization is the mathematical process of finding an ideal (optimal) solution to a resource-constrained problem. This project required a solution to an optimization problem in Excel using the Solver Command. *Solver Command Excel: Part of the analysis group on the data tab.*

*Optimization Presentation:* [**https://new.express.adobe.com/webpage/design/urn:aaid:sc:VA6C2:3a60acac-ebde-4629-b8fb-657980f18516?category=photos**](https://new.express.adobe.com/webpage/design/urn:aaid:sc:VA6C2:3a60acac-ebde-4629-b8fb-657980f18516?category=photos)

**First Problem:** Electronic equipment

An electronics company produces three products: LCD TVs, Stereos and Speakers.

Here is the breakdown of what parts are required to produce each product:

|  |  |  |  |
| --- | --- | --- | --- |
| **Parts required to produce each product:**  Organized by Product | | | |
| **Part Name** | **LCD TVs** | **Stereos** | **Speakers** |
| Chassis | 1 | 1 | 0 |
| LCD Screen | 1 | 0 | 0 |
| Speakers | 2 | 2 | 1 |
| Power Supply | 1 | 1 | 0 |
| Electronics | 2 | 1 | 1 |

Here's what they have in inventory for each part:

|  |  |
| --- | --- |
| **Inventory Available for Each Part** | |
| **Part Name** | **Number available** |
| Chassis | 450 |
| LCD Screen | 250 |
| Speakers | 800 |
| Power Supply | 450 |
| Electronics | 600 |

Here is the profit per unit for each product:

|  |  |  |  |
| --- | --- | --- | --- |
| **profit per unit for each product ($):** | | | |
|  | LCD TVs | Stereos | Speakers |
| Profit per Unit | 75 | 50 | 35 |

We want to maximize profit and use as much of our parts inventory as possible. A solution will tell us how many of each product to produce.

Each solver add-on has a tutorial available. After you install the add-on, run through the tutorial to familiarize yourself with the tool, then solve the above problem.

How many of each product should the company produce to maximize its profits using available parts inventory?

***Answe****r:*

|  |  |  |  |
| --- | --- | --- | --- |
| Product | LCD TVs | Stereos | Speakers |
| Quantity | 200 | 200 | 0 |

*Excel spreadsheet and solver was used to find solutions*

***Pictures of Spreadsheet and Solver part 1:***

*A white grid with many small black dots

AI-generated content may be incorrect.*

A screenshot of a computer

AI-generated content may be incorrect.

**Second Problem:** Variable-based problem

The optimization problem to solve is:

**Find the maximal AND minimal value of**

**z = 3x + 4y**

**With the following constraints:**

**x + 2y <= 14, 3x - y >= 0, x - y <= 2**

Maximum when X= 6 and Y=4

**z = 3(6) + 4(4)=34**

Minimum when X= -1 and Y=-3

**z = 3(-1) + 4(-3)=-15**

*Excel spreadsheet and solver was used to find solutions*

***Pictures of Spreadsheet and Solver part 2:***



