Formulate the problem described here as a linear programming model. Do not use Solver to find an optimal solution. You can use WORD to type your answer and print it.

You are planning production of trucks and cars in a plant over next two months (M1 and M2). Use X1 and X2 to denote number of trucks produced in M1 and M2; UseY1 and Y2 for cars produced. At the end of each month, there may be inventory of vehicles. Use U1 and U2 for truck inventory and V1, V2 for car inventory. Note that there are 8 variables in the problem. Technically, variable names make use of subscripts; you can use these without subscripts (makes it easier to type).

**Ignore integer constraints. Make sure that all variables in the constraints appear on the LHS and only numbers appear on the RHS. Here is the information you need.**

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| --- | --- | --- |
| **Production costs** | M1 | M2 |
| Truck | 15000 | 15200 |
| Car | 12500 | 12600 |

|  |  |  |
| --- | --- | --- |
| **Inventory holding costs** | M1 | M2 |
| Truck | 150 | 155 |
| Car | 120 | 125 |

|  |  |  |
| --- | --- | --- |
| **Demand** | M1 | M2 |
| Truck | 450 | 300 |
| Car | 400 | 600 |

**Demand must be met (i.e. no shortages at the end of any month).**

|  |  |  |
| --- | --- | --- |
| **Steel (Tons/unit)** | M1 | M2 |
| Truck | 2 | 2 |
| Car | 1 | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Available steel (tons)** | | M1  2500 | M2  2200 |
| **Initial inventory (units)** | Trucks  100 | | Cars  150 |
| **Miles per gallon (mpg)** | Trucks  10 | | Cars  20 |

**Number of trucks and cars produced in any month should be such that the average consumption exceeds 16 mpg.**

**Explain how you obtained mpg constraint for M1 (you can write the constraint directly for M2). Explain how you obtained one inventory constraints.**

**Hints:**

* **Objective function should contain production costs and inventory holding costs.**
* **Inventory at the end of a month (for a product) is equal to the inventory at the end of the previous month plus production minus demand for that product.**
* **There are two constraint for mpg, two constraints for steel availability and four constraints for inventory.**